Col
13-1847F
039-00031

REGULATION 13 APPLICATION FOR MODIFICATION OF R13-1874E PLANT ID 039-00031 CHARLESTON FACILITY

Prepared for:

Elementis Specialties, Inc.
1003 MacCorkle Avenue, SW
Charleston, West Virginia 25303

Prepared by:

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Project No. 0101-12-0404

October 2014

POTESTA

Source: 51 Mill
Emission Point I.D.: 10

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-780401

Equipment Information and Filter Characteristics

1. Manufacturer: Mikro-Pulsaire
   Model No. 815-8-20

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.625 in.
   Length 8 ft.

8. Total cloth area: 942 ft^2

9. Number of bags: 81

10. Operating air to cloth ratio: 4.78:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer ☐ Frequency if timer actuated
   ☐ Expected pressure drop range in. of water ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 4,500 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 100 °F

19. Fan Requirements: 75 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5 (emissions include PV-780303)	13.85	NA	0.0138	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9%
2 – 4	8.8	100%
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Change in Emissions

Pollutant	Current Permit Limit (TPY)	Proposed Permit Limit (TPY)	Difference (TPY)
PM*	41.12	14.92	-26.20
PM10	31.20	11.32	-19.88
PM2.5*	28.91	10.49	-18.42
CO	6.83	19.62	12.79
NOx	29.11	23.29	-5.82
SO2	0.16	0.32	0.16
VOC	96.36	90.68	-5.68
Hazardous Air Pollutants			
Methyl Chloride	0.43	0.27	-0.16
HCl	4.6	1.42	-3.18
Benzyl Chloride	0.22	0.22	0.00
Methanol	0	1.15	1.15
HAPS - VOC	0	0.51	0.51
HAPS - Metal	0	0.32	0.32
Total HAPS	5.25	3.89	-1.36

Greenhouse Gas	Current Permit Limit (Metric Tons)	Proposed Permit Limit (Metric Tons)	Difference (TPY)
CO2e	27,257	28,425	1,168

* - Current PM and PM2.5 prorated based on Current PM10 limit and Proposed PM, PM10, and PM2.5 limits. PM and PM2.5 limits were not included in the current permit.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

PTE emissions of the Process with Dry Bentone (EXISTING)

Emission Point ID	Description	NOX	VOC	PM10	SO2	CO
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
8	3x3 RD	0	0.98	0.14	0	0
7-17B	Oxidizer	0.38	11.96	2.28	0.01	0.08
10	Pug Mill/51 Mill	0.1	0.1	0.17	0	0.02
9C	Pug Mill Feed Hopper	0	0	2.5	0	0
7B	St. Line	0	0	0.11	0	0
9A	Silos	0	0	2.5	0	0
9B	Day Bin	0	0	2.5	0	0
13	North DC	0	0	0.16	0	0
009	FBD Pack	0	0	0.16	0	0
2A	Dispersion Batch Tanks	0	0.08	0.08	0	0
2	Rx and Disp Tanks	0	0	0.08	0	0
3	Flash Dryer	1.4	5.45	0.46	0.01	0.35
5	AC #2	0	0	0.12	0	0
18	Kewanee Boiler	3.33	0.07	0.12	0.01	0.83
19	Gas Heater	0.01	neg.	neg.	neg.	neg.
20	Reagant	0	0	neg.	0	0
007	WRD	0	1.16	0.14	0	0
008	ERD	0	1.16	0.14	0	0
16	AC #1	0	0	0.12	0	0
17B	GIMCO B	0	0	0.11	0	0
017	West 1st Stage	0.5	0.61	0.06	neg.	0.1
018	West 2nd Stage	0.5	0.61	0.06	neg.	0.1
019	East 1st Stage	0.5	0.61	0.06	neg.	0.1
020	East 2nd Stage	0.5	0.61	0.06	neg.	0.1
28	Quat Tank	0	0	0	0	0
29	Quat Tank	0	0	0	0	0
30	Quat Tank	0	0	0	0	0
32	Quat Tank	0	0	0	0	0
33	Quat Tank	0	0	0	0	0
34	Quat Tank	0	0	0	0	0
36	Central Vac	0	0	neg.	0	0
40	Bulk Sack Packer	0	0	0.07	0	0
		7.22	23.40	12.20	0.03	1.68

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

PTE emissions of the Process with Dry Bentone (EXISTING)

Emission Point ID	Description	NOX	VOC	PM10	SO2	CO
		TPY	TPY	TPY	TPY	TPY
8	3x3 RD	0	4.12	0.54	0	0
7-17B	Oxidizer	1.6	50.22	9.58	0.03	0.34
10	Pug Mill/51 Mill	0.4	0.4	0.69	0	0.08
9C	Pug Mill Feed Hopper	0	0	9.9	0	0
7B	St. Line	0	0	0.46	0	0
9A	Silos	0	0	0.88	0	0
9B	Day Bin	0	0	0.88	0	0
13	North DC	0	0	0.67	0	0
009	FBD Pack	0	0	0.67	0	0
2A	Dispersion Batch Tanks	0	0.34	0.34	0	0
2	Rx and Disp Tanks	0	0	0.34	0	0
3	Flash Dryer	5.88	23.87	1.93	0.03	1.47
5	AC #2	0	0	0.5	0	0
18	Kewanee Boiler	13.99	0.29	0.5	0.06	3.49
19	Gas Heater	0.04	neg.	neg.	neg.	0.01
20	Reagant	0	0	neg.	0	0
007	WRD	0	4.16	0.59	0	0
008	ERD	0	4.16	0.59	0	0
16	AC #1	0	0	0.5	0	0
17B	GIMCO B	0	0	0.46	0	0
017	West 1st Stage	1.8	2.2	0.22	0.01	0.36
018	West 2nd Stage	1.8	2.2	0.22	0.01	0.36
019	East 1st Stage	1.8	2.2	0.22	0.01	0.36
020	East 2nd Stage	1.8	2.2	0.22	0.01	0.36
28	Quat Tank	0	0	0	0	0
29	Quat Tank	0	0	0	0	0
30	Quat Tank	0	0	0	0	0
32	Quat Tank	0	0	0	0	0
33	Quat Tank	0	0	0	0	0
34	Quat Tank	0	0	0	0	0
36	Central Vac	0	0	neg.	0	0
40	Bulk Sack Packer	0	0	0.3	0	0
		29.11	96.36	31.20	0.16	6.83

Hazardous Air Pollutants Emissions

Emission Point ID	Description	Methyl Chloride		HCl		Benzyl Chloride	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
7-17B	Oxidizer	0.08	0.34	1.1	4.6	0	0
2	Rx and Disp Tanks	0.03	0.09	0	0	0.05	0.22

Based on R13-1847E

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Revised Emissions (Controlled)

Emission Point ID	Description	NOX	VOC	PM	PM10	PM2.5	SO2	CO
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
8	3x3 RD	~~0~~	~~0.98~~	~~0.14~~			~~0~~	~~0~~
7-17B	Oxidizer	0.29	8.55	0.02	0.02	0.02	0.01	0.25
10	Pug Mill/51 Mill	0	0	0.0138	0.0138	0.0138	0	0
9C	Pug Mill Feed Hopper	0	0	0.0069	0.0069	0.0069	0	0
7B	St. Line	0	0	0.18	0.18	0.18	0	0
9A	Silos	0	0	0.0785	0.0785	0.0785	0	0
9B	Day Bin	0	0	0.0785	0.0785	0.0785	0	0
13	Haver A Packer	0	0	0.0058	0.0058	0.0058	0	0
009	Haver C Packer	0	0	0.0069	0.0069	0.0069	0	0
2A	Dispersion Batch Tanks	0	0	0.08	0.08	0.08	0	0
2	Rx and Disp Tanks	0	0	0.08	0.08	0.08	0	0
3	Flash Dryer	0.98	3.06	0.44	0.44	0.44	0.01	0.82
5	ACM #2	0	0	0.0058	0.0058	0.0058	0	0
18	Kewanee Boiler	1.97	0.11	0.15	0.15	0.15	0.01	1.65
19	Gas Heater	0.04	0.01	0.01	0.01	0.01	0.01	0.04
20	Anion Addition	0	0	0.0063	0.0063	0.0063	0	0
007	West Rotary Vacuum Filter Vent	0	0.78	0.10	0.10	0.10	0	0
008	East Rotary Vacuum Filter Vent	0	0.78	0.10	0.10	0.10	0	0
16	ACM #1	0	0	0.0058	0.0058	0.0058	0	0
17B	Eimco Filter B	0	0	0.18	0.18	0.18	0	0
17C	Eimco Filter C	0	0	0.21	0.21	0.21	0	0
50	Parkson C	0	0	0.21	0.21	0.21	0	0
017	West 1st Stage	0.51	0.81	0.13	0.13	0.13	0.01	0.43
018	West 2nd Stage	0.51	0.81	0.13	0.13	0.13	0.01	0.43
019	East 1st Stage	0.51	0.81	0.13	0.13	0.13	0.01	0.43
020	East 2nd Stage	0.51	0.81	0.13	0.13	0.13	0.01	0.43
28	Quat Tank	0	0.01	0	0	0	0	0
29	Quat Tank	0	0.01	0	0	0	0	0
30	Quat Tank	0	0.01	0	0	0	0	0
32	Quat Tank	0	0.01	0	0	0	0	0
33	Quat Tank	0	0.02	0	0	0	0	0
34	Quat Tank	0	0.02	0	0	0	0	0
36	Central Vac	0	0	neg.	neg.	neg.	0	0
40	Bulk Sack Packer	0	0	0.0047	0.0047	0.0047	0	0
41	AC1 Bin Vent	0	0	0.0058	0.0058	0.0058	0	0
42	AC2 Bin Vent	0	0	0.0058	0.0058	0.0058	0	0
43	51 Recycle Bin	0	0	0.0069	0.0069	0.0069	0	0
44	Haver A Hopper	0	0	0.0058	0.0058	0.0058	0	0
45	Dump Station A	0	0	0.0058	0.0058	0.0058	0	0
46	Dump Station C	0	0	0.0063	0.0063	0.0063	0	0
47	Haver C Packing Hopper	0	0	0.0069	0.0069	0.0069	0	0
48	CO2 transfer system							
49	Long Conveyor -Torrit	0	0	0.0058	0.0058	0.0058	0	0
Fugitive	Fugitive		3.82					
WWTP	WWTP Emissions		11.68					
	Roadways			24.47	4.76	0.17		
	Total	5.32	32.11	27.01	7.30	2.71	0.08	4.48

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Revised Emissions (Controlled)

Emission Point ID	Description	NOX	VOC	PM	PM10	PM2.5	SO2	CO	CO2e
		TPY	TPY	TPY	TPY	TPY	TPY	TPY	Metric Tons
~~8~~	~~3x3 RD~~	~~0~~	~~4.12~~	~~0.54~~			~~0~~	~~0~~	
7-17B	Oxidizer	1.27	15.61	0.09	0.09	0.09	0.04	1.10	1,434
10	Pug Mill/51 Mill	0	0	0.0606	0.0606	0.0606	0	0	0
9C	Pug Mill Feed Hopper	0	0	0.0303	0.0303	0.0303	0	0	
7B	St. Line	0	0	0.77	0.77	0.77	0	0	
9A	Silos	0	0	0.0316	0.0316	0.0316	0	0	
9B	Day Bin	0	0	0.0316	0.0316	0.0316	0	0	
13	Haver A Packer	0	0	0.0253	0.0253	0.0253	0	0	
009	Haver C Packer	0	0	0.0303	0.0303	0.0303	0	0	
2A	Dispersion Batch Tanks	0	0	0.35	0.35	0.35	0	0	
2	Rx and Disp Tanks	0	0	0.35	0.35	0.35	0	0	
3	Flash Dryer	4.29	13.40	1.93	1.93	1.93	0.04	3.59	4,780
5	ACM #2	0	0	0.0253	0.0253	0.0253	0	0	
18	Kewanee Boiler	8.63	0.48	0.66	0.66	0.66	0.04	7.23	9,599
19	Gas Heater	0.18	0.04	0.04	0.04	0.04	0.04	0.18	191
20	Anion Addition	0	0	0.0165	0.0165	0.0165	0	0	
007	WRD	0	3.41	0.45	0.45	0.45	0	0	
008	ERD	0	3.41	0.45	0.45	0.45	0	0	
16	ACM #1	0	0	0.0253	0.0253	0.0253	0	0	
17B	Eimco Filter B	0	0	0.77	0.77	0.77	0	0	
17C	Eimco Filter C	0	0	0.93	0.93	0.93	0	0	
50	Parkson C	0	0	0.93	0.93	0.93	0	0	
017	West 1st Stage	2.23	3.55	0.57	0.57	0.57	0.04	1.88	2,509
018	West 2nd Stage	2.23	3.55	0.57	0.57	0.57	0.04	1.88	2,509
019	East 1st Stage	2.23	3.55	0.57	0.57	0.57	0.04	1.88	2,509
020	East 2nd Stage	2.23	3.55	0.57	0.57	0.57	0.04	1.88	2,509
28	Quat Tank	0	0.05	0	0	0	0	0	
29	Quat Tank	0	0.06	0	0	0	0	0	
30	Quat Tank	0	0.06	0	0	0	0	0	
32	Quat Tank	0	0.05	0	0	0	0	0	
33	Quat Tank	0	0.09	0	0	0	0	0	
34	Quat Tank	0	0.09	0	0	0	0	0	
36	Central Vac	0	0	neg.	neg.	neg.	0	0	
40	Bulk Sack Packer	0	0	0.0206	0.0206	0.0206	0	0	
41	AC1 Bin Vent	0	0	0.0253	0.0253	0.0253	0	0	
42	AC2 Bin Vent	0	0	0.0253	0.0253	0.0253	0	0	
43	51 Recycle Bin	0	0	0.0076	0.0076	0.0076	0	0	
44	Haver A Hopper	0	0	0.0253	0.0253	0.0253	0	0	
45	Dump Station A	0	0	0.0063	0.0063	0.0063	0	0	
46	Dump Station C	0	0	0.0069	0.0069	0.0069	0	0	
47	Haver C Packing Hopper	0	0	0.0303	0.0303	0.0303	0	0	
48	CO2 transfer system								2,384
49	Long Conveyor -Torrit	0	0	0.0253	0.0253	0.0253	0	0	
Fugitive	Fugitive		16.73						
WWTP	WWTP Emissions		23.00						
	Roadways			4.47	0.87	0.04			
	Total	23.29	90.68	14.92	11.32	10.49	0.32	19.62	28,425

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Revised Emissions (Controlled)

Hazardous Air Pollutants Emissions

Emission Point ID	Description	Methyl Chloride	HCl	Benzyl Chloride	Methanol	HAPS VOC	HAPS METAL	Total HAPS
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
7-17B	Oxidizer	0.06	0.65			0.01	0.01	0.73
2	Rx and Disp Tanks	0.03		0.05				0.08
3	Flash Dryer					0.02	0.01	0.03
18	Kewanee Boiler					0.04	0.01	0.05
19	Gas Heater					0.01	0.01	0.02
017	W 1st					0.01	0.01	0.02
018	W 2nd					0.01	0.01	0.02
019	E 1st					0.01	0.01	0.02
020	E 2nd					0.01	0.01	0.02
WWTP	WWTP Secondary Emissions				3.18			3.18
	Total	0.09	0.65	0.05	3.18	0.12	0.08	4.17

Emission Point ID	Description	Methyl Chloride	HCl	Benzyl Chloride	Methanol	HAPS VOC	HAPS METAL	Total HAPS
		TPY	TPY	TPY	TPY	TPY	TPY	TPY
7-17B	Oxidizer	0.14	1.42			0.04	0.04	1.64
2	Rx and Disp Tanks	0.13		0.22				0.35
3	Flash Dryer					0.09	0.04	0.13
18	Kewanee Boiler					0.18	0.04	0.22
19	Gas Heater					0.04	0.04	0.08
017	W 1st					0.04	0.04	0.08
018	W 2nd					0.04	0.04	0.08
019	E 1st					0.04	0.04	0.08
020	E 2nd					0.04	0.04	0.08
WWTP	WWTP Secondary Emissions				1.15			1.15
	Total	0.27	1.42	0.22	1.15	0.51	0.32	3.89

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Source	Carbon Dioxide (Metric Tons)	Methane (Metric Tons)	Nitrous Oxide (Metric Tons)	CO2e (Metric Tons)	CO2e (Short Tons)	Short tons/metric ton
Catalytic Oxidizer	1,432	0.03	0.003	1,434	1,581	1.1023
Flash Dryer	4,775	0.09	0.01	4,780	5,268	
Kewanee Boiler	9,590	0.18	0.02	9,599	10,581	
Gas Fired Heater Vent	191	0.00	0.0004	191	210	
West 1st Stage	2,507	0.05	0.005	2,509	2,766	
West 2nd Stage	2,507	0.05	0.005	2,509	2,766	
East 1st Stage	2,507	0.05	0.005	2,509	2,766	
East 2nd Stage	2,507	0.05	0.005	2,509	2,766	
CO2 Process Emissions	2,384	--	--	2,384	2,628	
Total	28,398	0.49	0.05	28,425	31,333	

1 - 1 metric ton = 1.1023 short tons
CO2, Methane and N2O are not over 100,000 metric tons

Emission Unit	CO2 (short tons)	Methane (short tons)	N2O (short tons)
Catalytic Oxidizer	1,579	0.03	0.003
Flash Dryer	5,263	0.10	0.010
Kewanee Boiler	10,571	0.20	0.020
Gas Fired Heater Vent	210	0.00	0.001
West 1st Stage	2,763	0.05	0.005
West 2nd Stage	2,763	0.05	0.005
East 1st Stage	2,763	0.05	0.005
East 2nd Stage	2,763	0.05	0.005
CO2 Process Emissions	2,628	--	--
Total	31,303	0.53	0.054

CO2 emissions are over 100 short tons.

The following emissions estimate is intended to represent emissions of particulate matter and VOC (007 and 008 only) from the operations of the sources with clay or clay based materials throughout the system at Elementis. The emissions are based on an estimated emissions factor that was developed from the permitted emissions limitations of the previous permit revisions. The yearly throughput and emissions are based on 8,760 hours of operation per year. PM, PM10, and PM2.5 are assumed to be equal.

						Emissions (PM, PM10 and PM2.5)				
		Operating Rate			Emission Factor	Uncontrolled		Control Efficiency	Controlled	
Source	Description	pph	tph	tpy	lb/ton	pph	tpy	%	pph	tpy
7B	Straight Line Vacuum Filter Hood	3,675	1.8375	16,097	0.096	0.18	0.77	0	0.18	0.77
007	West Vacuum Filter Vent	2,205	1.1025	9,658	0.093	0.10	0.45	0	0.10	0.45
008	East Vacuum Filter Vent	2,205	1.1025	9,658	0.093	0.10	0.45	0	0.10	0.45
2A	Dispersion BatchTanks	84,000	42	367,920	0.002	0.08	0.35	0	0.08	0.35
2	Rx & Disp. Tank	84,000	42	367,920	0.002	0.08	0.35	0	0.08	0.35
17B	Eimco B Filter Hood Vent	3,675	1.8375	16,097	0.096	0.18	0.77	0	0.18	0.77
17C	Eimco C Filter Hood Vent	4,410	2.205	19,316	0.096	0.21	0.93	0	0.21	0.93
50	Parkson C Filter Hood Vent	4,410	2.205	19,316	0.096	0.21	0.93	0	0.21	0.93

Estimated PM Emissions Factor Based on Past Permit Applications					
Source	Description	Permitted Throughput		Permitted Emission Limit	Emission Factor
		lb/hr	tph	lb/hr	lb/ton
7B	Straight Line Vacuum Filter Hood	2,292	1.146	0.11	0.096
007	West Vacuum Filter Vent	3,000	1.5	0.14	0.093
008	East Vacuum Filter Vent	3,000	1.5	0.14	0.093
2A	Dispersion BatchTanks	84,000	42	0.08	0.002
2	Rx & Disp. Tank	84,000	42	0.08	0.002
17B	Eimco B Filter Hood Vent	2,292	1.146	0.11	0.096
17C	Eimco C Filter Hood Vent	2,292	1.146	0.11	0.096
50	Parkson C Filter Hood Vent	2,292	1.146	0.11	0.096

						Emissions (VOC)				
		Operating Rate			Emission Factor	Uncontrolled		Control Efficiency	Controlled	
Source	Description	pph	tph	tpy	lb/ton	pph	tpy	%	pph	tpy
007	West Vacuum Filter Vent	2,205	1.1025	9,658	0.707	0.78	3.41	0	0.78	3.41
008	East Vacuum Filter Vent	2,205	1.1025	9,658	0.707	0.78	3.41	0	0.78	3.41

Estimated VOC Emissions Factor Based on Past Permit Applications					
Source	Description	Permitted Throughput		Permitted Emission Limit	Emission Factor
		lb/hr	tph	lb/hr	lb/ton
007	West Vacuum Filter Vent	3,000	1.5	1.06	0.707
008	East Vacuum Filter Vent	3,000	1.5	1.06	0.707

The following emissions estimate is intended to represent emissions of particulate matter from the transfer of clay or clay based materials throughout the system at Elementis. The transfers are pneumatic and are controlled by dust collectors. A specific emissions factor does not exist for the clay/clay based materials. The pneumatic transfer of cement supplements from AP-42 Section 11.12, Table 11-12-2 has been selected as a representative emissions factor. PM, PM10, and PM2.5 are assumed to be equal. Yearly throughputs are based on yearly production or 8,760 hours per year unless noted.

						Emissions (PM, PM10 and PM2.5)				
		Operating Rate			Emission Factor	Uncontrolled		Control Efficiency	Controlled	
Source	Description	pph	tph	tpy	lb/ton	pph	tpy	%	pph	tpy
9A	Silos	50,000	25.00	20,109	3.14	78.50	31.57	99.9	0.0785	0.0316
9B	Day Bin	50,000	25.00	20,109	3.14	78.50	31.57	99.9	0.0785	0.0316
13	Haver A Packer	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
009	Haver C Packer	4,410	2.21	19,316	3.14	6.92	30.33	99.9	0.0069	0.0303
16	ACM #1 Mill	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
40	Bulk Sack Packer	3,000	1.50	13,140	3.14	4.71	20.63	99.9	0.0047	0.0206
5	ACM #2 Mill	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
41	AC1 Feed Bin	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
42	AC2 Feed Bin	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
43	51 Recycle Bin	4,410	2.21	4,829	3.14	6.92	7.58	99.9	0.0069	0.0076
44	Haver A Hopper	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253
45	Dump Station A	3,675	1.84	4,024	3.14	5.77	6.32	99.9	0.0058	0.0063
46	Dump Station C	4,000	2.00	4,380	3.14	6.28	6.88	99.9	0.0063	0.0069
47	Haver C Packing Hopper	4,410	2.21	19,316	3.14	6.92	30.33	99.9	0.0069	0.0303
10	Pug Mill/51 Mill (1)	8,820	4.41	38,632	3.14	13.85	60.65	99.9	0.0138	0.0606
9C	Pug Mill Feed Hopper	4,410	2.21	19,316	3.14	6.92	30.33	99.9	0.0069	0.0303
20	Anion Addition	4,000	2.00	10,512	3.14	6.28	16.5	99.9	0.0063	0.0165
49	Long Conveyor -Torrit	3,675	1.84	16,097	3.14	5.77	25.27	99.9	0.0058	0.0253

Based on 60% operations.
Based on Running 1/4th of Year (2,190 hrs/yr)

1. The Pug Mill and 51 Mill vent through emission point 10. Each source has a throughput of 4,410 pph.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Oxidizer Combustion Emissions

Fuel Use =	3,000	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	3,000,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.0030	10^6 scf per hour	
	26.28	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.02	0.09	Table 1.4-2
PM10[1]	7.6	0.00745098	0.02	0.09	See Note 1
PM2.5[1]	7.6	0.00745098	0.02	0.09	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.29	1.27	Table 1.4-1
CO	84	0.082352941	0.25	1.10	Table 1.4-1
VOC	5.5	0.005392157	0.02	0.09	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.08	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	1,432.38	0.03	0.003
100 yr GWP*	1	25	298
CO2e	1,432.38	0.68	0.81
Total CO2e		**Metric Tons =**	**1,434**
		Short Tons =	**1,581**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
26,280,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Kewanee Boiler

Fuel Use =	20,085	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	20,085,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.0201	10^6 scf per hour	
	176.08	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.15	0.66	Table 1.4-2
PM10[1]	7.6	0.00745098	0.15	0.66	See Note 1
PM2.5[1]	7.6	0.00745098	0.15	0.66	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	1.97	8.63	Table 1.4-1
CO	84	0.082352941	1.65	7.23	Table 1.4-1
VOC	5.5	0.005392157	0.11	0.48	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.04	0.18	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.05	0.22	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	9,589.53	0.18	0.02
100 yr GWP*	1	25	298
CO2e	9,589.53	4.52	5.39
Total CO2e		**Metric Tons =**	**9,599**
		Short Tons =	**10,581**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
175,940,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

Gas Fired Heater Vent

Fuel Use =	400	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	400,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.00040	10^6 scf per hour	
	3.51	10^6 scf/year	

Criteria and HAP Emissions

Emission Type	EF[5]		Emissions		EF Reference
	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	
PM	7.6	0.00745098	0.01	0.04	Table 1.4-2
PM10[1]	7.6	0.00745098	0.01	0.04	See Note 1
PM2.5[1]	7.6	0.00745098	0.01	0.04	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.04	0.18	Table 1.4-1
CO	84	0.082352941	0.04	0.18	Table 1.4-1
VOC	5.5	0.005392157	0.01	0.04	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.09	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)

Fuel Type	CO2	CH4	N2O
Natural Gas	190.77	0.004	0.0004
100 yr GWP*	1	25	298
CO2e	190.77	0.09	0.11
Total CO2e		**Metric Tons =**	**191**
		Short Tons =	**210**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
3,500,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Emission Unit ID	017	West 1st Stage FBD
	018	West 2nd Stage FBD
	019	East 1st Stage FBD
	020	East 2nd Stage FBD

The following emissions estimate is intended to represent non-combustion emissions of particulate matter and VOC from the operations of the four (4) Fluid Bed Dryers. The dryers are identical in makeup and are estimated to have the same emissions from drying the products. The emissions are based on an estimated emissions value that was developed in the previous permit revisions. PM, PM10, and PM2.5 are assumed to be equal.

Processing Rate	2,205 lb/hr
Operating Hours	8,760 hours

VOC	Production Rate/Uncontrolled Emissions		Controlled Emissions	
	pph	tpy	pph	tpy
	1,500	6,570	0.53	2.32
	2,205	9,658	0.78	3.42

PM/PM10/PM2.5	Production Rate/Uncontrolled Emissions		Controlled Emissions	
	pph	tpy	pph	tpy
	1,500	6,570	0.06	0.26
	2,205	9,658	0.09	0.39

Rounding to 2

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

West 1st Stage

Fuel Use =	5,250	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	5,250,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.005	10^6 scf per hour	
	46.43	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.04	0.18	Table 1.4-2
PM10[1]	7.6	0.00745098	0.04	0.18	See Note 1
PM2.5[1]	7.6	0.00745098	0.04	0.18	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.51	2.23	Table 1.4-1
CO	84	0.082352941	0.43	1.88	Table 1.4-1
VOC	5.5	0.005392157	0.03	0.13	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.08	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	2,506.66	0.05	0.005
100 yr GWP*	1	25	298
CO2e	2,506.66	1.18	1.41
Total CO2e		**Metric Tons =**	**2,509**
		Short Tons =	**2,766**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
45,990,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

West 2nd Stage

Fuel Use =	5,250	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	5,250,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.005	10^6 scf per hour	
	46.43	10^6 scf/year	

Criteria and HAP Emissions					
Emission Type	EF[5]		Emissions		EF Reference
	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	
PM	7.6	0.00745098	0.04	0.18	Table 1.4-2
PM10[1]	7.6	0.00745098	0.04	0.18	See Note 1
PM2.5[1]	7.6	0.00745098	0.04	0.18	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.51	2.23	Table 1.4-1
CO	84	0.082352941	0.43	1.88	Table 1.4-1
VOC	5.5	0.005392157	0.03	0.13	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.08	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	2,506.66	0.05	0.005
100 yr GWP*	1	25	298
CO2e	2,506.66	1.18	1.41
Total CO2e		Metric Tons =	2,509
		Short Tons =	2,766

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
45,990,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

East 1st Stage

Fuel Use =	5,250	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	5,250,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.005	10^6 scf per hour	
	46.43	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.04	0.18	Table 1.4-2
PM10[1]	7.6	0.00745098	0.04	0.18	See Note 1
PM2.5[1]	7.6	0.00745098	0.04	0.18	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.51	2.23	Table 1.4-1
CO	84	0.082352941	0.43	1.88	Table 1.4-1
VOC	5.5	0.005392157	0.03	0.13	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.08	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	2,506.66	0.05	0.005
100 yr GWP*	1	25	298
CO2e	2,506.66	1.18	1.41
Total CO2e		**Metric Tons =**	**2,509**
		Short Tons =	**2,766**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
45,990,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

East 2nd Stage

Fuel Use =	5,250	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	5,250,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.005	10^6 scf per hour	
	46.43	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.04	0.18	Table 1.4-2
PM10[1]	7.6	0.00745098	0.04	0.18	See Note 1
PM2.5[1]	7.6	0.00745098	0.04	0.18	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.51	2.23	Table 1.4-1
CO	84	0.082352941	0.43	1.88	Table 1.4-1
VOC	5.5	0.005392157	0.03	0.13	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.01	0.04	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.02	0.08	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	2,506.66	0.05	0.005
100 yr GWP*	1	25	298
CO2e	2,506.66	1.18	1.41
Total CO2e		**Metric Tons =**	**2,509**
		Short Tons =	**2,766**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
$CH4$ or $N2O = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
45,990,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Flash Dryer

Fuel Use =	10,000	scf/hr	Calculated
Heat Content of Fuel =	1,000	Btu/scf	Standard
Maximum Burner Rating =	10,000,000	Btu/hr	Provided
Hours of Operation =	8,760	hrs/year	
Fuel Usage =	0.0100	10^6 scf per hour	
	87.60	10^6 scf/year	

Criteria and HAP Emissions					
Emission	EF[5]		Emissions		EF
Type	lb/10^6 scf	lb/MMBtu[4]	lb/hr	tons/year	Reference
PM	7.6	0.00745098	0.07	0.31	Table 1.4-2
PM10[1]	7.6	0.00745098	0.07	0.31	See Note 1
PM2.5[1]	7.6	0.00745098	0.07	0.31	See Note 1
SO_2	0.6	0.000588235	0.01	0.04	Table 1.4-2
NOx	100	0.098039216	0.98	4.29	Table 1.4-1
CO	84	0.082352941	0.82	3.59	Table 1.4-1
VOC	5.5	0.005392157	0.05	0.22	Table 1.4-2
Hazardous Air Pollutants					
HAPS- VOC[2]	1.88	0.001843137	0.02	0.09	Table 1.4-3
HAPS - METAL[3]	0.00556	5.45098E-06	0.01	0.04	Table 1.4-4
Total HAPS	NA	NA	0.03	0.13	NA
			Rounding to =	2	

Notes:
1 - It is assumed that PM10 and PM2.5 are equal to TSP (PM).
2 - Total VOC HAPS as listed in Table 1.4-3 (AP-42).
3 - Total METAL HAPS as listed in Table 1.4-4 (AP-42).
4 - To convert from lb/106 scf to lb/MMBtu divide by 1020 per AP-42, Table 1.4.-1, Footnote a.
5 - Emission factors from AP-42, Section 1.4 dated 7/98.

GHG Potential Emissions (Metric Tons)			
Fuel Type	CO2	CH4	N2O
Natural Gas	4,774.60	0.09	0.01
100 yr GWP*	1	25	298
CO2e	4,774.60	2.25	2.68
Total CO2e		**Metric Tons =**	**4,780**
		Short Tons =	**5,268**

*Global Warming Potentials (GWP) Referenced from 40CFR§98 Subpart A Table A-1

$CO2 = 1 \times 10^{-3}$*mass of fuel*HHV*EF (Eq. C-2a)
CH4 or N2O = 1×10^{-3}*mass of fuel*HHV*EF (Eq. C-9a)

Natural Gas Combustion

1.00E-03	conversion factor from kilograms to metric tons	
87,600,000	cubic feet of natural gas burned annually	
1.028E-03	HHV MMBtu/scf	natural gas high heating value (HHV) from Table C-1
53.02	kg CO2/MMBtu	natural gas emission factor from Table C-1
1.00E-03	kg CH4/MMBtu	natural gas emission factor from Table C-2
1.00E-04	kg N2O/MMBtu	natural gas emission factor from Table C-2

Equations, HHV, and emission factors from 40CFR§98 Subpart C unless otherwise noted.

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Flash Dryer VOC Emissions

Product	SD-1
Production Rate (metric tons per day)	40
Hours of operation	8,760
Total lb/hr rate	3,675
Quat Rate (lb/hr)	1,540.00
Quat Activity	86%

Quat Received (lb/hr) = Quat Rate/ Quat Activity

Quat Used (lb/hr)	1,790.7

Ethanol to Reactor = Quat Received x (100%-Quat Activity)

Ethanol to RX (lb/hr)	250.7
Ethanol to the Sewer Vacuum #1	97%

Ethanol to Sewer Vacuum #1 = Ethanol Received x % to Sewer

Ethanol lb/hr to Sewer Vacuum #1 (lb/hr)	243.18

Ethanol to press = Ethanol received - Ethanol to Sewer Vacuum #1

Ethanol to Press (lb/hr)	7.52
% of Ethanol to Filtrate Press	60%

Ethanol to Filtrate Press = % Ethanol to Filtrate Press x Ethanol to Press

Ethanol to Filtrate Press (lb/hr)	4.51

Ethanol to the Sewer Recovery Filter	71.4%

Ethanol to the Sewer Recovery Filter (lb/hr) = % Ethanol to Sewer Recovery Filter x Ethanol to Filtrate Press

Ethanol to Sewer Recovery Filter (lb/hr)	3.22
Ethanol to Atmosphere Recovery Filter	14.30%

Ethanol to Atmosphere Recovery Filter (lb/hr) = Ethanol to Atmosphere Recovery Filter % x Ethanol to Filtrate Press

Ethanol to Atmosphere Recovery Filter (lb/hr)	0.64
Ethanol lb/hr to Atmosphere from Dryers (lb/hr) = Ethanol to Press - Ethanol to Filtrate Press (lb/hr)	
Ethanol lb/hr to Atmosphere from Dryers (lb/hr)	3.01
TPY	13.18

Rounding to 2

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Flash Dryer PM Emissions

The following emissions estimate is intended to represent non-combustion emissions of particulate matter from the operations of the flash dryer. The emissions are based on an estimated emissions developed for the previous permit revisions. PM, PM10, and PM2.5 are assumed to be equal.

Emission Unit ID 3

This unit only operates 100% of the time
Processing Rate 3,675 lb/hr
Operating Hours 8,760 hours

PM/PM10/PM2.5	Production Rate/Uncontrolled Emissions		Controlled Emissions	
	pph	tpy	pph	tpy
	4,583	20,074	0.46	2.01
	3,675	16,097	0.37	1.62

Rounding to 2

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Catalytic Oxidizer VOC and HAP Calculations (A-Side Vacuum Pump is the source of emissions) and the emissions are sent to the oxidizer from control. The emissions are based on the operations when making product SD-1 which yields the highest emissions from this source.

Product			SD-1	
Metric Tons per day			40	
Total lb/hr rate			3,675	
Quat Rate (lb/hr)			1,883.40	
Quat Activity			86%	
Quat Received = Quat Rate/Quat Activity				
Quat Used (lb/hr)			2,190.00	
Ethanol in Quat (%)			14%	
Ethanol to Reactor (lb/hr) = Ethanol in Quat * Quat Received				
Ethanol to RX (lb/hr)			306.60	
Ethanol in the Product to Flash Dryer = 3% x Ethanol to RX				
Ethanol Output (lb/hr)	3%		9.20	
Quat in the Filtrate = Quat Received x 14%				
Quat in Filtrate	14%		306.60	
Ethanol in Filtrate = Ethanol to RX - Ethanol to Flash Dryer				
Ethanol in Filtrate			297.40	
Ethanol Removed by Vacuum Pump = 76% x Ethanol in Filtrate				
Ethanol Removed by Vacuum Pump (lb/hr)	76%		226.03	
Ethanol (%) to the Oxidizer = 100%-Vacuum Pump Removal %				
	24%			
Ethanol to Oxidizer = % Ethanol to Oxidizer * Ethanol in Filtrate				
Ethanol to Oxidizer from Vacuum Pumps 7-17A	24%		71.38 lb/hr	156.32 TPY
Catalytic Oxidizer Efficiency	95%			
Ethanol from Oxidizer (lb/hr) = Ethanol to Oxidizer * (100% - Control Efficiency)				
Ethanol from Oxidizer (lb/hr)			3.57	
Operating Hours			4,380	
Ethanol from Oxidizer (tpy)			7.82	
Methyl Chloride to Filter (300 ppm in Quat) = Quat Received x 300/1,000,000				
Methyl Chloride to Filter (lb/hr)			0.66	
Methyl Chloride to Oxidizer (lb/hr)	100%		0.66	
Methyl Chloride to Oxidizer (TPY)			1.45	
Methyl Chloride from the Oxidizer (lb/hr)			0.03	
Methyl Chloride from the Oxidizer (lb/yr)			131.40	
Methyl Chloride from the Oxidizer (tpy)			0.07	
Hydrochloric Acid formed in Catalytic Oxidizer				
lbs per mole Methyl Chloride (CH_3Cl)			50.488	
lbs per mole Cl			35.453	
mole fraction of Cl in Methyl Chloride (CH_3Cl) = lbs per mole Cl / lbs per mole Methyl Chloride				
mole fraction of Cl in Methyl Chloride (CH_3Cl)			0.702206	
lbs per mole HCl			36.46094	
mole fraction of Cl in HCl = lbs per mole Cl / lbs per mole HCl				
Mole fraction of Cl in HCl			0.972355622	
HCl created (lb/hr) = (Methyl Chloride in - Methyl Chloride out) * mole fraction Cl in CH_3Cl/ lbs per mole CH_3Cl * lbs per mole HCl/ mole fraction Cl in HCl				
HCl created (lb/hr) =			0.33	
HCl (tpy)			0.72	
HCl (lb/yr)			1,445.40	
Rounding to		2		

Catalytic Oxidizer VOC and HAP Calculations (C-Side Vacuum Pump is the source of emissions). These emissions are calculated for worst case hourly emissions. These emissions are based on production of B3000 which is worse case for this source.

Product			B3000	
Tons per day			52.92	
Total lb/hr rate			4,410.00	
Quat Rate (lb/hr)			1,831.80	
Quat Acitivity			86%	
Quat Received = Quat Rate/Quat Activity				
Quat Used (lb/hr)			2,130.00	
Ethanol in Quat (%)		14%		
Ethanol to Reactor (lb/hr) = Ethanol in Quat * Quat Received				
Ethanol to RX (lb/hr)			298.20	
Ethanol in the Product to Flash Dryer = 3% x Ethanol to RX				
Ethanol Output (lb/hr)		3%	8.95	
Quat in the Filtrate = Quat Received x 14%				
Quat in Filtrate		14%	298.20	
Ethanol in Filtrate = Ethanol to RX - Ethanol to Flash Dryer				
Ethanol in Filtrate			289.25	
Ethanol Removed by Vacuum Pump = 76% x Ethanol in Filtrate				
Ethanol Removed by Vacuum Pump (lb/hr)		76%	219.83	
Ethanol (%) to the Oxidizer = 100%-Vacuum Pump Removal %				
		24%		
Ethanol to Oxidizer = % Ethanol to Oxidizer * Ethanol in Filtrate				
Ethanol to Oxidizer from C-Side Vacuum Pumps		24%	69.42 lb/hr	152.03 TPY
Catalystic Oxidizer Efficiency		95%		
Ethanol from Oxidizer (lb/hr) = Ethanol to Oxidizer * (100% - Control Efficiency)				
Ethanol from Oxidizer (lb/hr)			3.47	
Operating Hours			4,380	
Ethanol from Oxidizer (tpy)			7.60	
Methyl Chloride to Filter (300 ppm in Quat) = Quat Received x 300/1,000,000				
Methyl Chloride to Filter (lb/hr)			0.64	
Methyl Chloride to Oxidizer (lb/hr)		100%	0.64	
Methyl Chloride to Oxidizer (TPY)			1.40	
Methyl Chloride from the Oxidizer (lb/hr)			0.03	
Methyl Chloride from the Oxidizer (lb/yr)			131.40	
Methyl Chloride from the Oxidizer (tpy)			0.07	
Hydrochloric Acid formed in Catalytic Oxidizer				
lbs per mole Methyl Chloride (CH_3Cl)			50.488	
lbs per mole Cl			35.453	
mole fraction of Cl in Methyl Chloride (CH_3Cl) = lbs per mole Cl / lbs per mole Methyl Chloride				
mole fraction of Cl in Methyl Chloride (CH_3Cl)			0.702206	
lbs per mole HCl			36.46094	
mole fraction of Cl in HCl = lbs per mole Cl / lbs per mole HCl				
Mole fraction of Cl in HCl			0.972355622	

Total Vacuum Pumps Uncontrolled		
	lb/hr	TPY
VOC	140.80	308.35
M-C	1.30	2.85

HCl created (lb/hr) = (Methyl Chloride in - Methyl Chloride out) * mole fraction Cl in CH_3Cl/ lbs per mole CH_3Cl * lbs per mole HCl/ mole fraction Cl in HCl

HCl created (lb/hr) =		0.32
HCl (tpy)		0.70
HCl (lb/yr)		1,401.60
Rounding to	2	

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

The following emissions are estimated for the Quat Tanks (28, 29, 30, 32, 33, 34) using Tanks 4.09. The breathing losses are vented to atmosphere uncontrolled. Working losses during filling of the tanks are vented to the oxidizer and the controlled working losses are shown on the following page.

Emission Unit ID	Quat Tanks	Working Loss (lb/yr)	Breathing Loss (lb/yr)	Breathing Loss (lb/hr)	Breathing Loss (tpy)
28	D	565.32	105.56	0.01	0.05
29	C	599.06	116.92	0.01	0.06
30	B	599.06	116.92	0.01	0.06
32	S3	565.23	105.56	0.01	0.05
33	S1	801.87	175.28	0.02	0.09
34	S2	816.18	186.46	0.02	0.09

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Tanks vent working losses to the Catalytic Oxidizer. Working losses from the Quat Tanks to the Catalytic Oxidizer are controlled at 95%. (28,29,30,32,33,34)

Quat received (lb/hr) = 1,791.45
Operating hours = 8,760

Quat Tanks	Estimated Throughput (lbs)	Estimated Throughput (gals)	Tanks 4.09 Working Loss (lb/yr)
S1	15,693,092.60	2,384,874.25	565.23
S2	15,693,092.60	2,384,874.25	815.18
S3	15,693,092.60	2,384,874.25	801.87
B	15,693,092.60	2,384,874.25	565.32
C	15,693,092.60	2,384,874.25	599.06
D	15,693,092.60	2,384,874.25	599.06
Total			3,945.72

Catalystic Oxidizer Efficiency = 95%

Ethanol to the oxidizer from Quat Tanks	3,945.72	lb/yr
Ethanol to the oxidizer from Quat Tanks	1.97	TPY
Fill rate of each tank	300	gpm
Hours to fill each tank	132.49	hours
Ethanol to the oxidizer from Quat Tanks	29.78	lb/hr
Ethanol from the oxidizer from Quat Tanks	197.29	lb/yr
Ethanol from the oxidizer from Quat Tanks	1.49	lb/hr
Ethanol from the oxidizer from Quat Tanks	0.10	TPY

Rounding to 2

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

CO_2 Process Emissions

CO_2 is used to cool product in the site.

2007	2008	2009	2010	2011	2012	2013
0.07	0.08	0.09	0.06	0.06	0.07	0.06

Based on the 2006 through 2013 a maximum of 0.09 lb CO_2 was used for every lb of Bentone produced.
To account for potential emissions assume the maximum emission factor is double.
0.18 lb/lb

SD-1 production rate = 40 tons/day
SD-1 production rate = 3333.33333 lb/hr
Operating Hours 8760
CO_2 emissions factor 0.18 lb/lb
CO_2 emissions (tons/year) = CO2 emission factor (lb/lb) x SD-1 production rate (lb/hr)*Operating Hours(hr) / 2000 lb/ton
2,628 TPY

Short tons/metric ton	1.1023

CO2 emissions (metric tons/year) = CO2 Short Tons / 1.1023 short tons/metric ton
2,384 Metric Tons per Year

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results
- Yearly based on average temperature and average ethanol/methanol

	MODEL 1 - EQ1			MODEL 1A - EQ2, DAF1				
Description	Lift to EQ1 Tank	VOC from EQ1 Tank	Model Output	EQ1 to EQ2 Tank	VOC from EQ2 Tank	EQ2 to DAF1 Tank	VOC from DAF1 Tank	DAF1 outlet waste stream
WATER9 INPUT								
waste stream								
Ethanol, ppm	1000.3			663.459				
Methanol, ppm	11.1			8.23947				
Ethanol K_{max}, hr^{-1}	188.9693			203.5467				
Ethanol K_1, L/gm-hr	102.9942			70.148				
Active Biomass, g/L	0.138			0.138				
Water Flow Rate, GPM	350			350		350		350
Air Flow Rate, SCFM	300			300		300		
Average Temperature, F	89.8			89.8		89.8		
WATER9 OUTPUT								
Ethanol, g/s		0.412			0.195		0.021	
Methanol, g/s		0.007			0.005		0.001	
Isopropanol, g/s		0			0		0	
tert-Butanol, g/s		0			0		0	
Ethanol, ppm			663.459			312.58		311.63
Methanol, ppm			8.23947			6.0777		6.05347
Ethanol, Mg/yr		12.987			6.144		0.662	
Methanol, Mg/yr		0.217			0.161		0.017	
Isopropanol, Mg/yr		0.000			0.000		0.000	
tert-Butanol, Mg/yr		0.000			0.000		0.000	
Ethanol, lb/hr	175.90	3.269		116.26	1.546	54.77	0.166	54.61
Methanol, lb/hr	1.95	0.055		1.44	0.041	1.07	0.004	1.06
Ethanol, TPY		14.316			6.773		0.729	
Methanol, TPY		0.240			0.177		0.019	
Total VOC, lb/hr	177.85	3.323			1.587		0.171	
Total VOC, TPY	778.96	14.556			6.950		0.748	

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results
- Yearly based on average temperature and average ethanol/methanol

	MODEL 2 - AB1, AB2, DAF2						
Description	DAF1 to AB1 Tank	VOC from AB1 Tank	AB1 to AB2 Tank	VOC from AB2 Tank	AB2 to DAF2 Tank	VOC from DAF2 Tank	DAF2 outlet waste stream
WATER9 INPUT							
waste stream							
Ethanol, ppm	311.63						
Methanol, ppm	6.05347						
Ethanol K_{max}, hr^{-1}	281.812						
Ethanol K_1, L/gm-hr	24.77061						
Active Biomass, g/L	0.595						
Water Flow Rate, GPM	350		350		350		350
Air Flow Rate, SCFM	300		300		300		
Average Temperature, F	89.8		89.8		89.8		
WATER9 OUTPUT							
Ethanol, g/s		0.001		0.000001		0.0000001	
Methanol, g/s		0.002		0.000319		0.000012	
Isopropanol, g/s		0		0		0	
tert-Butanol, g/s		0		0		0	
Ethanol, ppm			0.425		0.001		0.001
Methanol, ppm			0.836		0.136		0.135
Ethanol, Mg/yr		0.023		0.000037		0.0000017	
Methanol, Mg/yr		0.062		0.010		0.000392	
Isopropanol, Mg/yr		0.000		0.000		0.000	
tert-Butanol, Mg/yr		0.000		0.000		0.000	
Ethanol, lb/hr	79.57	0.0059	0.07	0.00001	0.0001	0.0000004	0.0001
Methanol, lb/hr	0.60	0.0156	0.15	0.003	0.02	0.000099	0.02
Ethanol, TPY		0.0257		0.00004		0.000002	
Methanol, TPY		0.0683		0.011		0.000432	
Total VOC, lb/hr		0.0215		0.003		0.000099	
Total VOC, Ton/yr		0.0940		0.011		0.000434	

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results
- Yearly based on average temperature and average ethanol/methanol

	MODEL 3 - Sludge Tank		TOTAL
Description	Sludge Tank	VOC from Sludge Tank	
WATER9 INPUT			
waste stream			
Ethanol, ppm	174.7		
Methanol, ppm	180.4		
Ethanol K_{max}, hr^{-1}	198.8079		
Ethanol K_1, L/gm-hr	14.81906		
Active Biomass, g/L	1.0674		
Water Flow Rate, GPM	77		
Air Flow Rate, SCFM	300		
Average Temperature, F	89.8		
WATER9 OUTPUT			
Ethanol, g/s		0.00017	
Methanol, g/s		0.018	
Isopropanol, g/s		0	
tert-Butanol, g/s		0	
Ethanol, ppm			
Methanol, ppm			
Ethanol, Mg/yr		0.005	19.822
Methanol, Mg/yr		0.572	1.040
Isopropanol, Mg/yr		0.000	0.000
tert-Butanol, Mg/yr		0.000	0.000
Ethanol, lb/hr	6.73	0.001	4.99
Methanol, lb/hr	6.95	0.144	0.26
Ethanol, TPY		0.006	21.85
Methanol, TPY		0.631	1.15
Total VOC, lb/hr		0.145	5.25
Total VOC, Ton/yr		0.637	23.00

Elementis Specialties
Charleston Facility

Potesta & Associates, Inc.
Project No. 0101-12-0404

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results

- Hourly based on maximum temperature and maximum ethanol/methanol feed plus 10%

	MODEL 1 - EQ1			MODEL 1A - EQ2, DAF1				
Description	Lift to EQ1 Tank	VOC from EQ1 Tank		EQ1 to EQ2 Tank	VOC from EQ2 Tank	EQ2 to DAF1 Tank	VOC from DAF1 Tank	DAF1 outlet waste stream
WATER9 INPUT								
waste stream								
Ethanol, ppm	1386			653.417				
Methanol, ppm	58.3			40.923				
Ethanol K_{max}, hr^{-1}	188.9693			203.5467				
Ethanol K_1, L/gm-hr	102.9942			70.148				
Active Biomass, g/L	0.138			0.138				
Water Flow Rate, GPM	350			350		350		350
Air Flow Rate, SCFM	300			300		300		
Average Temperature, F	108.7			108.7		108.7		
WATER9 OUTPUT								
Ethanol, g/s		0.94837			0.10176		0.019432	
Methanol, g/s		0.047253			0.03224		0.00411	
Ethanol, ppm			653.417			165.035		164.154
Methanol, ppm			40.923			27.921		27.735
Ethanol, Mg/yr		18.814			4.752		0.613	
Methanol, Mg/yr		1.490			1.017		0.130	
Ethanol, lb/hr	242.87	7.527		114.50	0.808	28.92	0.154	28.77
Methanol, lb/hr	10.22	0.375		7.17	0.256	4.89	0.033	4.86
Ethanol, TPY		32.968			3.537		0.676	
Methanol, TPY		1.643			1.121		0.143	
Total VOC, lb/hr	253.09	7.902			1.064		0.187	
Total VOC, Ton/yr	1108.54	34.610			4.658		0.818	

Elementis Specialties
Charleston Facility

Potesta & Associates, Inc.
Project No. 0101-12-0404

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results
- Hourly based on maximum temperature and maximum ethanol/methanol feed plus 10%

MODEL 2 - AB1, AB2, DAF2							
Description	DAF1 to AB1 Tank	VOC from AB1 Tank	AB1 to AB2 Tank	VOC from AB2 Tank	AB2 to DAF2 Tank	VOC from DAF2 Tank	DAF2 outlet waste stream
WATER9 INPUT							
waste stream							
Ethanol, ppm	164.154						
Methanol, ppm	27.735						
Ethanol K_{max}, hr^{-1}	281.812						
Ethanol K_1, L/gm-hr	24.77061						
Active Biomass, g/L	0.595						
Water Flow Rate, GPM	350		350		350		350
Air Flow Rate, SCFM	300		300		300		
Average Temperature, F	108.7		108.7		108.7		
WATER9 OUTPUT							
Ethanol, g/s		3.46E-04		3.44E-07		1.85E-08	
Methanol, g/s		0.008331		0.00090		0.00004	
Ethanol, ppm			0.13553		1.35E-04		22.906
Methanol, ppm			2.56777		0.27763		0.27568
Ethanol, Mg/yr		0.010915		0.000001		0.000001	
Methanol, Mg/yr		0.263		0.028		0.001	
Ethanol, lb/hr	79.57	0.0027	0.02	0.000003	0.00002	0.0000001	4.01
Methanol, lb/hr	0.60	0.0661	0.45	0.007	0.05	0.000340	0.05
Ethanol, TPY		0.0120		0.00001		0.000001	
Methanol, TPY		0.2896		0.031		0.001488	
Total VOC, lb/hr		0.069		0.007		0.000340	
Total VOC, Ton/yr		0.3016		0.031		0.001489	

Elementis Specialties
Charleston Facility

Potesta & Associates, Inc.
Project No. 0101-12-0404

By: JAG
Date: 12/5/2013

Checked By: CCS
Date: 9/23/2014

Preliminary Water9 Results
- Hourly based on maximum temperature and maximum ethanol/methanol feed plus 10%

MODEL 3 - SLUDGE TANK		TOTAL
Description	VOC from Sludge Tank	
WATER9 INPUT		
waste stream		
Ethanol, ppm		
Methanol, ppm		
Ethanol K_{max}, hr^{-1}		
Ethanol K_1, L/gm-hr		
Active Biomass, g/L		
Water Flow Rate, GPM		
Air Flow Rate, SCFM		
Average Temperature, F		
WATER9 OUTPUT		
Ethanol, g/s	1.26E-03	
Methanol, g/s	0.30739	
Ethanol, ppm		
Methanol, ppm		
Ethanol, Mg/yr	0.040	24.229
Methanol, Mg/yr	9.694	12.623
Ethanol, lb/hr	0.010	8.50
Methanol, lb/hr	2.440	3.18
Total VOC, lb/hr	2.450	11.68

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Fugitive Emission Calculations

Fugitive Emission Source	Emission Factor (kg/hr/ source)[1]	Emission Factor (lb/hr)	Number	Total (lb/hr)	Total (lb/yr)
Pump Seals - Light Liquids	0.0199	0.04387154	0	0	-
Pump Seals - Heavy Liquids	0.00862	0.019003652	3	0.057	499.4
Valves (in-line) - Gas	0.00597	0.013161462	0	0.000	-
Valves (in-line) - Light Liquid	0.00403	0.008884538	0	0	-
Valves (in-line) - Heavy Liquid	0.00023	0.000507058	50	0.025	222.1
Gas-Safety Relief Valves	0.104	0.2292784	0	0	-
Open-Ended Lines	0.0017	0.00374782	0	0	-
Flanges	0.00183	0.004034418	877	3.538	30,994.5
Sampling Connections	0.015	0.033069	6	0.198	1,738
Compressor Seals	0.228	0.5026488	0	0.000	-

Total hourly VOC from fugitive emissions:		3.82 lb/hr
kg/hr to lb/hr conversion factor	2.2046	
Annual operating hours	8,760	
Annual VOC from fugitive emissions: (lb/hr x 8,760 hr/yr / 2,000 lb/ton)		16.73 TPY

1. US EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-077 November 1995
Table 2-1 SOCMI Average Emission Factors

Rounding to 2

By: PEW
Date: 9/23/2014

Checked By: CCS
Date: 9/23/2014

Vehicle Activity

	Trucks
Load Weight (tons)	33.75
Vehicle Weight (tons)	6.25
Vehicles Per Hour	7
Vehicles Per Year	2,555
Mean Vehicle Weight (tons)	23.13
Round Trip Distance	0.8

Paved Haulroads

Emission Factor Equation from AP-42 Section 13.2.1, Paved Roads (January 2011):
E = [k * (sL/2)^0.65 * (W/3)^1.5 - C] * (1 - (P/4*N) = lb / Vehicle Mile Traveled (VMT)

	PM	PM_{10}	$PM_{2.5}$	
k =	0.082	0.016	0.00054	dimensionless, particle size multiplier
sL =	9.7	9.7	9.7	surface material silt content (g/m^2)
Wtruck=	23.13	23.13	23.13	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
C=	0.00047	0.00047	0.00047	factor for exhaust, brake wear and tire wear
$e_{truck=}$	4.37	0.85	0.03	lb/VMT

Rounding to 2

Trucks

Pollutant	No. of Vehicles		Miles Per Trip	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	7	2,555	0.80	N	0	24.47	4.47	24.47	4.47
PM_{10}	7	2,555	0.80	N	0	4.76	0.87	4.76	0.87
$PM_{2.5}$	7	2,555	0.80	N	0	0.17	0.04	0.17	0.04

Pollutant	Uncontrolled Emissions		Controlled Emissions	
	(lb/hr)	(TPY)	(lb/hr)	(TPY)
PM	24.47	4.47	24.47	4.47
PM_{10}	4.76	0.87	4.76	0.87
$PM_{2.5}$	0.17	0.04	0.17	0.04

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

Wastewater Treatment

Elementis Specialties, Inc. will monitor the following parameters and maintain the following records:

- Flow to WWTP
- Flow from WWTP
- Incoming VOC (ES COD and BOD) concentration
- Outgoing VOC (ES COD and BOD) concentration
- Air flow to the equalization and aeration basins

Processes

Elementis Specialties, Inc. will follow the monitoring, recordkeeping, reporting, and testing requirements as currently required in the permit:

- Annual operating hours
- Annual production
- Annual CO2 usage
- Annual raw material usage
- Total natural gas use for the site on a monthly and annual basis based on natural gas billing from the supplier

Elementis Specialties, Inc. is requesting that the requirement for opacity readings be removed from Emission Point 40 since the dust collector is equipped with broken bag detectors.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Elementis Specialties, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a modification to Regulation 13 Permit R13-1874E for its chemical manufacturing facility located at 1003 MacCorkle Avenue, SW, Charleston, in Kanawha County, West Virginia. The latitude and longitude coordinates are: 38.3600N and -81.26615W.

The applicant estimates that, as a result of the proposed modification, emissions of Regulated Air Pollutants will change by the following amounts: Carbon Monoxide 12.79 tons per year (TPY), Particulate Matter -26.20 TPY, Particulate Matter 10 -19.88 TPY, Particulate Matter 2.5 -18.42 TPY, Nitrogen Oxides -5.82 TPY, Sulfur Dioxide 0.16 TPY and Volatile Organic Compounds -5.68 TPY, Methyl Chloride -0.16 TPY, Hydrochloric Acid -3.18 TPY, and Methanol 1.15 TPY.

The facility is operating and will begin operating under the revised permit when issued on or about November 15, 2014. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the (INSERT DATE) day of October, 2014.

By: Elementis Specialties, Inc.
John Snodgrass
Plant Manager
1003 MacCorkle Avenue, SW
Charleston WV 25303-1323

APPENDIX

PRELIMINARY
EMISSION CALCULATIONS REPORT

Prepared for:

Elementis Specialties, Inc.
1003 MacCorkle Avenue, SW
Charleston, West Virginia 25303

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-12-0404

February 28, 2014

POTESTA

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EMISSION CALCULATIONS REPORT

1.0 INTRODUCTION

Elementis Specialties, Inc. (Elementis) was requested by the West Virginia Department of Environmental Protection, Division of Air Quality (DAQ), to determine potential to emit (PTE) and actual emissions from the Charleston facility due to addition of wastewater treatment plant (WWTP) equipment.

2.0 PURPOSE

The Elementis facility in Charleston is permitted under R13-1874E. The permit includes both the Dry and Wet Bentone processes. The facility is not permitted as a major source of Criteria or Hazardous Air Pollutants. Volatile organic compounds (VOC) emissions are permitted at 96.63 tons per year (TPY). The PTE for the VOC emissions was calculated conservatively to account for the range of products that are manufactured at the facility.

Prior to April 2009, the facility discharged wastewater to the Charleston Sanitary Board's (Board) Publicly Owned Treatment Works (POTW) under the terms of an Industrial User Permit. At the request of the Charleston Sanitary Board, pre-treatment equipment was installed in 2003 to pretreat the wastewater before discharge. Two tanks were installed to treat the wastewater as Sequencing Batch Reactors (SBR). Even with pretreatment, the facility was unable to meet the chloride and other limits in its permit and the Board was imposing more stringent limits in the 2007 permit renewal. Elementis and the Board entered into a consent order that required Elementis to develop a plan to comply with the new limits, and Elementis proposed to discontinue its wastewater discharge to the POTW in 2009 and construct additional treatment to allow direct discharge to the Kanawha River. The full treatment facility has been in operation since April 2009 and discharges directly to the Kanawha River under National Pollutant Discharge Elimination System (NPDES) Permit No. WV0051560. The two tanks that acted as SBRs now serve as Equalization Tanks. Two dissolved air flotation (DAF) units, two aeration basins (AB) and a sludge tank were added to the facility under the final design.

For business reasons, the production of Dry Bentone decreased at the Charleston facility. In July 2010, the last Dry Bentone was produced at the Charleston facility. The facility can no longer produce Dry Bentone because the process equipment was removed from the facility and sent to other Elementis sites (See **Appendix A**).

3.0 METHODS

3.1 Wastewater PTE

To determine the overall PTE of the Elementis facility for the time in question, two configurations of the WWTP (pretreatment and direct discharge) must be included in the calculations.

3.1.1 Direct Discharge Unit (April 2009 to Current)

1. Four (4) WATER9 models were developed by Potesta & Associates, Inc. (POTESTA).
   a. Model 1 included Equalization Tank 1 (EQ1)
   b. Model 1A included Equalization Tank 2 (EQ2) and Dissolved Air Flotation 1 (DAF1).
   c. Model 2 included Aeration Basin 1 (AB1), Aeration Basin 2 (AB2) and Dissolved Air Flotation 2 (DAF2).
   d. Model 3 included the Sludge Tank (ST).

2. Wastewater stream sampling results at various locations in the treatment system were provided by Elementis. Ethanol and methanol were above detection limits and ethanol is the primary component of the waste stream.
   a. Samples were taken on ten days between August 20 and August 31, 2012.
   b. Samples were collected in eight locations (EQ1 inlet, EQ1 outlet, EQ2 outlet, AB1 inlet, AB1 outlet, AB2 outlet, ST inlet, and ST outlet).
   c. The average ethanol and methanol concentrations were determined for each sample location.

3. Elementis sampled Equalization Tank 1, Equalization Tank 2, Aeration Basin 1 and the Sludge Tank to determine biological uptake of ethanol.

4. EnviTreat conducted respirometer testing of the samples from the four units (See **Appendix B**).

5. The biological kinetic constants K_{max} (zero-order substrate removal constant) and K_1 (first-order substrate removal constant) were calculated using the EnviTreat results. The methodology for this calculation was taken from "Determination of Biological Kinetic Constants Using Respirometry for the WATER9 Air Emissions Model" by Richard A. DiMenna, PE and Lawrence R. Sandeen published in 2004 by the Water Environment Federation (See **Appendix C**).
   a. EnviTreat Excel Workbook ELEMENTIS #2 112-18-13 AEROBIC which had raw data was used.
   b. A new worksheet was created for each test run.
   c. Time (in hours) and S (Substrate) in mg/L were copied into the new worksheet.
   d. Rate (mg/L-hr) was calculated (change in S/change in time).
   e. Log-mean S, mg/L was calculated (change in S/ change in Ln S).

f. Ratio Rate/ Log-mean S was calculated (Rate/Log-mean S).
g. Reciprocal Rate was calculated (1/Ratio Rate/Log-mean S).
h. A graph of Log-mean S (x) versus Reciprocal Rate (y) was created.
i. A graph of the Log-mean S versus Log-Mean S near the y-intercept was created.
j. The trend line was added to determine the slope of the line.
k. Kmax was calculated:

$$\text{Kmax} = \frac{1}{\text{Slope near intercept} \times \text{MLVSS} \times \text{HSF}}$$

l. K1 was calculated

$$\text{K1} = \frac{\text{ratio of removal rate to Log-Mean S}}{\text{MLVSS} \times \text{HSF}}$$

HSF = headspace factor based on Henry's Law Constant and headspace and liquid volumes ~ 1

m. In WATER9 under the Waste menu, the Edit Compound Properties was selected. Ethanol was selected and the calculated Kmax and K1 values were entered.

6. United States Environmental Protection Agency (USEPA) WATER9 Version 2 utilized for calculations.

7. The four WATER9 models were run for a maximum temperature/ethanol/methanol concentration (based on highest sample value increased by 10%) case and an average temperature/ethanol/methanol case. The inflow to EQ1's model was based on the wastewater testing. The effluent from each model was input into the next downstream model; therefore, EQ1's effluent was inserted in the EQ2's model as the influent stream.

8. WATER9 provided results in grams/second (g/s). These results were converted into pound per hour (lb/hr) values.

9. Based on year round operation (8,760 hours), emissions were calculated in (TPY).

3.1.2 Sequencing Bath Reactors (2003 to April 2009)

WATER9 does not contain a specific model for SBR emissions. However, as a result of an internet search, POTESTA identified a method to estimate air emissions from a SBR using WATER9 in the article "Estimating Wastewater Treatment Emissions Using EPA's WATER9 Modeling Software by S. Eheikh and et. CH2M Hill (See **Appendix D**). In WATER9, an activated sludge aeration basin and clarifier are used. The aeration basin models the emissions during the filling and aeration portion of the batch reactors system. The clarifier models the emissions during the settling and decant phases of the batch reactor system.

Elementis typically used a four hour cycle time - one hour for filling, one hour for aeration, one hour for settling, and one hour for decanting. Aeration is not used during the settling and decanting process. Elementis typically had six batches per day. This resulted in 12 hours of aeration and 12 hours of no aeration during a 24- hour period.

The WATER9 model was set up with an activated sludge aeration basin and clarifier. The Kmax and K1 determined from AB1 were used in the model along with the same wastewater flow rate, air flow rate, and average ethanol and methanol concentrations.

The activated sludge results were multiplied by 12 hours/24 hours in the day and the primary clarifier results were multiplied by 12 hours/24 hours in the day to account for the time in each stage. Since there are two SBR units, the results were then multiplied by two.

3.2 Actual Emissions

E-Metrics data was provided to POTESTA by Elementis. E-Metrics is an internal report of environmental metrics that includes VOC, SOx, and NOx emissions from process and combustion sources. Combustion emissions were calculated for CO and PM based on estimated natural gas use from the NOx emissions.

The PM calculation does not include any PM from dust collectors or material handling equipment.

3.2.1 2003 – 2008 Actual Emissions

The actual emissions from 2003-2008 were based on the E-Metrics emissions plus the WATER9 results for the SBRs. The SBR emissions were not prorated because the SBR only emissions represented 1% of the total PTE.

3.2.2 2009 – 2010 Actual Emissions

The actual emissions for 2009 and 2010 were based on the E-Metrics emissions plus a pro-rate of the WATER9 results for the WWTP. Production of Dry Bentone was limited in 2009 and ceased altogether in July 2010. Based on the PTE, the process emissions with Dry Bentone accounted for 81% of emissions and the WWTP accounted for 19%. The actual E-Metrics VOC emissions were divided by 81% to determine the total VOC emissions and then multiplied by 19% to determine the WWTP portion.

3.2.3 2011 – 2013 Actual Emissions

The actual emissions for 2011 through 2013 were based on the E-Metrics emissions plus a pro-rate of the WATER9 results for the WWTP. Based on the PTE, the process emissions accounted for 60% of emissions and the WWTP accounted for 40%. The actual E-Metrics VOC emissions were divided by 60% to determine the total VOC emissions and then multiplied by 40% to determine the WWTP portion.

3.3 PTE

Monthly PTE calculations were made for the years which had changes in the process or WWTP operations (2009 and 2010). The monthly PTE values were multiplied by the appropriate number of months for each of the operating scenarios for the year to determine an annual PTE.

4.0 RESULTS

A printed copy of the Excel workbook Elementis Emission estimation 2003 – 2013 is provided as **Appendix E.**

Actual emissions for VOCs ranged from 27 TPY to 44.6 TPY, well below the permitted level of 96.63 TPY.

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 44

1. Name or type and model of proposed affected source:

   Haver A Packing Hopper

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 3,675 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   NA

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 45

1. Name or type and model of proposed affected source:

   "A" Bag Dump Station

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 3,675 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   NA

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 46

1. Name or type and model of proposed affected source: "C" Bag Dump Station
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 4,000 lb/hr Organo Clay Product
4. Name(s) and maximum amount of proposed material(s) produced per hour: NA
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	6.28	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 47

1. Name or type and model of proposed affected source:

   Haver C Packing Hopper

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 4,410 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   NA

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	6.92	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 48

1. Name or type and model of proposed affected source: CO_2 Transfer System
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: CO_2 is used for cooling
4. Name(s) and maximum amount of proposed material(s) produced per hour: NA
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	Days/Week	Weeks/Year

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ °F and psia

a.	NO_X	lb/hr	grains/ACF
b.	SO_2	lb/hr	grains/ACF
c.	CO	lb/hr	grains/ACF
d.	PM_{10}	lb/hr	grains/ACF
e.	Hydrocarbons	lb/hr	grains/ACF
f.	VOCs	lb/hr	grains/ACF
g.	Pb	lb/hr	grains/ACF
h.	CO_2	NA lb/hr	NA grains/ACF
		lb/hr	grains/ACF
		lb/hr	grains/ACF
		lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 20

1. Name or type and model of proposed affected source:

   Anion Addition

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. Up to 4,000 lb/hr of Anion Addition will be used.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   NA

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ °F and psia

a.	NO_X	NA lb/hr	NA	grains/ACF
b.	SO_2	NA lb/hr	NA	grains/ACF
c.	CO	NA lb/hr	NA	grains/ACF
d.	PM_{10}	6.28 lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA lb/hr	NA	grains/ACF
f.	VOCs	NA lb/hr	NA	grains/ACF
g.	Pb	NA lb/hr	NA	grains/ACF
h.	Specify other(s)			
		lb/hr		grains/ACF
		lb/hr		grains/ACF
		lb/hr		grains/ACF
		lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 49

1. Name or type and model of proposed affected source:

   Long Conveyor

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr will be transferred.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr will be transferred.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form.*

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 10 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ °F and psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

- ☐ *Emergency Vent Summary Sheet*
- ☒ *Leak Sources Data Sheet*
- ☐ *Toxicology Data Sheet*
- ☐ *Reactor Data Sheet*
- ☐ *Distillation Column Data Sheet*

1. Chemical process area name and equipment ID number (as shown in *Equipment List Form*)
   Equipment Leaks

2. Standard Industrial Classification Codes (SICs) for process(es)
   2899

3. List raw materials and ☒ attach MSDSs

4. List Products and Maximum Production and ☒ attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)
Rheological Additive	4,410	19,316

5. Complete the *Emergency Vent Summary Sheet* for all emergency relief devices.

6. Complete the *Leak Source Data Sheet* and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.

8A. Complete the *Toxicology Data Sheet* or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references.

8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).

9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)

9A. Types and amounts of wastes to be disposed:

9B. Method of disposal and location of waste disposal facilities:

Carrier: Phone:

9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum	24	7	52
10B. Typical	24	7	50

11. Complete a *Reactor Data Sheet* for each reactor in this chemical process.

12. Complete a *Distillation Column Data Sheet* for each distillation column in this chemical process.NA

13. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Tons of product produced per month. Amount of raw materials used. Hours of operation.
REPORTING	**TESTING**
None	None

MONITORING. Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

RECORDKEEPING. Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING. Please describe the proposed frequency of reporting of the recordkeeping.

TESTING. Please describe any proposed emissions testing for this process equipment or air pollution control device.

14. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
   a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
   b. continuous emissions (in-stack) monitoring plan
   c. ambient monitoring plan
   d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process:
  a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
  b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
  c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following
   a. Emissions of each pollutant in pound(s) per batch, from each process step
   b. Annual emissions based on number of batches requested per year
   c. The total time for each process step and the duration of the emissions during the process step
   d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture disks, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)
Not Applicable				

All routine vents (non-emergency) should be listed on the *Emission Points Data Summary Sheet.*

[1] Indicate the emission point, if any, to which source equipment normally vents. Do not assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]	0			
	heavy liquid VOC[8]	3	Visual Inspection	Within 7 days	499.4
	Non-VOC[9]	0			
Valves[10]	Gas VOC	0			
	Light Liquid VOC	0			
	Heavy Liquid VOC	50	Visual Inspection	Within 7 days	222.1
	Non-VOC	0			
Safety Relief Valves[11]	Gas VOC	0			
	Non VOC	0			
Open-ended Lines[12]	VOC	0			
	Non-VOC	0			
Sampling Connections[13]	VOC	6	Visual Inspection	Within 7 days	1,738
	Non-VOC				
Compressors	VOC	0			
	Non-VOC	0			
Flanges	VOC	877	Visual Inspection	Within 7 days	30,994
	Non-VOC				
Other	VOC				
	Non-VOC				

[1 - 13] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/CAS Number	OSHA Limits[2]		Acute[3] TC_{LO} - Animal LC_{LO} - Animal LC_{50} - Animal	Chronic[4]	Irritation[5]	References
	TWA	CL				

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available.
[4] Relying on animal or human studies, indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenecity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA's TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA's AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name B Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 30	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B/30
5. Date of Commencement of Construction (for existing tanks) 1984	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Quat amine now contains Ethanol instead of isopropanol	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 11,374 gallons	
9A. Tank Internal Diameter (ft) 11	9B. Tank Internal Height (or Length) (ft) 16
10A. Maximum Liquid Height (ft) 16	10B. Average Liquid Height (ft) 8
11A. Maximum Vapor Space Height (ft) 8	11B. Average Vapor Space Height (ft) 8
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 11,374 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 209.6

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☒ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):

☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)

☐ External Floating Roof ___ pontoon roof ___ double deck roof

☐ Domed External (or Covered) Floating Roof

☐ Internal Floating Roof ___ vertical column support ___ self-supporting

☐ Variable Vapor Space ___ lifter roof ___ diaphragm

☐ Pressurized ___ spherical ___ cylindrical

☐ Underground

☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:

☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):

☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting
  - Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer (only during filling)

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	116.92	599.06	lb/yr	715.98	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA's TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA's AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name C Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 29	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B/29
5. Date of Commencement of Construction (for existing tanks) 1984	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Quat amine now contains Ethanol instead of isoproponal	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 11,374 gallons	
9A. Tank Internal Diameter (ft) 11	9B. Tank Internal Height (or Length) (ft) 16
10A. Maximum Liquid Height (ft) 16	10B. Average Liquid Height (ft) 8
11A. Maximum Vapor Space Height (ft) 8	11B. Average Vapor Space Height (ft) 8
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 11,374 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 209.6

15. Maximum tank fill rate (gal/min):

16. Tank fill method: ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):

☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)

☐ External Floating Roof ___ pontoon roof ___ double deck roof

☐ Domed External (or Covered) Floating Roof

☐ Internal Floating Roof ___ vertical column support ___ self-supporting

☐ Variable Vapor Space ___ lifter roof ___ diaphragm

☐ Pressurized ___ spherical ___ cylindrical

☐ Underground

☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:

☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):

☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	116.92	599.06	lb/hr	715.98	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name D Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 28	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B/28
5. Date of Commencement of Construction (for existing tanks) 1974	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Quat amine now contains Ethanol instead of isoproponal	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 9,988 gallons	
9A. Tank Internal Diameter (ft) 10	9B. Tank Internal Height (or Length) (ft) 17
10A. Maximum Liquid Height (ft) 17	10B. Average Liquid Height (ft) 8
11A. Maximum Vapor Space Height (ft) 9	11B. Average Vapor Space Height (ft) 9
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 9,988 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 238.78

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):

☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)

☐ External Floating Roof ___ pontoon roof ___ double deck roof

☐ Domed External (or Covered) Floating Roof

☐ Internal Floating Roof ___ vertical column support ___ self-supporting

☐ Variable Vapor Space ___ lifter roof ___ diaphragm

☐ Pressurized ___ spherical ___ cylindrical

☐ Underground

☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:

☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):

☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting
  - Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	105.56	565.32	lb/hr	670.88	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA's TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA's AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name S1 Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 33	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B/33
5. Date of Commencement of Construction (for existing tanks) 1980	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable)	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 20,305 gallons	
9A. Tank Internal Diameter (ft) 12	9B. Tank Internal Height (or Length) (ft) 24
10A. Maximum Liquid Height (ft) 24	10B. Average Liquid Height (ft) 12
11A. Maximum Vapor Space Height (ft) 12	11B. Average Vapor Space Height (ft) 12
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 20,305 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
117.4

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
- ☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
  ___ other (describe)
- ☐ External Floating Roof ___ pontoon roof ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof ___ vertical column support ___ self-supporting
- ☐ Variable Vapor Space ___ lifter roof ___ diaphragm
- ☐ Pressurized ___ spherical ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	175.28	801.87	lb/hr	977.15	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA's TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA's AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name S2 Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 34	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B
5. Date of Commencement of Construction (for existing tanks) 1980	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Quat amine now contains Ethanol instead of isoproponal	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 20,305 gallons	
9A. Tank Internal Diameter (ft) 12	9B. Tank Internal Height (or Length) (ft) 24
10A. Maximum Liquid Height (ft) 24	10B. Average Liquid Height (ft) 12
11A. Maximum Vapor Space Height (ft) 12	11B. Average Vapor Space Height (ft) 12
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 20,305 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 117.4

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):

☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)

☐ External Floating Roof ___ pontoon roof ___ double deck roof

☐ Domed External (or Covered) Floating Roof

☐ Internal Floating Roof ___ vertical column support ___ self-supporting

☐ Variable Vapor Space ___ lifter roof ___ diaphragm

☐ Pressurized ___ spherical ___ cylindrical

☐ Underground

☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:

☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):

☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	186.46	816.18	lb/hr	1,002.64	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Quat Storage	2. Tank Name S3 Tank
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) 32	4. Emission Point Identification No. (as assigned on *Equipment List Form*) 7-17B
5. Date of Commencement of Construction (for existing tanks) 1980	
6. Type of change ☐ New Construction ☒ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Quat amine now contains Ethanol instead of isoproponal	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode).	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.):	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 9,988 gallons	
9A. Tank Internal Diameter (ft) 10	9B. Tank Internal Height (or Length) (ft) 17
10A. Maximum Liquid Height (ft) 17	10B. Average Liquid Height (ft) 8
11A. Maximum Vapor Space Height (ft) 9	11B. Average Vapor Space Height (ft) 9
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 9,988 gallons	

13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
2,384,874	6,533.9

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume): 238.78

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☐ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):

☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof ___ dome roof
___ other (describe)

☐ External Floating Roof ___ pontoon roof ___ double deck roof

☐ Domed External (or Covered) Floating Roof

☐ Internal Floating Roof ___ vertical column support ___ self-supporting

☐ Variable Vapor Space ___ lifter roof ___ diaphragm

☐ Pressurized ___ spherical ___ cylindrical

☐ Underground

☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction:

☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):

☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based.
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2-day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid:	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☐ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☒ Other[1] (describe): Catalytic Oxidizer

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
Ethanol	105.56	565.23	lb/hr	670.79	EPA

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☒ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE SHEETS

ATTACHMENT M INDEX

CONTROL DEVICE	PAGE
DC-770001 – "A" Bag Dump Station	M1
DC-701300 – Clay Storage Silos – A-F	M5
DC-720100 – Day Bin	M9
HP-780304 – 51 Mill Recycle (Bin Vent)	M13
DF-760018 – West 2nd Stage FBD	M17
DF-760017 – West 1st Stage FBD	M21
DF-760019 – East 1st Stage FBD	M25
DF-760020 – East 2nd Stage FBD	M29
CO-320001 – Various Sources through Catalytic Oxidizer	M33
DC-751500 – Flash Dryer System	M36
DC-750029 – ACM #1 Mill	M40
DC-753400 – ACM #2 Feed Bin (Bin Vent)	M44
DC-752500 – ACM #1 Feed Bin (Bin Vent)	M48
DC-750030 – ACM #2 Mill	M52
PV-780303 – Pug Mill Vacuum Cleaner	M56
DC-780201 – Pug Mill Feed Hopper (Bin Vent)	M60
DC-790001 – Haver C Packer	M64
DC-770025 – Haver A Packer	M68
DC-780100 – "C" Bag Dump Station	M72
DC-790000 – Haver C Packing Hopper (Bin Vent)	M76
DC-752010 – Long Conveyor	M80
DC-770021 – Haver A Packing Hopper (Vent)	M84
TK-750310 – Anion Addition	M88
DC-770135 – Receiver Bulk Bag Hopper (Bin Vent)	M92
DC-780401 – 51 Mill	M96

Source: "A" Bag Dump Station
Emission Point I.D.: 45

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-770001

Equipment Information and Filter Characteristics

1. Manufacturer: Smoot (Tech Air)
   Model No. SBV-9-3-30

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 10 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.88 in.
   Length 3 (36 in) ft.

8. Total cloth area: 110 ft^2

9. Number of bags: 9

10. Operating air to cloth ratio: 2.9:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 1,400 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: Ambient °F

19. Fan Requirements: 3 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	11.4	99.9
2 – 4	22.7	100
4 – 6	20.7	
6 – 8	17.5	
8 – 10	13.9	
10 – 12	8.8	
12 – 16	5.0	
16 – 20	0.0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visual inspection of bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: Clay Storage Silos A-F
Emission Point I.D.: 9A

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-701300

Equipment Information and Filter Characteristics

1. Manufacturer: Flexkleen
   Model No. 84-CT-30
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 10 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   Diameter 5.5 in.
   Length 7 (84 in.) ft.
8. Total cloth area: 250 ft^2
9. Number of bags: 30
10. Operating air to cloth ratio: 4.64:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 1,160 ACFM at 70 °F and 14.7 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: 70 °F
19. Fan Requirements: 2 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Clay

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	78.50	NA	0.0785	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0	99.9
2 – 4	0.647	
4 – 6	2.315	
6 – 8	3.563	
8 – 10	5.811	
10 – 12	3.787	
12 – 16	8.665	
16 – 20	8.755	
20 – 30	11.748	100
30 – 40	7.37	
40 – 50	3.789	
50 – 60	8.015	
60 – 70	4.198	
70 – 80	4.205	
80 – 90	4.14	
90 – 100	0	
>100	23.02	

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Day Bin
Emission Point I.D.: 9B

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-720100

Equipment Information and Filter Characteristics

1. Manufacturer: Flexkleen
   Model No. DC-460
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton — Weight: 10 oz./sq.yd
   - ☐ Teflon — Thickness: in
   - ☐ Others, specify
7. Bag Dimension:
   - Diameter: 3.66 in.
   - Length: 6.75 (81 in.) ft.
8. Total cloth area: 775 ft^2
9. Number of bags: 12x10 = 120
10. Operating air to cloth ratio: 1.49:1 ft/min
11. Baghouse Operation:
    - ☒ Continuous
    - ☐ Automatic
    - ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24; Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %; Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 1,160 ACFM at 70 °F and 14.7 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: 70 °F
19. Fan Requirements: 2 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O; Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Clay

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	78.50	NA	0.0785	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0	99.9
2 – 4	0.647	100
4 – 6	2.315	
6 – 8	3.563	
8 – 10	5.811	
10 – 12	3.787	
12 – 16	8.665	
16 – 20	8.755	
20 – 30	11.748	
30 – 40	7.37	
40 – 50	3.789	
50 – 60	8.015	
60 – 70	4.198	
70 – 80	4.205	
80 – 90	4.14	
90 – 100	0	
>100	23.02	

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

Source: 51 Mill Recycle (Bin Vent)
Emission Point I.D.: 43

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): HP-780304

Equipment Information and Filter Characteristics

1. Manufacturer: Hosokawa Mirropul Environmental Systems
   Model No. 12-55PB

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 10 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 5.637 in.
   Length 5.08 (61 in.) ft.

8. Total cloth area: 413 ft^2

9. Number of bags: 12

10. Operating air to cloth ratio: 1.6:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 650 ACFM at 100 °F and 8 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 100 °F

19. Fan Requirements: 2 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.92	NA	0.0069	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0.5	99.9
2 – 4	4.2	100
4 – 6	9.3	
6 – 8	9.2	
8 – 10	6.0	
10 – 12	6.5	
12 – 16	14.3	
16-20	16.2	
20-30	21.8	
30-40	10.6	
40-50	1.4	
50 – 60	0	
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back in to process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% for less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily:
Collector – Check exhaust for visible dust.
Compressed Air System – Check for air leakage (low pressure).Check valves.
Manometer – Check and record reading.
Weekly
Filter Bags- Check for tears, holes, proper fastening
Hopper – Check for bridging or plugging; clean out
Annual – Inspect the collector thoroughly, clean collector, touch up paint where necessary

Source: West 2nd Stage FBD
Emission Point I.D.: 018

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DF-760018

Equipment Information and Filter Characteristics

1. Manufacturer: Witte
   Model No.

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify

6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☐ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton — Weight: 16 oz./sq.yd
   - ☐ Teflon — Thickness: in
   - ☐ Others, specify

7. Bag Dimension:
   - Diameter: 4 5/8 in.
   - Length: 8.3 (100 in) ft.

8. Total cloth area: 2,754 ft^2

9. Number of bags: 270

10. Operating air to cloth ratio: 6.54:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   - ☐ Mechanical Shaker
   - ☐ Pneumatic Shaker
   - ☐ Bag Collapse
   - ☐ Manual Cleaning
   - ☐ Sonic Cleaning
   - ☐ Reverse Air Flow
   - ☐ Pulse Jet
   - ☐ Reverse Jet
   - ☒ Reverse Air Jet
   - ☐ Other:

13. Cleaning initiated by:
   - ☒ Timer
   - ☐ Expected pressure drop range in. of water
   - ☐ Frequency if timer actuated
   - ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 18,000 ACFM at 150 °F and 14.7 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 150 °F

19. Fan Requirements: 2 hp
    OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
    Low 4 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Organo Clay Based Rhelogical Additive

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	2,205	NA	0.13	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: West 1st Stage FBD
Emission Point I.D.: 017

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DF-760017

Equipment Information and Filter Characteristics

1. Manufacturer: Witte
   Model No. NA

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☐ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☒ Others, specify Aramid Felt

7. Bag Dimension:
   Diameter 4 5/8 in.
   Length 8.33 (100 in) ft.

8. Total cloth area: 2,754 ft^2

9. Number of bags: 270

10. Operating air to cloth ratio: 6.54:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 18,000 ACFM at 150 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 150 °F

19. Fan Requirements: 30 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low 4 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Organo Clay Based Rhelogical Additive

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	2,205	NA	0.13	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: East 1st Stage FBD
Emission Point I.D.: 019

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DF-760019

Equipment Information and Filter Characteristics

1. Manufacturer: Witte
   Model No. NA

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☐ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☒ Others, specify Aramid Felt

7. Bag Dimension:
   Diameter 4 5/8 in.
   Length 8.33 (100 in) ft.

8. Total cloth area: 2,754 ft^2

9. Number of bags: 270

10. Operating air to cloth ratio: 6.54:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 18,000 ACFM at 150 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 150 °F

19. Fan Requirements: 30 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low 4 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Organo Clay Based Rhelogical Additive

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	2,205	NA	0.013	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: East 2nd Stage FBD
Emission Point I.D.: 020

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DF-760020

Equipment Information and Filter Characteristics

1. Manufacturer: Witte
   Model No. NA

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☐ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4 5/8 in.
   Length 8.33 (100 in) ft.

8. Total cloth area: 2,754 ft^2

9. Number of bags: 270

10. Operating air to cloth ratio: 6.54:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 18,000 ACFM at 150 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 150 °F

19. Fan Requirements: 30 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low 4 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Organo Clay Based Rhelogical Additive

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	2,205	NA	0.013	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspected once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Vacuum Pumps and Quat Tanks
Emission Point I.D.: 7-17B

Attachment M
Air Pollution Control Device Sheet
(AFTERBURNER SYSTEM)

Control Device ID No. (must match Emission Units Table): CO-320001

Equipment Information

1. Manufacturer: Wheelbrator Model No. C-5000 PAB-G50 TE	2. ☐ Thermal Energy Recovery ☐ Recuperative (Conventional) ☒ Catalytic
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. Combustion chamber dimensions: Length: 11.58 ft Diameter: 5.36 x 5.36 ft Cross-sectional area: 28.7 ft^2	5. Stack Dimensions: Height: 55 ft Diameter: 2.125 ft
6. Combustion (destruction) efficiency: Estimated: 95 % Minimum guaranteed: 95 %	7. Retention or residence time of materials in combustion chamber: Maximum: 1.9 sec Minimum: 1.9 sec
8. Throat diameter: 1.71 x 1.46 ft	9. Combustion Chamber Volume: ft^3
10. Fuel used in burners: ☒ Natural Gas ☐ Fuel Oil, Number: ☐ Other, specify:	11. Burners per afterburner: Number of burners: 1 BTU/hr for burner: 3,000,000 BTU/hr
12. Fuel heating value of natural gas: BTU/lb	13. Flow rate of natural gas: 180,000 ft^3/min
14. Is a catalyst material used?: ☒ Yes ☐ No If yes, catalyst material used:	15. Expected frequency of catalyst replacement: 1 yr(s) 16. Date catalyst was last replaced: Month/Year: February 2014
17. Space Velocity of the catalyst material used: 1/hour	18. Catalyst area: 28.78 ft^2 19. Volume of catalyst bed: 13.19 ft^3
20. Minimum loading: Maximum loading:	21. Temperature catalyst bed inlet: 600 °F Temperature catalyst bed outlet: 675°F
22. Explain degradation or performance indicator criteria determining catalyst replacement: Temperature and pressure drop are monitored. Catalyst depth is checked based on these values. Additional catalyst is added to maintain the 5.5 inch depth. Catalyst is typically added every 6 to 12 months.	
23. Heat exchanger used? ☒ Yes ☐ No Describe heat exchanger:	24. Heat exchanger surface area? ft^2 25. Average thermal efficiency: %
26. Temperature of gases: After preheat: 1000 °F Before preheat: 180 °F	
27. Dilution air flow rate: ft^3/minute	
28. Describe method of gas mixing used:	

Waste Gas (Emission Stream) to be Burned

29.

Name	Quantity Grains of H_2S/100 ft^2	Quantity-Density (LB/hr, ft^3/hr, etc)	Source of Material
Ethanol/VOC	NA	140.80 lb/hr	Vacuum Pumps (7-17A)
Methyl Chloride/VOC	NA	1.30 lb/hr	Vacuum Pumps (7-17A)
Ethanol/VOC	NA	29.78 lb/hr	Quat Tanks (28, 29, 30, 32, 33, 34)

30. Estimate total combustibles to afterburner 170.60 lb/hr or ACF/hr

31. Estimated total flow rate to afterburner or catalyst including materials to be burned, carrier gases, auxiliary fuel, etc.: lb/hr, ACF/hr, or scfm
Total flow rate = Flue gas flow rate

32. Afterburner operating parameters:

	During maximum operation of feeding unit(s)	During typical operation of feeding unit(s)	During minimum operation of feeding unit(s)
Combustion chamber temperature in °F	600	600	600
Emission stream gas temperature in			
Combined gas stream entering catalyst bed in			
Flue stream leaving the catalyst bed			
Emission stream flow rate (scfm)			
Efficiency (VOC Reduction)	95 %	95 %	95 %
Efficiency (Other; specify contaminant)	95 %	95 %	95 %

33. Inlet Emission stream parameters:

	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):		
Oxygen Content (%):	10.2%	10.2%
Moisture Content (%):	50.85%	50.85%

Are halogenated organics present? ☒ Yes ☐ No
Are particulates present? ☐ Yes ☐ No
Are metals present? ☐ Yes ☒ No

34. For thermal afterburners, is the combustion chamber temperature continuously monitored and recorded? ☐ Yes ☐ No

35. For catalytic afterburners, is the temperature rise across the catalyst bed continuously monitored and recorded? ☒ Yes ☐ No

36. Is the VOC concentration of exhaust monitored and recorded? ☐ Yes ☒ No

37. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
Inlet gas is pre-heated by the heat exchanger.

38. Describe the collection material disposal system:
The catalyst is consumed.

39. Have you included ***Afterburner Control Device*** in the Emissions Points Data Summary Sheet? Yes

40. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None Proposed	Hours of operation Date, time, and length of any start-up, shut-down, and/or malfunctions. Maintain records for 5 years.
REPORTING:	TESTING:
None Proposed	None Proposed

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

41. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
NA

42. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
95%

43. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Flash Dryer System
Emission Point I.D.: 3

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-751500

Equipment Information and Filter Characteristics

1. Manufacturer: Mirropul
   Model No. 500T-10 TRH

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 18 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.67 in.
   Length 124 ft.

8. Total cloth area: 6,325 ft^2

9. Number of bags: 500

10. Operating air to cloth ratio: 3.95:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 25,000 ACFM at 210 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 230 °F

19. Fan Requirements: 150 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 5 in. H_2O
   Low 1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	3,675	NA	0.44	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0.5	99.9
2 – 4	4.2	100
4 – 6	9.3	
6 – 8	9.2	
8 – 10	6.0	
10 – 12	6.5	
12 – 16	14.3	
16 – 20	16.2	
20 – 30	21.8	
30 – 40	10.6	
40 – 50	1.4	
50 – 60	0	
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspected once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: ACM #1 Mill
Emission Point I.D.: 16

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-750029

Equipment Information and Filter Characteristics

1. Manufacturer: Mikro-Pulsaire
   Model No. 815-8-20

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.625 in.
   Length 8 ft.

8. Total cloth area: 942 ft^2

9. Number of bags: 81

10. Operating air to cloth ratio: 4.78:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 4,500 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 100 °F

19. Fan Requirements: 75 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2	5.0	99.9%
2 – 4	8.8	100%
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0.0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year.

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: ACM #2 Feed Bin (Bin Vent)
Emission Point I.D.: 42

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-753400

Equipment Information and Filter Characteristics

1. Manufacturer: Hosokawa Mirropul Environmental Systems
   Model No. 12-55PB
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 10 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   Diameter 5.64 in.
   Length 5.08 (61 in) ft.
8. Total cloth area: 413 ft^2
9. Number of bags: 12
10. Operating air to cloth ratio: 1.6:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 650 ACFM at 100 °F and 8 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: 100 °F
19. Fan Requirements: 2 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (*if* particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0.5	99.9
2 – 4	4.2	
4 – 6	9.3	
6 – 8	9.2	
8 – 10	6.0	
10 – 12	6.5	
12 – 16	14.3	
16 – 20	16.2	
20 – 30	21.8	100
30 – 40	10.6	
40 – 50	1.4	
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back in to process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% for less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily:
Collector – Check exhaust for visible dust.
Compressed Air System – Check for air leakage (low pressure).Check valves.
Manometer – Check and record reading.
Weekly:
Filter Bags- Check for tears, holes, proper fastening.
Hopper – Check for bridging or plugging; clean out.
Annual – Inspect the collector thoroughly, clean collector, touch up paint where necessary.

Source: ACM #1 Feed Bin (Bin Vent)
Emission Point I.D.: 41

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-752500

Equipment Information and Filter Characteristics

1. Manufacturer: Hosokawa Mirropul Environmental Systems
   Model No. 12-55PB
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 10 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   - Diameter 5.64 in.
   - Length 5.08 (61 in) ft.
8. Total cloth area: 413 ft^2
9. Number of bags: 12
10. Operating air to cloth ratio: 1.6:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 650 ACFM at 100 °F and 8 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: 100 °F
19. Fan Requirements: 2 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2	0.5	99.9
2 – 4	4.2	100
4 – 6	9.3	
6 – 8	9.2	
8 – 10	6.0	
10 – 12	6.5	
12 – 16	14.3	
16 – 20	16.2	
20 – 30	21.8	
30 – 40	10.6	
40 – 50	1.4	
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily:
Collector – Check exhaust for visible dust.
Compressed Air System – Check for air leakage (low pressure).Check valves.
Manometer – Check and record reading.
Weekly:
Filter Bags- Check for tears, holes, proper fastening.
Hopper – Check for bridging or plugging; clean out.
Annual – Inspect the collector thoroughly, clean collector, touch up paint where necessary.

Source: ACM #2 Mill
Emission Point I.D.: 5

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-750030

Equipment Information and Filter Characteristics

1. Manufacturer: Micropul
   Model No. 1005-8-50-TR-C

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify

6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 16 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify

7. Bag Dimension:
   Diameter 4.625 in.
   Length 8 ft.

8. Total cloth area: 968 ft^2

9. Number of bags: 100

10. Operating air to cloth ratio: 4.65 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   - ☐ Mechanical Shaker
   - ☐ Pneumatic Shaker
   - ☐ Bag Collapse
   - ☐ Manual Cleaning
   - ☐ Sonic Cleaning
   - ☐ Reverse Air Flow
   - ☐ Pulse Jet
   - ☐ Reverse Jet
   - ☒ Reverse Air Jet
   - ☐ Other:

13. Cleaning initiated by:
   - ☒ Timer
   - ☐ Expected pressure drop range in. of water
   - ☐ Frequency if timer actuated
   - ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 4,500 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: °F

19. Fan Requirements: 75 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9%
2 – 4	8.8	100%
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Pug Mill Vacuum Cleaner
Emission Point I.D.: 10

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): PV-780303

Equipment Information and Filter Characteristics

1. Manufacturer: Mikro-Pulsair
   Model No. 7-55PB-220C

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.5 in.
   Length 4.58 (55 in) ft.

8. Total cloth area: 92 ft^2

9. Number of bags: 7

10. Operating air to cloth ratio: 2.2 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.9 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 200 ACFM at 220 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 100 °F

19. Fan Requirements: 7.5 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5 (emissions include DC-780401)	13.85	NA	0.0138	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0.5	99.9
2 – 4	4.2	
4 – 6	9.3	
6 – 8	9.2	
8 – 10	6.0	
10 – 12	6.5	
12 – 16	14.3	
16 – 20	16.2	
20 – 30	21.8	100
30 – 40	10.6	
40 – 50	1.4	
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Material is returned to the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Pug Mill Feed Hopper (Bin Vent)
Emission Point I.D.: 9C

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-780201

Equipment Information and Filter Characteristics

1. Manufacturer: Rage Inc.
   Model No. 37R3

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 5 in.
   Length 3.17 (38 in.) ft.

8. Total cloth area: 163 ft^2

9. Number of bags: 37

10. Operating air to cloth ratio: 5:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 1,160 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 70 °F

19. Fan Requirements: 2 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.92	NA	0.0069	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	0.8	99.9
2 – 4	34.8	100
4 – 6	18.4	
6 – 8	9.2	
8 – 10	2.7	
10 – 12	1.3	
12 – 16	32.8	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: visual inspection, bags changed once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
None

RECORDKEEPING:
None

REPORTING:
None

TESTING:
None

MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Haver C Packer
Emission Point I.D.: 009

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-790001

Equipment Information and Filter Characteristics

1. Manufacturer: MAC
   Model No. 18AZR14

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 5.75 in.
   Length 8 ft.

8. Total cloth area: 265 ft^2

9. Number of bags: 25 reg.

10. Operating air to cloth ratio: 3.4:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 900 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: Ambient °F

19. Fan Requirements: 10 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.92	NA	0.0069	NA

25. Complete the table: Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9%
2 – 4	8.8	100%
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0.0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Haver A Packer
Emission Point I.D.: 13

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-770025

Equipment Information and Filter Characteristics

1. Manufacturer: Micropul
   Model No. 81S-8-20

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 4.625 in.
   Length 8 ft.

8. Total cloth area: 784 ft^2

9. Number of bags: 81

10. Operating air to cloth ratio: 5.10:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24
   Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 4,000 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: Ambient °F

19. Fan Requirements: 75 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 4 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9%
2 – 4	8.8	100%
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: C Bag Dump Station
Emission Point I.D.: 46

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-780100

Equipment Information and Filter Characteristics

1. Manufacturer: Rage Engineering
   Model No. NA

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify

6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 11 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify

7. Bag Dimension:
   Diameter 5 in.
   Length 2.04 (24.5) ft.

8. Total cloth area: 673 ft^2

9. Number of bags: 21

10. Operating air to cloth ratio: 6.8:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   - ☐ Mechanical Shaker
   - ☐ Pneumatic Shaker
   - ☐ Bag Collapse
   - ☐ Manual Cleaning
   - ☐ Sonic Cleaning
   - ☐ Reverse Air Flow
   - ☐ Pulse Jet
   - ☐ Reverse Jet
   - ☒ Reverse Air Jet
   - ☐ Other:

13. Cleaning initiated by:
   - ☒ Timer
   - ☐ Expected pressure drop range in. of water
   - ☐ Frequency if timer actuated
   - ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 1,081 ACFM at 70 °F and atm PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: Ambient °F

19. Fan Requirements: 5 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.28	NA	0.0063	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0.01	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
NA

Source: Haver C Packing Hopper (Bin Vent)
Emission Point I.D.: 47

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-790000

Equipment Information and Filter Characteristics

1. Manufacturer: Smoot
   Model No. 18AVRC14
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 8 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   Diameter 5.63 in.
   Length 3.78 (45.38 in.) ft.
8. Total cloth area: 221 ft^2
9. Number of bags: 9
10. Operating air to cloth ratio: 1.4:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 300 ACFM at 70 °F and 14.7 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: Ambient °F
19. Fan Requirements: 3 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.92	NA	0.0069	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure.
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: Long Compressor
Emission Point I.D.: 49

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC 752010

Equipment Information and Filter Characteristics

1. Manufacturer: Torit Dust Collector
   Model No. DFT2-4

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☐ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 16 oz./sq.yd
   ☐ Teflon Thickness in
   ☒ Others, specify Ultra-Web (cellulose)

7. Bag Dimension:
   Diameter 13.875 in.
   Length 2.17 (26 in.) ft.

8. Total cloth area: 1,016 ft^2

9. Number of bags: 4

10. Operating air to cloth ratio: 2.26:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 2,300 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: 100 °F

19. Fan Requirements: 3 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	5.0	99.9
2 – 4	8.8	100
4 – 6	13.9	
6 – 8	17.5	
8 – 10	20.7	
10 – 12	22.7	
12 – 16	11.4	
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure.
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: Haver A Packing Hopper (Vent)
Emission Point I.D.: 44

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-770021

Equipment Information and Filter Characteristics

1. Manufacturer: Smoot (Tech Air)
   Model No. SBV-9-1-1/2r1S

2. Total number of compartments: 1

3. Number of compartment online for normal operation: 1

4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

5. Baghouse Configuration: (check one)
   ☒ Open Pressure ☐ Closed Pressure ☐ Closed Suction
   ☐ Electrostatically Enhanced Fabric
   ☐ Other, Specify

6. Filter Fabric Bag Material:
   ☐ Nomex nylon ☐ Wool
   ☒ Polyester ☐ Polypropylene
   ☐ Acrylics ☐ Ceramics
   ☐ Fiber Glass
   ☐ Cotton Weight 10 oz./sq.yd
   ☐ Teflon Thickness in
   ☐ Others, specify

7. Bag Dimension:
   Diameter 5.75 in.
   Length 1.5 (18 in.) ft.

8. Total cloth area: 135 ft^2

9. Number of bags: 12

10. Operating air to cloth ratio: 2.3:1 ft/min

11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent

12. Method used to clean bags:
   ☐ Mechanical Shaker ☐ Sonic Cleaning ☒ Reverse Air Jet
   ☐ Pneumatic Shaker ☐ Reverse Air Flow ☐ Other:
   ☐ Bag Collapse ☐ Pulse Jet
   ☐ Manual Cleaning ☐ Reverse Jet

13. Cleaning initiated by:
   ☒ Timer
   ☐ Expected pressure drop range in. of water ☐ Frequency if timer actuated
   ☐ Other

14. Operation Hours: Max. per day: 24 Max. per yr: 365

15. Collection efficiency: Rating: 99.99 %
   Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 305 ACFM at 70 °F and 14.7 PSIA
   ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA

17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air

18. Gas Stream Temperature: °F

19. Fan Requirements: 2 hp
   OR ft^3/min

20. Stabilized static pressure loss across baghouse. Pressure Drop: High 7 in. H_2O
   Low <1 in. H_2O

21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):
Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	5.77	NA	0.0058	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 1	0	99.99% to 1 micron
1 – 5	1.708	
5 – 10	11.479	
10 – 20	33.924	
20 – 40	34.726	
40 – 50	8.795	
>100	2.785	

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99 % less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure.
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: Anion Addition
Emission Point I.D.: 20

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): TK-750310

Equipment Information and Filter Characteristics

1. Manufacturer: Mac Process Inc.
   Model No. 19AVRC14
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 8 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   Diameter 5.95 in.
   Length 1.58 (19 in.) ft.
8. Total cloth area: 239 ft^2
9. Number of bags: 14
10. Operating air to cloth ratio: 1.3:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☐ Pulse Jet
    - ☐ Reverse Jet
    - ☒ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99 %
    Guaranteed minimum: 1 µm 99.99 %

Gas Stream Characteristics

16. Gas flow rate into the collector: 300 ACFM at 70 °F and 14.7 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: lb. Water/lb. Dry Air
18. Gas Stream Temperature: °F
19. Fan Requirements: 15 hp
    OR ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop: High 8 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Bentone™ product

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	6.28	NA	0.0063	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2		99.9
2 – 4		100
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20	0	
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☐ Pressure Drop
- ☐ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Visually inspect bags once per year

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
Recycled back into the process.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet? Yes

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
99.99% less than 1 micron.

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Daily - Check unit differential pressure.
Weekly – Check timer and solenoid valves for function. This usually is only listening to check uniform time interval between blasts.
Monthly – lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
Quarterly – inspect bags for "soft to hand" condition and uniform tightness of clamps.

Source: Receiver Bulk Bag Hopper (Bin Vent)
Emission Point I.D.: 40

Attachment M
Air Pollution Control Device Sheet
(BAGHOUSE)

Control Device ID No. (must match Emission Units Table): DC-770135

Equipment Information and Filter Characteristics

1. Manufacturer: Smoot
   Model No. 72BB9
2. Total number of compartments: 1
3. Number of compartment online for normal operation: 1
4. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.
5. Baghouse Configuration: (check one)
   - ☒ Open Pressure
   - ☐ Closed Pressure
   - ☐ Closed Suction
   - ☐ Electrostatically Enhanced Fabric
   - ☐ Other, Specify
6. Filter Fabric Bag Material:
   - ☐ Nomex nylon
   - ☐ Wool
   - ☒ Polyester
   - ☐ Polypropylene
   - ☐ Acrylics
   - ☐ Ceramics
   - ☐ Fiber Glass
   - ☐ Cotton Weight 16 oz./sq.yd
   - ☐ Teflon Thickness in
   - ☐ Others, specify
7. Bag Dimension:
   Diameter 5.75 in.
   Length 6.17 (74 in.) ft.
8. Total cloth area: 86.79 ft^2
9. Number of bags: 9
10. Operating air to cloth ratio: 24.03:1 ft/min
11. Baghouse Operation: ☒ Continuous ☐ Automatic ☐ Intermittent
12. Method used to clean bags:
    - ☐ Mechanical Shaker
    - ☐ Pneumatic Shaker
    - ☐ Bag Collapse
    - ☐ Manual Cleaning
    - ☐ Sonic Cleaning
    - ☐ Reverse Air Flow
    - ☒ Pulse Jet
    - ☐ Reverse Jet
    - ☐ Reverse Air Jet
    - ☐ Other:
13. Cleaning initiated by:
    - ☒ Timer
    - ☐ Expected pressure drop range in. of water
    - ☐ Frequency if timer actuated
    - ☐ Other
14. Operation Hours: Max. per day: 24 Max. per yr: 365
15. Collection efficiency: Rating: 99.99%
    Guaranteed minimum: 1µm 99.99%

Gas Stream Characteristics

16. Gas flow rate into the collector: 350 SCFM ACFM at 70°F and 20.2 PSIA
    ACFM: Design: PSIA Maximum: PSIA Average Expected: PSIA
17. Water Vapor Content of Effluent Stream: Minimal > 0.1 lb. Water/lb. Dry Air
18. Gas Stream Temperature: 70°F
19. Fan Requirements: 2 hp
    OR 700 ft^3/min
20. Stabilized static pressure loss across baghouse. Pressure Drop:
    High 10 in. H_2O
    Low <1 in. H_2O
21. Particulate Loading: Inlet: grain/scf Outlet: grain/scf

22. Type of Pollutant(s) to be collected (if particulate give specific type):

Particulate Clay Based Rheological Material

23. Is there any SO_3 in the emission stream? ☒ No ☐ Yes SO_3 content: ppmv

24. Emission rate of pollutant (specify) into and out of collector at maximum design operating conditions:

Pollutant	IN		OUT	
	lb/hr	grains/acf	lb/hr	grains/acf
PM/PM10/PM2.5	4.71	NA	0.0047	NA

25. Complete the table:

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 1	0	99.99% to 1 micron
1 – 5	1.708	
5 – 10	11.479	
10 – 20	33.924	
20 – 40	34.726	
40 – 50	8.795	
>100	2.785	

26. How is filter monitored for indications of deterioration (e.g., broken bags)?
- ☐ Continuous Opacity
- ☒ Pressure Drop
- ☒ Alarms-Audible to Process Operator
- ☐ Visual opacity readings, Frequency:
- ☒ Other, specify: Broken Bag Detector

27. Describe any recording device and frequency of log entries:
None

28. Describe any filter seeding being performed:
None

29. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
None

30. Describe the collection material disposal system:
This is a bagging unit. The material collected is transferred to the bulk sack.

31. Have you included ***Baghouse Control Device*** in the Emissions Points Data Summary Sheet?

32. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
None	None
REPORTING:	TESTING:
None	None

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

33. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

None

34. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

99.9%

35. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

NA

Ingestion: Calcium hypochlorite, if swallowed, causes severe burns to the digestive tract and can be fatal.

CHRONIC:

Genotoxicity: Calcium hypochlorite produced positive responses in in-vitro assays using bacterial systems (the Ames test) and chromosomal aberrations in Chinese hamster fibroblasts. In a whole animal experiment (mouse micronucleus test), exposures ranging from 20 to 160 mg/kg produced no compound related chromosomal abnormalities.

Carcinogenisis: Although no study has been conducted with calcium hypochlorite, the carcinogenic potential of sodium hypochlorite was studied in F344 rats. After 104 weeks of drinking water containing up to 2000 ppm sodium hypochlorite, there was no evidence that this chemical produced any carcinogenic response. In addition, this exposure did not result in any adverse effects in blood, clinical chemistry, or other target organs.

One of the major uses of calcium hypochlorite is as a source of chlorine for water sanitization in drinking and recreational water. Studies have been conducted to determine the long-term effects of chlorinated drinking water. Seven generations of rats were given 100 ppm chlorine in their drinking water. No difference in fertility, growth, blood parameters, or specific organ toxicity was observed between control and exposed animals. Two separate animal studies conducted by different government agencies determined that the chlorination of municipal drinking water did not result in toxicity to the developing mouse fetus.

Safe handling of this material on a long-term basis should emphasize minimizing repeated acute exposures.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
Highly toxic to aquatic life. 0.088 mg/l (Bluegill) 96-hour LC50

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Spilled material that has been swept up and dissolved in water should be used immediately in the normal application for which this product is being used. If this is not possible, carefully neutralize dissolved material by adding hydrogen peroxide (one pint of 35% hydrogen peroxide solution per pound of calcium hypochlorite to be neutralized) then dilute the neutralized material with plenty of water and flush to sewer. Note: Only properly neutralized material should be flushed to sewer. Unneutralized material can cause environmental damage to receiving water or can interfere with treatment plant operation. For on-site neutralization, carefully and slowly pour the appropriate quantity of 35% hydrogen peroxide solution over all spilled material then flush area with plenty of water. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their

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containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, as well as any other relevant Federal, State, or local laws/regulations regarding disposal.

RCRA:
Waste calcium hypochlorite and contaminated soils/materials from spill cleanup are D001 hazardous waste as per 40 CFR 261.21(a)(4) and must be disposed of accordingly under RCRA.

14. TRANSPORT INFORMATION

USA DOT DESCRIPTION:

Proper Shipping Name:	Calcium Hypochlorite, Hydrated
Hazard Class:	5.1 (Oxidizer)
Identification Number:	UN2880
Packing Group:	II
Reportable Quantity:	10 lbs./4.5 kg.

15. REGULATORY INFORMATION

USA TSCA: This product is listed on the TSCA Inventory.
EUROPE EINECS: This product is listed on EINECS.
CANADA DSL: This product is listed on the Canadian DSL.
AUSTRALIA AICS: This product is listed on AICS.
KOREA ECL: This product is listed on ECL.
JAPAN MITI (ENCS): This product is listed on MITI.

SARA TITLE III:
SARA (311, 312) Hazard Class:
Acute Health Hazard. Reactive Hazard. Fire Hazard.
SARA (313) Chemicals:
Not listed.
SARA Section 302:
Not listed as an Extremely Hazardous Substance.

CERCLA HAZARDOUS SUBSTANCE:
Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 10 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center, 800-424-8802.

HAZARD RATING SYSTEM (HMIS/NFPA):
NFPA: Health 3, Flammability 0, Reactivity 1 (Oxidizer)

FIFRA:
This product is registered with EPA as a pesticide.

PPG: 27488 Prestochlor Calcium Hypochlorite Granules 07/18/2001

16. OTHER INFORMATION

Other information:
NSF Drinking Water Treatment Chemicals Listing - PPG calcium hypochlorite is certified for maximum use at 15 mg/L under ANSI/NSF Standard 60.

The following has been revised since the last issue of this MSDS:
Date. Edition. Section 4 has been updated. Section 16 has been updated.

Previous revision date: 06/15/1998
Previous edition number: 007

NA = Not Available

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Liquid Caustic Soda, 50%
PRODUCT ID: 0014
SYNONYMS: Liquid Caustic Soda; Sodium Hydroxide; NaOH
ISSUE DATE: 07/15/2002
EDITION NO.: 20

PPG Industries, Inc.
One PPG Place, Pittsburgh, PA 15272, USA
24-hour Emergency Telephone Number: 1-304-843-1300
For Product Information (8am-5pm Eastern time):
1-800-243-6774 (C/A)

PREPARER: Product Safety, Chemicals

2. COMPOSITION/INFORMATION ON INGREDIENTS

Material/CAS Number	Percent
Sodium Hydroxide 1310-73-2	50
Water 7732-18-5	50

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! Corrosive - Causes severe burns to eyes and skin.

Precautions: Do not get in eyes, on skin, or on clothing. Corrosive to skin. Even a small amount in the eye can cause blindness. Do not swallow. Avoid breathing dusts or mists from solutions. Use only with adequate ventilation. Ventilation must be sufficient to limit employee exposure to this product below permissible exposure limits. When making solutions or diluting, only add caustic soda slowly to surface of cold water while stirring. Do not add to warm or hot water, a violent eruption or explosive reaction can result. Avoid contact with organic materials and concentrated acids - may cause violent reactions. Caustic soda reacts with magnesium, aluminum, zinc (galvanized), tin, chromium, brass and bronze, generating hydrogen which is explosive. Caustic soda may react with various sugars to generate carbon monoxide. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed vessels and can cause death. Wash thoroughly

after handling. Do not eat, drink or smoke in work area. Liquid caustic soda is shipped hot (100-180 F). Avoid skin contact -- can cause thermal burns.

4. FIRST AID MEASURES

INHALATION: Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

EYE/SKIN CONTACT: EYE: Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. Contact a poison control center, emergency room or physician right away as further treatment will be necessary. SKIN: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. Contact a poison control center, emergency room or physician right away as further treatment will be necessary. If skin feels slippery, this product may still be present in sufficient quantities to cause rash or burn. Continue washing until slick skin feeling is gone. Thoroughly clean contaminated clothing and shoes before reuse or discard.

INGESTION: Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Do Not induce vomiting. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

5. FIRE FIGHTING MEASURES

FLASH POINT: None

EXTINGUISHING MEDIA: Not applicable.

SPECIAL FIREFIGHTING PROCEDURES: Contact with some metals (particularly magnesium, aluminum and galvanized zinc) can rapidly generate hydrogen, which is explosive.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Only trained personnel equipped with NIOSH approved, full facepiece combination dust/mist respirators should be permitted in area. For dry material, use appropriate methods, shovels, brooms, and vacuums to clean up the spill. If mixed with water, or likely to become mixed with water or any liquid, dike area to contain spill. Reclaim if possible. Or, dilute spill with large amounts of water then neutralize with dilute acid. Use vacuum truck to pick up neutralized material for proper disposal. Properly neutralized liquid residues (pH 6 to 9) may be disposed of in waste water treatment facilities which allow the discharge of neutral salt solutions. After all visible traces have been removed, flush area with large amounts of water.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:
Wear appropriate personal protective equipment when handling this product. Never touch eyes or face with hands or gloves that may be contaminated with this product. When making solutions or

diluting, only add caustic soda slowly to surface of cold water while stirring. Do not add to warm or hot water, a violent eruption or explosive reaction can result. Avoid contact with organic materials and concentrated acids - may cause violent reactions. Caustic soda reacts with magnesium, aluminum, zinc (galvanized), tin, chromium, brass and bronze, generating hydrogen which is explosive. Caustic soda may react with various sugars to generate carbon monoxide. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed vessels and can cause death. Follow appropriate tank entry procedures (see ANSI Z177.1 - 1977). Do not enter a storage tank or container (truck or rail) that has contained this product, even if it appears empty. Liquid caustic soda is shipped hot (100-180 °F). Avoid skin contact -- can cause thermal burns.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:
8-hour Time Weighted Average (TWA); 15-minute Short-Term Exposure Limit (STEL)

OSHA: 2 mg/cu.m. Ceiling. 29 CFR 1910.1000 (Rev. 3/1/89).

RESPIRATORY PROTECTION: Use a NIOSH approved dust/mist filter respirator for all routine activities when exposure to dusts/mists exceed the permissible exposure limits. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

VENTILATION: Use local exhaust sufficient to maintain dust/mist levels below permissible exposure limits.

EYE AND FACE PROTECTION: Close fitting chemical safety goggles with faceshield.

PROTECTIVE GLOVES: Nitrile. Neoprene. Natural rubber.

OTHER PROTECTIVE EQUIPMENT: Rubber boots with safety toes, rubber aprons, PVC clothing, and plastic hard hats should be used when necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 (general requirements), .133 (eye and face protection), and .138 (hand protection).

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT:	142°C
VAPOR DENSITY (Air=1):	NA
SPECIFIC GRAVITY (Water=1):	1.530 @ 60/60°F
pH:	Strongly basic
FREEZING/MELTING POINT:	5-11°C (41-51°F)
SOLUBILITY (wt.% in water):	347g/100g water @ 100°C
BULK DENSITY:	12.76 lbs/gal @ 60°F
VOLUME % VOLATILE:	50
VAPOR PRESSURE:	1 mm Hg
EVAPORATION RATE:	NA
HEAT OF SOLUTION:	Exothermic

PPG: 0014 Liquid Caustic Soda, 50% 07/15/2002

PHYSICAL STATE: Liquid
ODOR: Odorless
COLOR: Water white to slightly turbid

10. STABILITY AND REACTIVITY

STABILITY: Stable.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY (CONDITIONS/MATERIALS TO AVOID):
Contact with organic materials and concentrated acids may cause violent reactions. Contact with magnesium, aluminum, galvanized zinc, tin, chromium, brass and bronze generates explosive hydrogen. Reactions with various food sugars may form carbon monoxide.

HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:
Carbon monoxide.

11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION LC50: Corrosive
SKIN IRRITATION: Corrosive.
EYE IRRITATION: Corrosive.
ACUTE ORAL LD50: LDLo (rabbit) 500 mg/kg. Corrosive.

CHRONIC EFFECTS/CARCINOGENICITY: This product is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

MEDICAL CONDITIONS AGGRAVATED: None known.

EFFECTS OF OVEREXPOSURE:

ACUTE:

Eye/Skin: Causes severe burns to the eyes. Small quantities can result in permanent damage and/or loss of vision. For skin contact, corrosive action causes burns and frequently deep ulcerations with subsequent scarring. Prolonged contact destroys tissue. Dust or mist from solutions can cause irritant dermatitis.

Ingestion: Ingestion either in solid or liquid form can cause very serious damage to the mucous membranes or other tissues with which contact is made, and may be fatal.

Inhalation: Inhalation of dusts or mists can cause damage to the upper respiratory tract and to the lung tissue depending on severity of exposure. Effects can range from mild irritation of mucous membranes, severe pneumonitis and destruction of lung tissues.

CHRONIC: The effects of long-term, low level exposures to this product have not been determined.

Safe handling of this material on a long-term basis should emphasize the prevention of all contact with this material to avoid any effects from repetitive acute exposures.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
Highly toxic to aquatic life. 240 ug/l (Bluegill) 96-hour TLM LC50

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Waste material must be disposed of in accordance with federal, state, provincial, and local environmental control regulations. Empty containers should be recycled or disposed of through an approved waste management facility. PPG recommends disposal of dry residues in an approved hazardous waste management facility or by neutralizing and disposing of according to local or permitted regulations.

14. TRANSPORT INFORMATION

Proper Shipping Name: Sodium Hydroxide, Solution
Hazard Class: 8 (Corrosive)
UN Number: UN1824
Packing Group: II
USA-RQ, Hazardous Substance and Quantity: 1000 lbs./454 kg

15. REGULATORY INFORMATION

USA TSCA: All components of this product are listed on the TSCA Inventory.
EUROPE EINECS: All components in this product are listed on EINECS.
CANADA DSL: This product and/or all of its components are listed on the Canadian DSL.
AUSTRALIA AICS: All components of this product are listed on AICS.
KOREA ECL: All components in this product are listed on the Korean Existing Chemicals Inventory (KECI).
JAPAN MITI (ENCS): All components of this product are listed on MITI.
PHILIPPINES PICCS: All of the components in this product are listed on the Philippines Inventory of Chemicals and Chemical Substances (PICCS).

SARA TITLE III:
SARA (311, 312) Hazard Class:
Acute Health Hazard. Reactive Hazard.
SARA (313) Chemicals:
Not listed.
SARA Extremely Hazardous Substance:
Not listed.

CERCLA Hazardous Substance:
Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 1000 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center, 800-424-8802.

PPG:	0014 Liquid Caustic Soda, 50%	07/15/2002

RCRA:
Not listed.

CANADA REGULATIONS (WHMIS): Class E - Corrosive Material. Sensitization to product: None known. Reproductive toxicity: None known. Odor threshold: No odor. Product use: Neutralization, chemical processing.

HAZARD RATING SYSTEM (HMIS/NFPA):
Health 3, Flammability 0, Reactivity 1

16. OTHER INFORMATION

Other Information:

In case of emergency in Canada, contact PPG Canada, Inc., B.P.2010, Beauharnois, Quebec J6N 3C3, 450-429-3552, or Canutec 613-996-6666. ANSI/NSF Drinking Water Treatment Chemicals - Health Effects Listing - PPG sodium hydroxide/caustic soda is certified for maximum use at 200 mg/l under ANSI/NSF Standard 60.

The following has been revised since the last issue of this MSDS:
Date. Edition. Section 16 has been updated.

Previous revision date: 7/12/2002
Previous edition number: 019

NA = Not Available

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 8103 PLUS

EMERGENCY TELEPHONE NUMBER(S)
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **NALCO 8103 PLUS**

APPLICATION : WATER TREATMENTWATER CLARIFICATION AID

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 0 / 1 FLAMMABILITY : 0 / 1 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Based on our hazard evaluation, none of the substances in this product are hazardous.

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.
Wear suitable protective clothing.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve ammonia (NH4) under fire conditions. May evolve HCl under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. No adverse effects expected.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Remove contaminated clothing. Wash off affected area immediately with plenty of water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. If symptoms develop, seek medical advice.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

If Swallowed: Do not induce vomiting. Drink large quantities of water. Never give anything by mouth to an unconscious or convulsing person.

If in Eyes: Flood eyes with water for at least 15 minutes.

If on Skin: Wash thoroughly soap and water.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : Not flammable

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire. Water mist may be used to cool closed containers.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve ammonia (NH4) under fire conditions. May evolve HCl under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Notify appropriate government, occupational health and safety and environmental authorities. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
This product is toxic to fish. It should not be directly discharged into lakes, ponds, streams, waterways or public water supplies.

7. HANDLING AND STORAGE

HANDLING :
Do not take internally. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labelled. Avoid eye and skin contact.

STORAGE CONDITIONS :
Store separately from oxidizers. Store the containers tightly closed. Protect product from freezing.

SUITABLE CONSTRUCTION MATERIAL :
HDPE (high density polyethylene), Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
Nitrile gloves, PVC gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Viscous liquid
APPEARANCE	Clear Yellow
ODOR	None
SPECIFIC GRAVITY	1.018 - 1.058 @ 77 °F / 25 °C
DENSITY	8.5 - 8.81 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	5.0 - 8.0
VISCOSITY	< 1,050 cps @ 77 °F / 25 °C
FREEZING POINT	14 °F / -9.9 °C
BOILING POINT	> 212 °F / > 100 °C
VAPOR PRESSURE	Same as water
VAPOR DENSITY	Same as water
VOC CONTENT	0.00 % EPA Method 24

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen, May evolve ammonia (NH4) under fire conditions., HCl

11. TOXICOLOGICAL INFORMATION

The following results are for the polymer.

ACUTE ORAL TOXICITY :

Species	LD50	Test Descriptor
Rat	25,500 mg/kg	Similar Product

Rating : Non-Hazardous

ACUTE DERMAL TOXICITY :

Species	LD50	Test Descriptor
Rabbit	> 20,000 mg/kg	40% Active Ingredient

Rating : Non-Hazardous

PRIMARY SKIN IRRITATION :

Draize Score	Test Descriptor
1.0 / 8.0	Similar Product

Rating : Slightly irritating

PRIMARY EYE IRRITATION :

Draize Score	Test Descriptor
8 / 110.0	Similar Product

Rating : Practically non-irritating

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

No toxicity studies have been conducted on this product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	0.85 mg/l	Product tested in clean water
Inland Silverside	96 hrs	> 5,000 mg/l	Product tested in clean water
Zebra Danio	96 hrs	10 - 100 mg/l	Representative polymer tested in water with

			DOC
Fathead Minnow	96 hrs	3.29 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	2.06 mg/l		Product tested in clean water
Ceriodaphnia dubia	48 hrs	1.09 mg/l		Similar product tested in clean water
Ceriodaphnia dubia	48 hrs	2.5 mg/l		Product tested in clean water
Daphnia magna	48 hrs	10 - 100 mg/l		Representative polymer tested in water with DOC

CHRONIC INVERTEBRATE RESULTS :

Species	Test Type	NOEC / LOEC	End Point	Test Descriptor
Ceriodaphnia dubia	3 Brood	1.25 mg/l / 2.5 mg/l	Reproduction	Product

ADDITIONAL ECOLOGICAL DATA:
NOEC on earthworm: > 1000 mg/l (representative polymer) AOX information: Product contains no organic halogens.

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM , provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models. If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

OTHER INFORMATION
The hazard characterization is based on the tests or potential hazard in the clean water.

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, none of the substances in this product are hazardous.

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods.

1) As a flocculant employed prior to the sheet-forming operation in the manufacture of paper and paperboard and used at a level not to exceed 10 mg/L (10 ppm) of influent water. 2) As a pigment dispersant and/or retention aid prior to the sheet-forming operation at a level not to exceed 10 pounds of active polymer per ton of finished paper and paperboard with the level of residual monomer not to exceed 1 weight percent of the polymer (dry basis). 3) As a pigment dispersant in coatings at a level not to exceed 3.5 pounds of active polymer per ton of finished paper and paperboard.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

NSF INTERNATIONAL :
This product has received NSF/International certification under NSF/ANSI Standard 60 in the coagulation and flocculation category. The official name is "Poly (Diallyldimethylammonium Chloride) (pDADMAC)." Maximum product application dosage is : 57 mg/l.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
None of the substances are specifically listed in the regulation.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
Not considered a WHMIS controlled product.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

INTERNATIONAL CHEMICAL CONTROL LAWS

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

16. OTHER INFORMATION

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

PRODUCT

NALCO 8103 PLUS

EMERGENCY TELEPHONE NUMBER(S)
(800) 424-9300 (24 Hours) CHEMTREC

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight® CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight® (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight® CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS® CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/14/2005
Version Number : 4.5

BRENNTAG

BRENNTAG MID-SOUTH, INC.
MATERIAL SAFETY DATA SHEET
Effective Date: July 20, 2005

PHOSPHORIC ACID 75 - 80% BY WEIGHT

SECTION I - MATERIAL IDENTIFICATION

MANUFACTURER'S NAME & ADDRESS:
BRENNTAG MID-SOUTH, INC.
1405 Highway 136 West / Geneva Road
Henderson, Kentucky 42420

EMERGENCY TELEPHONE NUMBER:
(270) 830-1222

CHEMICAL NAME AND SYNONYMS: Phosphoric Acid, Orthophosphoric Acid, Monophosphoric Acid

CHEMICAL FAMILY: Phosphate

FORMULA: H_3PO_4

SECTION II - HAZARDOUS INGREDIENTS

CAS NUMBER	CHEMICAL NAME(S)	WT %	THRESHOLD LIMIT VALUES (UNITS) OSHA: PEL	OSHA: STEL	ACGIH: TLV	ACGIH: STEL
7732-18-5	Water	20 - 25	None established			
7664-38-2	**Phosphoric Acid	75 - 80	1 mg/m³	3 mg/m³	1 mg/m³	3 mg/m³

**This product contains chemical (s) subject to reporting requirements of Section 313, Title III of SARA, Part 372.

SECTION III - PHYSICAL DATA

BOILING POINT °F (°C): 275-316°F/135-158°C

SPECIFIC GRAVITY (H_2O=1): 1.57 to 1.69

VAPOR DENSITY (AIR =1): Not applicable

PERCENT VOLATILE BY VOLUME (%): Not applicable

VAPOR PRESSURE (mmHg): 2.2 to 5.6 @ 20 °C

EVAPORATION RATE: Not applicable

SOLUBILITY IN WATER: Complete

APPEARANCE AND ODOR: Clear, colorless liquid, no odor.

FREEZING POINT: Phosphoric Acid 75% 0.5°F (-17.5°C); Phosphoric Acid 85% 70°F (21.1°C)

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): N/A

FLAMMABLE LIMITS (% BY VOLUME): N/A

EXTINGUISHING MEDIA: This product does not support combustion.

SPECIAL FIRE FIGHTING PROCEDURES: Use full protective clothing and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Can produce explosive gas when in contact with metals. Keep containers cool with water spray to prevent rupture. Thermal decomposition emits toxic fumes of oxides of phosphorus.

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Effective Date: July 20, 2005

PHOSPHORIC ACID 75 - 80% BY WEIGHT

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

DANGER! Corrosive. Causes Severe irritation and burns to every area of contact. Harmful If swallowed or inhaled.

INHALATION: Vapors or mist cause irritation, including sneezing, burning taste, coughing, and difficulty breathing. Severe exposure can lead to a chemical pneumonitis.

EYE CONTACT: Corrosive. May cause redness, pain, blurred vision, eye burns, and permanent eye damage.

SKIN CONTACT: Corrosive. May cause redness, pain, and severe skin burns.

INGESTION: Corrosive. May cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach. Severe exposures can lead to shock, circulatory collapse, and death.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Persons with pre-existing skin disorders or eye problems, or impaired respiratory function may be more susceptible to the effects of the substance.

PRIMARY ROUTES OF ENTRY: Inhalation and skin contact.

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN: NTP/No IARC/No OSHA/No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Move immediately to fresh air. If not breathing, give artificial respiration. Obtain immediate medical attention.

EYE CONTACT: Flush immediately with plenty of cool water while holding eyelids open. Call a physician immediately.

SKIN CONTACT: Flush skin immediately with plenty of cool water and remove contaminated clothing. If irritation occurs or persists, get medical attention. Clean clothing before reuse.

INGESTION: Rinse mouth immediately, then drink 1 or 2 large glasses of milk or water. DO NOT INDUCE VOMITING. Get immediate medical attention.

SECTION VI - REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Stable under normal conditions. Flame temperatures.

INCOMPATIBILITY (MATERIALS TO AVOID): Can react violently with alkaline material, also can react with aluminum, copper, mild steel, brass and bronze. Do not mix with bleach or chlorinated detergents.

HAZARDOUS DECOMPOSITION PRODUCTS: At flame temperatures, will emit toxic phosphorus oxide fumes and hydrogen gass from reaction with metals.

BRENNTAG

BRENNTAG MID-SOUTH, INC.
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PHOSPHORIC ACID 75 - 80% BY WEIGHT

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Personnel with proper personal protective equipment should dike and contain large spills. Then pump to containers or soak up with inert absorbent. Salvage or neutralize with soda ash or lime. Adequate ventilation is required for ash due to the release of carbon dioxide gas.

WASTE DISPOSAL METHOD: Disposal is to be in accordance with Federal, State, and Local regulations. If material cannot be salvaged, neutralization followed by disposal into a treatment system in accordance with Federal, State, and Local regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Wear NIOSH approved respiratory protective equipment when vapor or mists may exceed applicable concentration limits.

VENTILATION: Local exhaust as required to control vapor concentration below permissible limits.

PROTECTIVE GLOVES: Rubber gloves. **EYE PROTECTION:** Splash-proof glasses with goggles or face shield.

OTHER PROTECTIVE EQUIPMENT: Clothing to prevent skin contact. Eye wash fountain and safety shower.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Avoid exposing to extreme heat or cold. Store in unopened container in cool, well ventilated area, away from potential sources of heat and fire. Keep away from combustible materials, strong bases and metals. Large storage tanks should be bermed and electrically grounded. Avoid using unprotected steel containers.

OTHER PRECAUTIONS: DANGER!! May cause severe burns to eyes and skin. Do not get in eyes, on skin or clothing. Wash thoroughly after handling. Avoid breathing mist or fumes. Use with adequate ventilation.

HAZARD RATING: Health 3 Flammability 0 Reactivity 0

SECTION X - D.O.T. SHIPPING INFORMATION

PROPER SHIPPING NAME: Phosphoric Acid Solution

HAZARD CLASS: 8 (Corrosive Material) **UN/NA:** UN 1805 **PACKING GROUP:** III

D.O.T. LABEL REQUIRED: Corrosive **REPORTABLE QUANTITY OF PRODUCT:** 5000 Pounds.

BRENNTAG

BRENNTAG MID-SOUTH, INC.
MATERIAL SAFETY DATA SHEET
Effective Date: July 20, 2005

PHOSPHORIC ACID 75 - 80% BY WEIGHT

SECTION XI – REGULATORY INFORMATION

TSCA (Toxic Substance Control Act): All components of this product are listed on the TSCA inventory.

SARA TITLE III: HAZARD CLASSIFICATIONS: Acute: yes Chronic: no Fire: no Pressure: no Reactivity: no

This product contains 75 to 85% phosphoric acid CAS #: 7664-38-2 which is subject to reporting requirements of Section 313, Title III of SARA, Part 372.

CANADA: This product is WHMIS controlled. Category D1a, E. This product does contain ingredients) out Ingredient Disclosure List. All intentional ingredients are listed on the Domestic Substance List.

WHILE BRENNTAG MID-SOUTH, INC. BELIEVES THAT THE INFORMATION CONTAINED HEREIN IS FACTUAL; IT IS NOT TO BE TAKEN AS A WARRANTY OR REPRESENTATION FOR WHICH BRENNTAG MID-SOUTH, INC. ASSUMES LEGAL RESPONSIBILITY. IT IS OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION AND VERIFICATION. ANY USE OF THIS INFORMATION AND DATA MUST BE DETERMINED BY THE USER TO BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

PREPARED BY

APPROVED BY

PC FILE C:\RD1\WORD\MSDS\PA80%

FORMAT REVISION DATE: April 23, 2001

Thermo
ELECTRON CORPORATION
166 Cummings Center
Beverly, MA 01915 USA
Telephone: 978-232-6000

Orion 080514
Polarographic D.O. Probe Electrolyte Solution
Material Safety Data Sheet

I. PRODUCT IDENTIFICATION: Polarographic D. O. Probe Electrolyte Solution

Orion 080514

PRODUCT USE: Reagent

NFPA RATINGS: HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0

II. COMPOSITION/INFORMATION ON INGREDIENTS

		%	LD_{50} mg/kg
COMPONENT	Potassium Chloride (KCl)		
CAS NO.	7447-40-7	4	3,600 (ORL-RAT)
COMPONENT	Deionized Water (H_2O)		
CAS NO.	7732-18-5	96	190,000 (IPR-MUS)

III. HAZARDS IDENTIFICATION

TARGET ORGANS: Skin and eyes.
ACUTE TOXICITY: Low hazard. An electrolyte imbalance might occur if swallowed.
CHRONIC TOXICITY: Low hazard.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Cause stinging in an open cut.

IV. FIRST AID MEASURES

EYE AND SKIN CONTACT: Irrigate with water.
INGESTION: Dilute with water and seek medical attention.
INHALATION: Not hazardous.

V. FIRE FIGHTING MEASURES

FLASH POINT: NA AUTOIGNITION POINT:NA
FLAMMABILITY LIMITS: UPPER: NA LOWER: NA
EXTINGUISHING MEDIA: Dry chemical, water spray, foam or CO_2.

VI. ACCIDENTAL RELEASE MEASURES

Clean up and set aside for waste disposal.

VII. HANDLING AND STORAGE

Always wear eye protection and gloves when working with this product.

Product is low hazard.
Keep at room temperature and well sealed.

VIII. EXPOSURE CONTROLS/ PERSONAL PROTECTION

OSHA & ACGIH THRESHOLD LIMIT: None listed.
PROTECTIVE EQUIPMENT: Safety glasses, lab coat and gloves.

IX. PHYSICAL AND CHEMICAL PROPERTIES

STATE: Clear liquid ODOR THRESHOLD: None
SENSITIVITY TO MECHANICAL IMPACT: None
SENSITIVITY TO STATIC DISCHARGE: None
COEFFICIENT OF OIL/WATER DISTRIBUTION: None
SOLUBILITY IN WATER: Soluble pH: 5.5 – 7.5
SPECIFIC GRAVITY: 1.08
BOILING POINT: 100°C MELTING POINT: Not determined
VAPOR DENSITY: Not determined

X. STABILITY AND REACTIVITY

Product is stable. Hazardous polymerization will not occur.
Incompatibles: None.
Hazardous decomposition product: None.

XI. TOXICOLOGICAL INFORMATION

Route of Exposure: Itching of skin, irritation of eyes if allowed to come in direct contact.,
Teratogen Status: None
Mutagen Status: None
Reproductive Toxicity: None
Carcinogen Status: None

XII. ECOLOGICAL INFORMATION

None available.

XIII. DISPOSAL CONSIDERATIONS

Dispose of in a manner consistent with Federal, State and Local Regulations.

XIV. TRANSPORT INFORMATION

Product is not hazardous for transport.

XV. REGULATORY INFORMATION

EUROPEAN INFORMATION:

None.

US/ CANADA INFORMATION

SARA/Title III: Ingredients not listed.
Cal. Proposition 65: Ingredients not listed.
US TSCA Inventory: Ingredients are listed.
CPR Class: None.
TDG Class: None.
MSDS discloses elements required by the CPR.

XVI. OTHER INFORMATION

THE ABOVE INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. ALL PRODUCTS ARE OFFERED IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT PRODUCTION SPECIFICATIONS AND ARE INTENDED SOLELY FOR USE IN ANALYTICAL TESTING. THE MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR ANY INJURY, LOSS OR DAMAGE RESULTING FROM THE HANDLING, USE OR MISUSE OF THESE PRODUCTS.

MSDS prepared by Quality Assurance Group.

Document Number 232337-001 Rev. E Effective Date: Feb. 24, 2005

MATERIAL SAFETY DATA SHEET

Sodium Carbonate, Anhydrous

FMC

MSDS Ref. No: 497-19-8
Version: US/Canada
Date Approved: 04/13/2001
Revision No: 3

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Carbonate, Anhydrous
SYNONYM(s): Soda Ash, Sodium Carbonate Anhydrous
GENERAL USE: Glass manufacture, detergent manufacture, sodium chemicals and carbonate chemicals manufacture, pulp and paper, brine treatment, water hardness removal, pH adjustment in water or waste water, flue gas desulfurization, coal treatment, ion exchange resin regeneration.

This chemical is certified to ANSI/NSF Standard 60, Drinking Water Chemicals-Health Effects. The maximum dosage level for this chemical is 150 mg/L.

MANUFACTURER

FMC Wyoming Corporation
Alkali Chemicals Division
1735 Market Street
Philadelphia, PA 19103
General Information: 215-299-6000

Emergency Telephone Numbers:

CHEMTREC (U.S.): (800) 424-9300
Emergency Phone (303)595-9048
(Medical - call collect)
Emergency Phone (307) 875-2580
(Green River, WY-call collect)

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%
Sodium carbonate	497-19-8	99.8

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: White, granular solid. Product is non-combustible. Reacts with acids to release carbon dioxide gas and heat. Irritating to the eyes. Continuous contact may irritate skin.

POTENTIAL HEALTH EFFECTS: Direct contact with the product causes irritation of the eyes and continuous contact may cause skin irritation (red, dry, cracked skin). Excessive

levels of airborne dust may irritate the mucous membranes and upper respiratory tract.

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: While internal toxicity is low, irritant effects of high concentrations may produce corneal opacities, and vesicular skin reactions in humans with abraded skin only. Treatment is symptomatic and supportive.

5. FIRE FIGHTING MEASURES

FLAMMABLE LIMITS: Not applicable

EXTINGUISHING MEDIA: Water, water fog, carbon dixoide (CO2), dry chemical

HAZARDOUS COMBUSTION PRODUCTS: Fumes of sodium oxide.

FIRE / EXPLOSION HAZARDS: Not applicable

FIRE FIGHTING PROCEDURES: Wear full protective clothing and self-contained breathing apparatus.

AUTOIGNITION TEMPERATURE: Not applicable

PROPERTIES CONTRIBUTING TO FLAMMABILITY: Not applicable

FLASH POINT: Non-combustible

SENSITIVITY TO STATIC DISCHARGE: None

SENSITIVITY TO IMPACT: None

HAZARDOUS DECOMPOSITION PRODUCTS: Heated to decomposition, it emits fumes of sodium oxide.

6. ACCIDENTAL RELEASE MEASURES

GENERAL PROCEDURES: Sweep up and recycle into process if contamination does not present a problem. Use appropriate protective equipment if dust is generated or contact with eyes or skin is expected. Flush residues and liquid to holding area for neutralization before discharge.

7. HANDLING AND STORAGE

HANDLING: Use air conveying/mechanical systems for bulk transfer to storage. For manual handling of bulk transfer use mechanical ventilation to remove airborne dust from railcar, ship or truck. Use approved respiratory protection when ventilation systems are not available. Selection of respirators is based on the dust cloud generated.

STORAGE: Store in a cool dry area, away from acids.

COMMENTS: Provide general mechanical and/or local exhaust ventilation to prevent release of airborne dust into the work environment. Approved respiratory protection should be used when airborne dust is expected to be released.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Minimize eye and skin contact by using appropriate protective equipement. Use local or general room ventilation to control airborne dust that may be generated into the work environment.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use cup type chemical goggles.

RESPIRATORY: Use approved dust respirator for low levels of airborne dust. High concentrations may require air supplied systems.

PROTECTIVE CLOTHING: Use impervious gloves to prevent skin contact, arm protectors and aprons. If clothing becomes contaminated, remove and launder before reuse. Industrial safety shoes.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Odorless

APPEARANCE: White, granular solid.

pH: (1% solution): 11.4

PERCENT VOLATILE: Not applicable

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not Applicable

BOILING POINT: Decomposes

FREEZING POINT: 851°C (1564°F)

SOLUBILITY IN WATER: 33.2 % maximum

EVAPORATION RATE: (Butyl Acetate - 1) Not applicable

DENSITY: (g/ml) Dense Grades = 0.86 - 1.12; Light Grades = 0.70 - 0.90

SPECIFIC GRAVITY: 2.509 (water = 1)

COEFF. OIL/WATER: Not applicable

ODOR THRESHOLD: Not applicable

OXIDIZING PROPERTIES: Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Contact with acids except under controlled conditions.

STABILITY: Stable

POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: None

INCOMPATIBLE MATERIALS: Reacts with acids with release of large volumes of carbon dioxide gas and heat.

COMMENTS: Materials to Avoid : Aluminum powder, acids, fluorine, molten lithium

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Severe irritant (rabbit) [Toxicology 23:281 (1982)]

SKIN EFFECTS: Non-irritating to intact skin. Minor irritation may occur on abraded skin.
[Toxicol. Appl. Pharmacol. 31:481 (1975)]

DERMAL LD_{50}: No data available for the product.

ORAL LD_{50}: 4090 mg/kg (rat) [RTECS 1986]

INHALATION LC_{50}: 2.3 mg/L (rat, 2 hr) [Environ, Res. 31:138 (1983)]

SENSITIZATION: Non-sensitizing (humans, 0.25% sodium carbonate) [Toxicol. Appl. Pharmacol. 31:481 (1975)]

TARGET ORGANS: Eyes

ACUTE EFFECTS FROM OVEREXPOSURE: May cause severe irritation of the eyes, including corneal opacities. Dusts and mists may be irritating to the skin, mucous membranes and upper respiratory tract.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product.

CARCINOGENICITY:

IARC: Not listed

NTP: Not listed

OSHA: Not listed

OTHER: (ACGIH) Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Daphnia Magna 96 hr LC50 = 265 - 565 mg/L
Bluegill Sunfish 96 hr LC50 = 300 - 320 mg/L

CHEMICAL FATE INFORMATION: Biodegradability does not apply to inorganic substances.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Salvage as much material as possible and return to process if contamination does not present a problem. Dispose in an accepted landfill in accordance with accepted governmental regulations.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME: Not regulated

PRIMARY HAZARD CLASS/DIVISION: Not applicable

UN/NA NUMBER: None

PLACARDS: Not applicable

LABEL: Not applicable

OTHER SHIPPING INFORMATION:
DOT Marking: Not applicable
Hazardous Substance/RQ: Not applicable
49 STCC Number: Not applicable

SPECIAL SHIPPING NOTES: IMDG: Not regulated
IATA: Not regulated

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): Not listed

SECTION 311 HAZARD CATEGORY (40 CFR 370):
Immediate (Acute) Health Hazard

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
10000 lbs.

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA REGULATORY (40 CFR 302.4): Not applicable

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS (40 CFR 710): Listed

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):
Product Identification Number: Not applicable
Hazard Classification: Toxic, Class D, Div. 2, Subdiv. B
Ingredient Disclosure List: Listed

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16. OTHER INFORMATION

REVISION SUMMARY Revision #: 3

This MSDS replaces the September 10, 1998 MSDS. Any changes in information are as follows:
In Section 9
(Group Field) for Density

In Section 16
Section 16 Footnotes

HMIS RATING

HEALTH:	2
FLAMMABILITY	0
REACTIVITY:	0
PROTECTION:	J

NFPA RATING

HEALTH:	2
FLAMMABILITY	0
REACTIVITY:	0
SPECIAL:	None

Key
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

HMIS RATINGS NOTES:
Protection – J (Safety goggles, gloves, apron & combination dust & vapor respirator)

The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard and Canada's Workplace Hazardous Information System (WHMIS).

National Fire Protection Association (NFPA)

Hazardous Materials Identification System (HMIS)

Material Safety Data Sheet

Sodium Metabisulfite

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Metabisulfite

OTHER/GENERIC NAMES: Anhydrous Sodium Bisulfite
Sodium Pyrosulfite
ABS

PRODUCT USE: Drug manufacture, food additive, water treatment, textile manufacture, photographic chemicals, and other chemical processes.

MANUFACTURER: Esseco General Chemical
90 East Halsey Road
Parsippany, NJ 07054
USA

FOR MORE INFORMATION CALL: 973-515-1840
(Monday-Friday, 9:00am-4:30pm)

IN CASE OF EMERGENCY CALL: 800-631-8050 or
(24 Hours/Day, 7 Days/Week) 973-515-0900
(Outside of USA)

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Sodium metabisulfite	7681-57-4	>98
Sodium sulfite	7757-83-7	<1.5

Trace impurities and additional material names not listed above may appear in Section 15 of this MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

OSHA Hazard Communication Standard: *This product is considered hazardous under the OSHA Hazard Communication Standard.*

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Fine, white granular product with a pungent sulfur dioxide gas odor. May irritate the skin. May cause irritation and/or burns to the eyes. Harmful if swallowed or inhaled. May cause severe and possibly fatal allergic reactions if inhaled or swallowed by some asthmatics and other 'sulfite-sensitive' individuals. Reacts with acids to form toxic and irritating sulfur dioxide gas. Releases sulfur dioxide if heated above 300°F.

POTENTIAL HEALTH HAZARDS

SKIN: Repeated or prolonged contact with dust may cause irritation. Contact with solutions will cause skin irritation.

EYES: Dust or mist may irritate or burn the eyes. Solutions will irritate or burn.

INHALATION: Contact with acids, water and/or ice, releases sulfur dioxide gas which may be harmful or deadly if inhaled. May cause severe or deadly allergic reactions in some asthmatics and sulfite sensitive individuals. Inhalation of dust or mist can irritate the respiratory tract. Possible signs and symptoms of allergic reactions include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure and anaphylaxis.

INGESTION: May irritate the gastrointestinal tract. May cause severe or deadly allergic reactions in some asthmatics and sulfite sensitive individuals. Very large doses may cause violent colic, diarrhea, depression, and even death.

DELAYED EFFECTS: None known.

Ingredients found on one of the three OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section.			

4. FIRST AID MEASURES

SKIN: Immediately wash skin with plenty of soap and water. Remove contaminated clothing and wash before reuse. Get medical attention if irritation persists.

EYES: Flush eyes immediately with water for at least 15 minutes. Get medical attention.

INHALATION: Promptly remove to fresh air. Get immediate medical attention if signs of suffocation, irritation or other symptoms develop.

INGESTION: If conscious, immediately give a large quantity of water or milk and induce vomiting by touching finger to back of throat. Get immediate medical attention. Never give anything by mouth to an unconscious person.

ADVICE TO PHYSICIAN: Treat symptomatically. Note potential for anaphylactic shock with allergic individuals.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:
Material is not flammable. Use extinguishing media appropriate for material in surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Releases toxic and irritating sulfur dioxide at fire temperatures.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:
Wear NIOSH-approved self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (See section 8 for recommended personal protective equipment.)
Promptly sweep up material with minimum dusting and shovel into an empty container with a cover. Cautiously spray residue with plenty of water. Provide ventilation to clear sulfur dioxide fumes which may be generated by contact with water.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (See section 8 for recommended personal protective equipment.)
Avoid contact with skin, eyes and clothing. Do not breathe dust. Do not eat or drink in the work area. Use normal personal hygiene and housekeeping. Keep away from water, ice, acids, heat and oxidizing agents. For Food Grade product, see precautions in section 16 regarding on-board use in preserving shrimp and fish.

STORAGE RECOMMENDATIONS:
Store in a cool, dry, well-ventilated area away from water, ice, acids and oxidizing agents. Releases sulfur dioxide gas slowly at ambient temperatures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Local exhaust if dusty conditions exist or if there is a release of sulfur dioxide gas. Do not use in unventilated spaces, e.g., the holds of fishing boats, walk-in coolers or confined spaces.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:	For handling dry material, wear cotton gloves and full work clothing, including long-sleeved shirt and trousers. When handling solutions and there is prolonged or repeated contact, wear impervious gloves, clothing and boots.
EYE PROTECTION:	Wear a hard hat (or other head covering) and chemical safety goggles. Do not wear contact lenses.
RESPIRATORY PROTECTION:	Where required, use a NIOSH-approved respirator for dust, mist and/or sulfur dioxide gas, as conditions indicate. Some exposures may require a NIOSH-approved self-contained breathing apparatus or supplied-air respirator.
ADDITIONAL RECOMMENDATIONS:	Eyewash and safety shower is recommended.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Sodium metabisulfite	5 mg/m^3 TWA	—	—

[1] = Limit established by General Chemical Corporation.
[2] = Workplace Environmental Exposure Level (AIHA).
[3] = Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:
Sulfur dioxide: OSHA TWA = 5 ppm
ACGIH TLV = 2 ppm
ACGIH STEL = 5 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Fine, white granular material.
PHYSICAL STATE: Solid.
MOLECULAR WEIGHT: 190.11
CHEMICAL FORMULA: $Na_2S_2O_5$
ODOR: Pungent sulfur dioxide odor.
SPECIFIC GRAVITY (water = 1.0): 1.48
SOLUBILITY IN WATER (weight %): 39% at 16C
pH: 1% solution – 4.3
BOILING POINT: Not applicable.
MELTING POINT: Begins to rapidly decompose above 150C
VAPOR PRESSURE: Not applicable.
VAPOR DENSITY (air = 1.0): Not applicable.
EVAPORATION RATE: Not applicable. **COMPARED TO:** Not applicable
% VOLATILES: Not applicable.
FLASH POINT: Not flammable.
(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):
Normally stable. Avoid elevated temperatures. Temperatures above 150C cause the rapid evolution of toxic and corrosive sulfur dioxide gas.

INCOMPATIBILITIES:
Oxidizers: may cause strong exothermic reactions.
Acids, water and ice: releases sulfur dioxide gas which is toxic, corrosive, and potentially deadly. Water and/or ice speeds the production of sulfur dioxide gas.

HAZARDOUS DECOMPOSITION PRODUCTS:
Sulfur dioxide and sodium sulfide residue. Sodium sulfide is flammable, a dangerous fire risk, a strong irritant to skin and tissue, and is incompatible with acids.

HAZARDOUS POLYMERIZATION:
Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:
Sodium metabisulfite – LD_{50} (oral, rat) = 424 mg/kg
Sodium bisulfite – LD_{50} (oral, mouse) = 820 mg/kg

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:
Sodium sulfite has been demonstrated to be mutagenic in microbial systems; however, it is not mutagenic in studies involving insects and is not considered to present a mutagenic threat to multi-cell organisms.

OTHER DATA:
None

12. ECOLOGICAL INFORMATION

For Sodium sulfite:
2600 ppm/24, 48 & 96 hr/mosquito fish/TL_m/fresh water
Biological Oxygen Demand (BOD): 0.12 lb/lb, instantaneous

13. DISPOSAL CONSIDERATIONS

RCRA
Is the unused product a RCRA hazardous waste if discarded? No.
If yes, the RCRA ID number is: Not applicable.

OTHER DISPOSAL CONSIDERATIONS:
Dispose of in accordance with applicable Federal, State and Local regulations.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not regulated.
US DOT ID NUMBER: Not applicable.
PROPER SHIPPING NAME: Not applicable.
For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: All components are listed on TSCA Inventory of Chemical Substances.

OTHER TSCA ISSUES: None.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
No ingredients listed in this section.		

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate.

SARA 313 TOXIC CHEMICALS:
The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirements. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
No ingredients listed in this section.	

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section.		

ADDITIONAL REGULATORY INFORMATION:
None

WHMIS CLASSIFICATION (CANADA):
D2B

FOREIGN CHEMICAL CONTROL INVENTORY STATUS:
Listed on Canadian DSL and EU EINECS.

16. OTHER INFORMATION

CURRENT ISSUE DATE: April, 2003
PREVIOUS ISSUE DATE: January, 2002

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:
Change in company name.

OTHER INFORMATION: Only NF grade is for use in drug formulation. Only Food Grade material is for use as a food additive.

On-board ship use of Food Grade material to preserve shrimp and fish:
NEVER apply dry material to shrimp or fish. ALWAYS prepare and use a solution in a well-ventilated area.
NEVER use below deck or in any confined space such as a hold or cooler. Injury or death may occur.
ALWAYS use on deck with plenty of ventilation.
Follow mixing and use directions printed on bag.

ASTARIS *Material Safety Data Sheet*

Responsible Care® A Public Commitment

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: SODIUM TRIPOLYPHOSPHATE ANHYDROUS

Reference Number: AST10056 Date: July 10, 2000

Chemical Family: Phosphate Salts

Chemical Name: Triphosphoric Acid, Pentasodium Salt

Synonyms: STP; STPP; Polysorb®

Company Information:

ASTARIS LLC
622 Emerson Road - Suite 500
St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1-800-424-9300
In Canada call CANUTEC: 1-613-996-6666

General Information: 1-800-244-6169

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No.
Sodium Tripolyphosphate Anhydrous	7758-29-4
Tetrasodium Pyrophosphate (TSPP)	7722-88-5
Sodium Trimetaphosphate	7785-84-4

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: White powder or granules with no odor

WARNING STATEMENTS

CAUTION!

MAY CAUSE RESPIRATORY TRACT IRRITATION

POTENTIAL HEALTH EFFECTS

Likely Routes of Exposure: Skin contact and inhalation

EYE CONTACT: No more than slightly irritating based on toxicity studies. The dry powder may cause foreign body irritation in some individuals.

SKIN CONTACT: No more than slightly toxic or slightly irritating based on toxicity studies. Prolonged contact with the dry powder may cause drying or chapping of the skin.

INHALATION: This product may cause coughing, chest tightness, runny nose, chest pain, and burning throat.

INGESTION: No more than slightly toxic if swallowed based on toxicity tests. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Swallowing large quantities may cause gastrointestinal tract irritation, nausea, vomiting, and diarrhea.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES OR ON SKIN, immediate first aid is not likely to be required. However, this material can be removed with water. Remove material from eyes, skin and clothing. Wash heavily contaminated clothing before reuse.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice.

5. FIRE FIGHTING MEASURES

FLASH POINT: Not combustible

HAZARDOUS PRODUCTS OF COMBUSTION: Not applicable

EXTINGUISHING MEDIA: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known

6. ACCIDENTAL RELEASE MEASURES

In case of spill, sweep, scoop or vacuum and remove. If possible, complete cleanup on a dry basis. Flush residual spill area with water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

HANDLING

Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.

Emptied container retains product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

STORAGE: Store in a cool, dry place to maintain product performance.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION: This product does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

SKIN PROTECTION: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: Avoid breathing dust. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 C.F.R. 1910 134.

VENTILATION: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

AIRBORNE EXPOSURE LIMITS: OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts.

OSHA PEL	ACGIH TLV
15 mg/m3 (total dust) 8-hr TWA	10 mg/m3 (inhalable) 8-hr TWA
5 mg/m3 (respirable) 8-hr TWA	3 mg/m3 (respirable) 8-hr TWA

Sodium tripolyphosphate anhydrous contains tetrasodium pyrophosphate which has the following airborne exposure guidelines:

OSHA PEL	ACGIH TLV
5 mg/m3 8-hr. TWA	5 mg/m3 8-hr. TWA

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Formula:	$Na_5P_3O_{10}$
Appearance:	White powder or granules

Odor:	None
pH:	9.7-10.1 (as a 1% solution @ 25 C)
Melting Point @ 760 mm Hg:	Begins to melt incongruently @ 552 degrees C; completely melted @ 622 degrees C
Bulk Density (lb./cu. ft):	Powder - 50-65; Granular - 43-52 (medium dense)
Solubility in Water (g/100 g H2O):	6.0 @ 0 degrees C, 14.8 @ 25 degrees C, 16.7 @ 60 degrees C, 22.2 @ 80 degrees C, 32.2 @ 100 degrees C

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling

MATERIALS TO AVOID: None known

HAZARDOUS DECOMPOSITION PRODUCTS: None known

HAZARDOUS POLYMERIZATION: Will not occur

11. TOXICOLOGICAL INFORMATION

Data from Astaris single-dose (acute) animal studies with this material are given below:

Oral - rat LD50 - 5,400 mg/kg; practically non-toxic
Dermal - rabbit LD50 - > 7,940 mg/kg; practically non-toxic
Eye Irritation - rabbit - 3.3/110.0; slightly irritating
Skin Irritation - rabbit - 0-0/8.0 (24-hr exp.); not irritating
Inhalation - LC50 > 0.39 mg/L (rat, 4 hr) (maximum attainable concentration)

Rats fed Sodium Tripolyphosphate Anhydrous in their diet for two years exhibited decreased growth, increased kidney/body weight ratios, and kidney changes. No birth defects were noted in rabbits given Sodium Tripolyphosphate Anhydrous orally during pregnancy. No effects were seen on the ability of male and female rats to reproduce when fed Sodium Tripolyphosphate Anhydrous for 3 successive generations. Sodium Tripolyphosphate Anhydrous has generally produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells. Genetic changes were reported in a standard test using yeast cells.

The following component has been defined as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Tetrasodium pyrophosphate (a component of sodium tripolyphosphate anhydrous)

The dry powder may cause foreign body irritation in some individuals. Excessive inhalation of dust may be annoying and can mechanically impede respiration. The high alkalinity of tetrasodium pyrophosphate (TSPP) may cause upper respiratory tract irritation. Prolonged

contact with the dry powder may cause drying or chapping of the skin.

Acute studies indicate that this material is slightly toxic orally (rat) and practically nontoxic after skin application (rabbit). It is slightly irritating to rabbit eyes and nonirritating to rabbit skin. Rats fed tetrasodium pyrophosphate in their diet for four months showed a reduced weight gain, urinary changes, increased organ-to-body weight ratios, and slight kidney damage. No birth defects were reported in rabbits, hamsters, mice or rats given this material orally during pregnancy.

Tetrasodium pyrophosphate produced no genetic changes in standard tests using bacterial and yeast cells.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

Invertebrate: 48-hr EC50 Daphnia magna: > 1000 mg/L; Practically Nontoxic

96 hr. LC 50 > 100 mg/L, non-toxic (Rainbow trout, inland silversides and mysid schrimp). [FMC I89-1081, 1082 & 1083]

48 hr. EC 50> 100 mg/L, non-toxic (Daphnia magna) [FMC I89-1084]

Astaris has not conducted biodegradation studies with this product since when dissolved/hydrolyzed in water it yields completely mineralized materials.

13. DISPOSAL CONSIDERATIONS

This material when discarded is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be landfilled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

US DOT

Not regulated for transportation

Canadian TDG

Not regulated for transportation

15. REGULATORY INFORMATION

TSCA Inventory: Listed

DSL Inventory: Listed

WHMIS Classification: D2(B) - Materials Causing Other toxic Effects

SARA Hazard Notification
Hazard Categories Under Title III Rules (40 CFR 370): Immediate
Section 302 Extremely Hazardous Substances: Not Applicable
Section 313 Toxic Chemical(s): Not Applicable

CERCLA Reportable Quantity: Not applicable

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	1	0	0	
Suggested HMIS Rating	1	0	0	F

Reason for revision: New Company Supersedes MSDS dated: Not Applicable

Product Use: Food Ingredient, Cleaning Compound

Astaris™ is a trademark of Astaris LLC
Responsible Care® is a registered trademark of the Chemical Manufacturers Association

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Astaris LLC makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Astaris LLC be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS

CoS Jim Walters 57-13-6

ASHLAND
SAFETY DATA SHEET

Revision Date: 02/19/2007
Print Date: 2/22/2007
MSDS Number: R0000007
Version: 1.1

UREA PRILL XTL IND 104703

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Ashland
P.O. Box 2219
Columbus, OH 43216

Regulatory Information Number	1-800-325-3751
Telephone	614-790-3333
Emergency telephone number	1-800-ASHLAND (1-800-274-5263)

Product name	UREA PRILL XTL IND
Product code	104703
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: solid, Almost odorless, White

WARNING! Moderate skin irritant, Moderate eye irritant.

Potential Health Effects

Routes of exposure
Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact
Dust can cause severe eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure eye tissue.

Skin contact
May cause mild skin irritation. Symptoms may include redness and burning of skin. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation
Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, lung (for example, asthma-like conditions)

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), headache, dizziness

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, emphysema

Carcinogenicity

Based on the available information, this material cannot be classified with regard to carcinogenicity., This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive hazard.

Based on the available information, risk to the fetus from maternal exposure to this material cannot be assessed.

Other information

No data

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration
AMIDE	NJTS# 254504001-5518	<=100%

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention.. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician

Hazards: No information available.
Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

foam, water spray, carbon dioxide (CO2), dry chemical

Hazardous combustion products

May form:, acid vapors, ammonia, carbon dioxide and carbon monoxide, nitrogen compounds

Precautions for fire-fighting

No special fire hazards are known to be associated with this product.Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

No data

Environmental precautions

No data

Methods for cleaning up

Shovel material into containers. Thoroughly sweep area of spill to clean up any residual material.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage

No data

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

Eye protection

Wear safety glasses in compliance with OSHA regulations. (Consult your safety representative.)

Skin and body protection

Wear normal work clothing covering arms and legs.Wear resistant gloves such as: Neoprene

Respiratory protection

If needed, use a NIOSH-approved dust respirator. (Ask your safety representative.)

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	solid
Form	Crystals or powder,
Colour	White
Odour	Almost odorless
Boiling point/range	No data
Melting point/range	270.86 °F / 132.70 °C
pH	7.2
Flash point	No data
Evaporation rate	No data
Explosion limits	No data
Vapour pressure	0.000002 kPa @ 77 °F / 25 °C
Vapour density	No data
Density	1.335 g/cm3 @ 77.00 °F / 25.00 °C
	No data
Solubility	No data
Partition coefficient (n-octanol/water)	No data
Autoignition temperature	No data

10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

None known.

Incompatible products

Avoid contact with:, acids, nitrates, strong bases, strong oxidizing agents

Hazardous decomposition products

May form:, acid vapors, ammonia, carbon dioxide and carbon monoxide, nitrogen compounds

Hazardous reactions

Product will not undergo hazardous polymerization., Reacts with sodium or calcium hypochlorite to form explosive nitrogen trichloride.

Thermal decomposition

No data

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity

AMIDE — LD 50 Rat: 8,471 mg/kg

Acute inhalation toxicity

Acute dermal toxicity

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Acute and Prolonged Toxicity to Fish
No data

Acute Toxicity to Aquatic Invertebrates
No data

Environmental fate and pathways
No data

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution Company, IC&S Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION

Dangerous goods descriptions may not reflect package size, quantity, end-use or region-specific exceptions that can be applied to shipments. Consult shipping documents for material-specific descriptions.

15. REGULATORY INFORMATION

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm..

Additional regulations
US. High Production Volume Chemicals

SARA 313 Component(s)

OSHA Hazards Moderate skin irritant
Moderate eye irritant

	Health	Flammability	Reactivity	Other
HMIS	2	1	0	
NFPA				No data

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751)

ATTACHMENT I

EMISSION UNITS TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
7-17A	7-17B	2-Vacuum Pumps	1974,1980	3,675 lb/hr each	Modification*	CO-320001
CO-320001	7-17B	Catalytic Oxidizer	1995	3.0 MMBTU Burner	Modification	NA
10	10	Pug Mill/51 Mill Process	1995	4,410 lb/hr each	Modification	PV-780303 & DC-780401
~~8~~	~~8~~	~~3x3 Rotary Drum Filter~~	~~1998~~	~~280 CFM~~	~~Remove~~	~~None~~
9C	9C	Pug Mill Feed Hopper	1995	4,410 lb/hr	Modification*	Baghouse DC-780201
7B	7B	Straight Line Filter and Parkson A Vapor Hood	1974	3,675 lb/hr	Modification*	None
9A	9A	Clay Storage Silos A-F(6)	1974	154 tons each	Modification*	Baghouse DC-701300
9B	9B	Day Bin	1974	20 tons	Modification*	Baghouse DC-720100
13	13	Haver A Packer	1974	3,675 lbs/hr	Modification*	Baghouse DC-770025
009	009	Haver C Packer	1974	4,410 lbs/hr	Modification*	Baghouse DC-790001
2A	2A	Dispersion Batch Tanks (2)	1974	Clay Slurry 84,000 lb/hr	Modification*	None
2	2	Rx and Disp. Tanks (6)	1974	Clay Slurry 84,000 lb/hr	Modification*	None
3	3	Flash Dryer System	1994	3,675 lb/hr	Modification*	Baghouse DC-751500
5	5	ACM #2 Mill	1991	3,675 lb/hr	Modification*	Baghouse DC-750030
16	16	ACM #1 Mill	1980	3,675 lb/hr	Modification*	Baghouse DC-750029

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

*Not a physical change. Change in the operating schedule.
Does not have a physical vent outside the building

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
17B	17B	EIMCO B Filter and Parkson B Vapor Hood	1980	3,675 lb/hr	Modification*	None
18	18	Boiler 1 (Kewanee Boiler)	2010	20.085 MMBtu/hr	Modification*	None
19	19	Hot Water Heater	1984	400,000 Btu/hr	Modification*	None
007	007	West Vacuum Filter Vent	1987	2,205 lb/hr	Modification*	None
008	008	East Vacuum Filter Vent	1987	2,205 lb/hr	Modification*	None
017	017	West 1st Stage FBD	1987	2,205 lb/hr	Modification*	Baghouse DF-760017
018	018	West 2nd Stage FBD	1987	2,205 lb/hr	Modification*	Baghouse DF-760018
019	019	East 1st Stage FBD	1987	2,205 lb/hr	Modification*	Baghouse DF-760019
020	020	East 2nd Stage FBD	1987	2,205 lb/hr	Modification*	Baghouse DF-760020
28	7-17B/28	D Tank	1974	9,988 gallons	Modification*	7-17B (Working) 28 (Breathing)
29	7-17B/29	C Tank	1984	11,374 gallons	Modification*	7-17B (Working) 29 (Breathing)
30	7-17B/30	B Tank	1984	11,374 gallons	Modification*	7-17B (Working) 30 (Breathing)
32	7-17B/32	S3 Tank	1980	9,988 gallons	Modification*	7-17B (Working) 32 (Breathing)
33	7-17B/33	S1 Tank	1980	20,305 gallons	Modification*	7-17B (Working) 33 (Breathing)
34	7-17B/34	S2 Tank	1980	20,305 gallons	Modification*	7-17B (Working) 34 (Breathing)
36	36	Central Vacuum System	1980	NA	NA	NA
40	40	Bulk Sack Packer	2013	3,000 pph	Modification*	DC-770135

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.
[4] For Control

*Not a physical change.
Does not have a physical vent outside the building

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
41	41	ACM #1 Feed Bin	1995	3,675 pph	Modification	HP-752500
42	42	ACM #2 Feed Bin	1995	3,675 pph	Modification	HP-753400
43	43	51 Mill Recycle Bin	1995	4,000 pph	Modification	HP-780304
44	44	Haver A Packing Hopper	1992	3,675 pph	Modification	DC-770021
45	45	"A" Bag Dump Station	1992	3,675 pph	Modification	DC-770001
46	46	"C" Bag Dump Station	1995	4,000 pph	Modification	DC-780100
47	47	Haver C Packing Hopper	1995	4,410 pph	Modification	DC-790000
17C	17C	Eimco C Filter Vapor Hood	1998	4,410 pph	Modification	None
48	48	CO_2 Transfer System	1995	2,628 tpy	No Change	None
20	20	Anion Addition	2007-2008	4,000 pph	Modification	TK-750310
49	49	Long Conveyor	1995	3,675 pph	Modification	DC-752010
50	50	Parkson C Vapor Hood	1998	4,410 pph	Modification	None
WWTP	WWTP	Wastewater Treatment Plant	2003	400 gpm	New	NA

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

*Not a physical change.

[4] Does not have a physical vent outside the building

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

Attachme
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
7-17B	Upward Vertical Stack	7-17A 28 29 30 32 33 34	Vacuum Pumps D Tank C Tank B Tank S3 Tank S1 Tank S2 Tank	7-17B	Catalytic Oxidizer	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC Methyl Chloride Hydrogen Chloride	0.02 0.25 0.29 0.01 170.60 1.30 ---	1.97 1.10 1.31 0.04 310.38 2.85 ---	0.02 0.25 0.29 0.01 8.55 0.06 0.65	0.09 1.10 1.27 0.04 15.61 0.14 1.42	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	MB	NA
10	Upward Vertical Stack	10	Pug Mill/ 51 Mill	10	Baghouse	C	8,760	PM/PM10/PM2.5	1.46	6.39	0.138	0.0606	Solid	EE	NA
3	Upward Vertical Stack	3	Flash Dryer	NA	NA	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	3,675 0.82 0.98 0.01 3.01	16,097 3.59 4.29 0.04 13.18	0.44 0.82 0.98 0.01 3.06	1.93 3.59 4.29 0.04 13.40	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	MB	NA
18	Upward Vertical Stack	18	Boiler	NA	NA	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	0.15 1.65 1.97 0.01 0.11	0.66 7.23 8.63 0.04 0.48	0.15 1.65 1.97 0.01 0.11	0.66 7.23 8.63 0.04 0.48	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA
19	Upward Vertical Stack	19	Gas Fired Heater	NA	NA	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	0.01 0.04 0.04 0.01 0.01	0.04 0.18 0.18 0.04 0.04	0.01 0.04 0.04 0.01 0.01	0.04 0.18 0.18 0.04 0.04	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA
017	Upward Vertical Stack	017	West 1st Stage FBD	DF-760017	Baghouse	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	2,205 0.43 0.51 0.01 0.81	9,658 1.88 2.23 0.04 3.55	0.13 0.43 0.51 0.01 0.81	0.57 1.88 2.23 0.04 3.55	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA

Table 1: ...issions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[3] (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
018	Upward Vertical Stack	018	West 2nd Stage FBD	DF-760018	Baghouse	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	2,205 0.43 0.51 0.01 0.81	9,658 1.88 2.23 0.04 3.55	0.13 0.43 0.51 0.01 0.81	0.57 1.88 2.23 0.04 3.55	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA
019	Upward Vertical Stack	019	East 1st Stage FBD	DF-760019	Baghouse	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	2,205 0.43 0.51 0.01 0.81	9,658 1.88 2.23 0.04 3.55	0.13 0.43 0.51 0.01 0.81	0.57 1.88 2.23 0.04 3.55	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA
020	Upward Vertical Stack	020	East 2nd Stage FBD	DF-760020	Baghouse	C	8,760	PM/PM10/PM2.5 CO NOx SO2 VOC	2,205 0.43 0.51 0.01 0.81	9,658 1.88 2.23 0.04 3.55	0.13 0.43 0.51 0.01 0.81	0.57 1.88 2.23 0.04 3.55	Solid Gas/Vapor Gas/Vapor Gas/Vapor Gas/Vapor	EE	NA
28	Conservation Vent	28	D Tank	NA	NA	C	8,760	VOC	0.01	0.05	0.01	0.05	Gas/Vapor	EE	NA
29	Conservation Vent	29	C Tank	NA	NA	C	8,760	VOC	0.01	0.06	0.01	0.06	Gas/Vapor	EE	NA
30	Conservation Vent	30	B Tank	NA	NA	C	8,760	VOC	0.01	0.06	0.01	0.06	Gas/Vapor	EE	NA

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[3] (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
32	Conservation Vent	32	S3 Tank	NA	NA	C	8,760	VOC	0.01	0.05	0.01	0.05	Gas/Vapor	EE	NA
33	Conservation Vent	33	S1 Tank	NA	NA	C	8,760	VOC	0.02	0.09	0.02	0.09	Gas/Vapor	EE	NA
34	Conservation Vent	34	S1 Tank	NA	NA	C	8,760	VOC	0.02	0.09	0.02	0.09	Gas/Vapor	EE	NA
9C	Upward Vertical Stack	9C	Pug Mill Feed Hopper	DC-780201	Baghouse	C	8,760	PM/PM10/PM2.5	6.92	30.33	0.0069	0.0303	Solid	EE	NA
7B	Upward Vertical Stack	7B	Straight Line Filter Hood Vent	NA	NA	C	8,760	PM/PM10/PM2.5	0.18	0.77	0.18	0.77	Solid	EE	NA
9A	Upward Vertical Stack	9A	Silos	DC-701300	Baghouse	C	800	PM/PM10/PM2.5	78.50	31.57	0.0785	0.0316	Solid	EE	NA

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[3] (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
9B	Upward Vertical Stack	9B	Day Bin Vent	DC-720100	Baghouse	C	800	PM/PM10/PM2.5	78.50	31.57	0.0785	0.0316	Solid	EE	NA
13	Upward Vertical Stack	13	Haver A Packer	DC-770025	Baghouse	C	8,760	PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA
009	Upward Vertical Stack	009	Haver C Packer	DC-760091	Baghouse	C	8,760	PM/PM10/PM2.5	6.92	30.33	0.0069	0.0303	Solid	EE	NA
2	Upward Vertical Stack	2	Process Tanks	NA	NA	C	8,760	PM/PM10/PM2.5 Methyl Chloride Benzyl Chloride	0.08 0.06 0.05	0.35 0.13 0.22	0.08 0.03 0.05	0.35 0.13 0.22	Solid Solid Solid	EE	NA
2A	Upward Vertical Stack	2A	Dispersion Tanks	NA	NA	C	8,760	PM/PM10/PM2.5	0.08	0.35	0.08	0.35	Solid	EE	NA
5	Upward Vertical Stack	5	ACM #2	DC-750030	Baghouse	C	8,760	PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA

Table 1. ...issions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
16	Upward Vertical Stack	16	ACM #1	DC-750029	Baghouse	C	8,760	PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA
17B	Upward Vertical Stack	17B	Eimco Filter Hood	NA	NA	C	8,760	PM/PM10/PM2.5	0.18	0.77	0.18	0.77	Solid	EE	NA
17C	Upward Vertical Stack	17C	Eimco Filter Hood	NA	NA	C	8,760	PM/PM10/PM2.5	0.21	0.93	0.21	0.93	Solid	EE	NA
50	Upward Vertical Stack	50	Parkson C	NA	NA	C	8,760	PM/PM10/PM2.5	0.21	0.93	0.21	0.93	Solid	EE	NA
007	Upward Vertical Stack	007	West Vacuum Filter Vent	NA	NA	C	8,760	PM/PM10/PM2.5 VOC	0.10 0.78	0.45 3.41	0.10 0.78	0.45 3.41	Solid Gas/Vapor	EE	NA
008	Upward Vertical Stack	008	East Vacuum	NA	NA	C	8,760	PM/PM10/PM2.5 VOC	0.10 0.78	0.45 3.41	0.10 0.78	0.45 3.41	Solid Gas/Vapor	EE	NA

Table 1: .iissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
40	Upward Vertical Stack	40	Bulk Sack Packer	DC-770135	BH	C	8,760	PM/PM10/PM2.5	4.71	20.63	0.0047	0.0206	Solid	EE	NA
41	Upward Vertical Stack	41	AC1 Bin	DC-752500	BH	C		PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA
42	Upward Vertical Stack	42	AC2 Bin	DC-753400	BH	C		PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA
43	Upward Vertical Stack	43	51 Recycle Bin	HP-780304	BH	C		PM/PM10/PM2.5	6.92	7.58	0.0069	0.0076	Solid	EE	NA
44	Upward Vertical Stack	44	Haver A Hopper	DC-770021	BH	C		PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA
45	Upward Vertical Stack	45	Dump Station A	DC-770001	BH	C		PM/PM10/PM2.5	5.77	6.32	0.0058	0.0063	Solid	EE	NA

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type[1]	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[3] (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
46	Upward Vertical Stack	46	Dump Station C	NEEDED	BH	C		PM/PM10/PM2.5	6.28	6.88	0.0063	0.0069	Solid	EE	NA
47	Upward Vertical Stack	47	51 Mill Hopper	PV-780303	BH	C		PM/PM10/PM2.5	6.92	30.33	0.0069	0.0303	Solid	EE	NA
48	Upward Vertical Stack	48	CO_2 Transfer System	NA	NA	NA		CO_2	NA	NA	NA	2,384	Vapor	EE	NA
49	Upward Vertical Stack	49	Long Conveyor Torrit	DC-752010	BH	C		PM/PM10/PM2.5	5.77	25.27	0.0058	0.0253	Solid	EE	NA

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
7-17B	2.125	609	10,143	48	~600	~55	4,245.7	442.2
10	1.25	100	4,500	54	~600	~80	4,245.7	442.2
3	3.33	230	25,000	57.4	~600	~104	4,245.7	442.2
18	3.08	300	2,500	5.6	~600	~64	4,245.7	442.2
19	0.67	300	137	6.5	~600	~18	4,245.7	442.2
017	2.5	150	18,000	61	~600	~38	4,245.7	442.2
018	2.5	150	18,000	61	~600	~38	4,245.7	442.2
019	2.5	150	18,000	61	~600	~38	4,245.7	442.2
020	2.5	150	18,000	61	~600	~38	4,245.7	442.2
28	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2
29	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2
30	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2
32	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2
33	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2
34	0.25	100	13.4	4.5	~600	~49	4,245.7	442.2

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
9C	0.25	70	1,160	4.5	~600	10	4,245.7	442.2
2A	0.83	110	1,160	4.5	~600	46	4,245.7	442.2
2	2.0	110	4,000	21.2	~600	49	4,245.7	442.2
5	1.25	150	4,500	61.1	~600	85	4,245.7	442.2
7B	1.5	75	3,270	30.8	~600	75	4,245.7	442.2
9A	0.4	70	1,160	66.3	~600	1.25	4,245.7	442.2
9B	1.0	70	1,160	24.6	~600	64	4,245.7	442.2
13	1.25	Ambient	4,000	54.3	~600	85	4,245.7	442.2
16	1.17	100	4,500	69.8	~600	70	4,245.7	442.2
17B	1.67	75	3,270	24.9	~600	75	4,245.7	442.2
17C	1.67	75	3,270	24.9	~600	75	4,245.7	442.2
007	0.5	90	1,200	102	~600	39	4,245.7	442.2
008	0.5	90	1,200	102	~600	39	4,245.7	442.2
009	1.25	Ambient	900	54.3	~600	85	4,245.7	442.2
50	1.67	75	3,270	24.9	~600	75	4,245.7	442.2
40	NA	Ambient	350	NA	~600	~15	4,245.7	442.2
41	NA	100	650	NA	~600	NA	4,245.7	442.2

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
42	NA	100	650	NA	~600	NA	4,245.7	442.2
43	NA	100	650	NA	~600	NA	4,245.7	442.2
44	NA	Ambient	305	NA	~600	NA	4,245.7	442.2
45	NA	Ambient	1,400	NA	~600	NA	4,245.7	442.2
46	NA	Ambient	1,081	NA	~600	NA	4,245.7	442.2
47	NA	Ambient	300	NA	~600	NA	4,245.7	442.2
49	NA	100	2,300	NA	~600	NA	4,245.7	442.2
20	NA	Ambient	300	NA	~600	NA	4,245.7	442.2

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☒ Yes ☐ No ☒ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM PM10 PM2.5	24.47 4.76 0.17	4.47 0.87 0.04	24.47 4.76 0.17	4.47 0.87 0.04	EE
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations[5]	Volatile Organic Compounds Methanol	11.68 3.18	23.0 1.15	11.68 3.18	23.0 1.15	O
Equipment Leaks[6]	Volatile Organic Compounds	3.82	16.73	3.82	16.73	O
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[5] US EPA WATER9 Version 2.0 used to model WWTP air emissions.

[6] US EPA Protocol for Equipment Leak Estimates EPA-453/R-98-077 November 1995 Table 2-1 SOCMI Average Emission Factors

ATTACHMENT L

EMISSION UNIT DATA SHEETS

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Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): WWTP

1. Name or type and model of proposed affected source: Wastewater Treatment Plant
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: 400 gallons per minute of wastewater
4. Name(s) and maximum amount of proposed material(s) produced per hour: 400 gallons per minute of effluent
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ Ambient temperature °F and Ambient Pressure psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	NA	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	11.68	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	Methanol	3.18	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
• Incoming ethanol and methanol concentrations weekly • Wastewater outlet flow	• Incoming ethanol and methanol concentrations • Wastewater outlet flow
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 10

1. Name or type and model of proposed affected source:

   Pug Mill/51 Mill Process

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. Up to 4,410 lb/hr each Organo Clay Based Rhelogical Additive.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The production rate is variable depending on the product being produced. Up to 4,410 lb/hr each Organo Clay Based Rhelogical Additive.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	Days/Week	Weeks/Year

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 220 °F and 14.7 psia

a.	NO_X		lb/hr	NA grains/ACF
b.	SO_2		lb/hr	NA grains/ACF
c.	CO		lb/hr	NA grains/ACF
d.	PM_{10}	0.0138	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs		lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS VOC		lb/hr	NA grains/ACF
	HAP Metal		lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 3

1. Name or type and model of proposed affected source:

   Flash Dryer System

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr Organo Clay Based Rhelogical Additive.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr Organo Clay Based Rhelogical Additive.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas @ 10,000 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

10,000,000 but/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 10 $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 210 °F and 14.7 psia

a.	NO_X	0.98	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.82	lb/hr	NA grains/ACF
d.	PM_{10}	3,675	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	3.06	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS - VOC	0.02	lb/hr	NA grains/ACF
	HAPS-Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 18

1. Name or type and model of proposed affected source: Boiler 1 (Kewanee Boiler Model H-3S-600-G02)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: NA
4. Name(s) and maximum amount of proposed material(s) produced per hour: 20,700 lb/hr steam
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas @ 20,085 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

20,085,000 btu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 25.106 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	1.97	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	1.65	lb/hr	NA grains/ACF
d.	PM_{10}	0.15	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.11	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS – VOC	0.04	lb/hr	NA grains/ACF
	HAPS - Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): CO-320001

1. Name or type and model of proposed affected source: Wheelbrator Clean Air Systems (ARI) ECON-ABATOR, Model # C-5000 PAB-G-60 TE Oxidizer
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: Oxidizer controls VOC emissions
4. Name(s) and maximum amount of proposed material(s) produced per hour: None
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: Typical combustion products

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas @ 3,000 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

3,000,000 btu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 3 $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	0.29	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.25	lb/hr	NA grains/ACF
d.	PM_{10}	0.02*	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	8.55*	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS - VOC	0.01	lb/hr	NA grains/ACF
	HAPS – Metal	0.01	lb/hr	NA grains/ACF
	Methyl Chloride	0.06	lb/hr	grains/ACF
	HCl	0.65	lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

*Includes equipment controlled by oxidizer.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 19

1. Name or type and model of proposed affected source:

   Hot Water Heater – Peerless: Model – 6-1161-WP

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   NA

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   Not applicable

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas @ 400 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

400,000 btu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 0.1 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@	300	°F and	14.7	psia
a. NO_X	0.04	lb/hr	NA	grains/ACF
b. SO_2	0.01	lb/hr	NA	grains/ACF
c. CO	0.04	lb/hr	NA	grains/ACF
d. PM_{10}	0.01	lb/hr	NA	grains/ACF
e. Hydrocarbons	NA	lb/hr	NA	grains/ACF
f. VOCs	0.01	lb/hr	NA	grains/ACF
g. Pb	NA	lb/hr	NA	grains/ACF
h. Specify other(s)				
HAPS-VOC	0.01	lb/hr	NA	grains/ACF
HAPS-Metal	0.01	lb/hr	NA	grains/ACF
		lb/hr		grains/ACF
		lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 017

1. Name or type and model of proposed affected source:

   West 1st Stage Fluid Bed Dryer

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas 5,250 scf/hour

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: NA

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

5,250,000 btu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 5.25 $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	0.51	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.43	lb/hr	NA grains/ACF
d.	PM_{10}	2,205	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.81	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS VOC	0.01	lb/hr	NA grains/ACF
	HAPS Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 018

1. Name or type and model of proposed affected source:

   West 2nd Stage Fluid Bed Dryer

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   NA

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas 5,250 scf/hour

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: NA

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

5,250,000 btu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 5.25 $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	0.51	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.43	lb/hr	NA grains/ACF
d.	PM_{10}	2,205	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.81	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS VOC	0.01	lb/hr	NA grains/ACF
	HAPS Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 019

1. Name or type and model of proposed affected source:

   East 1st Stage Fluid Bed Dryer

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas 5,250 scf/hour

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: NA

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Gas Burner

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 5.25 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	0.51	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.43	lb/hr	NA grains/ACF
d.	PM_{10}	2,205	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.81	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS VOC	0.01	lb/hr	NA grains/ACF
	HAPS Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 020

1. Name or type and model of proposed affected source: East 2nd Stage Fluid Bed Dryer
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product
4. Name(s) and maximum amount of proposed material(s) produced per hour: The process charge rate is variable depending on the product being produced. 2,205 lb/hr Organo Clay Product
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural Gas 5,250 scf/hour

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: NA

Pipeline quality natural gas

(c) Theoretical combustion air requirement (ACF/unit of fuel):

9.9 acf/scf @ 77 °F and 14.7 psia.

(d) Percent excess air: 4% to 7%

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Gas Burner

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: NA

(g) Proposed maximum design heat input: 5.25 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 300 °F and 14.7 psia

a.	NO_X	0.51	lb/hr	NA grains/ACF
b.	SO_2	0.01	lb/hr	NA grains/ACF
c.	CO	0.43	lb/hr	NA grains/ACF
d.	PM_{10}	2,205	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.81	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	HAPS VOC	0.01	lb/hr	NA grains/ACF
	HAPS Metal	0.01	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	Natural Gas use for the site on a monthly basis.
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 9C

1. Name or type and model of proposed affected source: Pug Mill Feed Hopper
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 4,410 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A Storage and transfer and raw materials
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form.*

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule: 800 hours per year

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	6.92	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 9A

1. Name or type and model of proposed affected source: Clay Storage Silos A-F (6)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 50,000 lb/hr – Clay
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A Storage and transfer and raw materials
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule: 800 hours per year

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	78.50	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 9B

1. Name or type and model of proposed affected source: Day Bin
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 50,000 lb/hr – Clay
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A Storage and transfer and raw materials
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule: 800 hours per year

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	78.50	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 7B

1. Name or type and model of proposed affected source: Straight Line Filter and Parkson A Vapor Hood
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.18	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 7-17A

1. Name or type and model of proposed affected source: 2 Vacuum Pumps (A-Side and C-Side Vacuum Pumps)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr each – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	NA	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	140.80	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	Methyl Chloride	1.30	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 13

1. Name or type and model of proposed affected source: Haver A Packer
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. Up to 3,675 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_x	NA	lb/hr	NA	grains/ACF
b.	SO_2	NA	lb/hr	NA	grains/ACF
c.	CO	NA	lb/hr	NA	grains/ACF
d.	PM_{10}	5.77	lb/hr	NA	grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA	grains/ACF
f.	VOCs	NA	lb/hr	NA	grains/ACF
g.	Pb	NA	lb/hr	NA	grains/ACF
h.	Specify other(s)				
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF
			lb/hr		grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 009

1. Name or type and model of proposed affected source: Haver C Packer
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 4,410 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_x	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	6.92	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 2A

1. Name or type and model of proposed affected source: Dispersion Batch Tanks (2)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: 84,000 lb/hr of clay slurry @ 3,800 lb/hr clay @ 80,200 lb/hr water
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.08	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 2

1. Name or type and model of proposed affected source:

   Rx and Disp. Tanks (6)

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   84,000 lb/hr of clay slurry
   @ 3,800 lb/hr clay
   @ 80,200 lb/hr water

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   N/A

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.08	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
	Methylchloride	0.03	lb/hr	NA grains/ACF
	Benzylchloride	0.05	lb/hr	NA grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 5

1. Name or type and model of proposed affected source: ACM #2 Mill
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 3,675 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 16

1. Name or type and model of proposed affected source: ACM #1 Mill
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 3,675 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 007

1. Name or type and model of proposed affected source: West Rotary Vacuum Filter Vent
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 2,205 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.10	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	0.78	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 008

1. Name or type and model of proposed affected source: East Rotary Vacuum Filter Vent
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 2,205 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.10	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	1.78	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 17B

1. Name or type and model of proposed affected source: Eimco B Filter and Parkson B Vapor Hood
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 3,675 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.18	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 17C

1. Name or type and model of proposed affected source: Eimco C Filter Vapor Hood
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 4,410 lb/hr – Rheological Additive
4. Name(s) and maximum amount of proposed material(s) produced per hour: N/A
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.21	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 50

1. Name or type and model of proposed affected source:

   Parkson C Vapor Hood

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 4,410 lb/hr – Rheological Additive

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   N/A

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): NA

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 70 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	0.21	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 40

1. Name or type and model of proposed affected source:

   Bulk Sack Packer

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. Rheological Additive Bulk Sack Packing at 3,000 lb/hr

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   The process charge rate is variable depending on the product being produced. Rheological Additive Bulk Sack Packing at 3,000 lb/hr

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	4.71	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	TESTING
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 41

1. Name or type and model of proposed affected source: ACM #1 Feed Bin
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 3,675 lb/hr Organo Clay Product
4. Name(s) and maximum amount of proposed material(s) produced per hour: NA
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 42

1. Name or type and model of proposed affected source: ACM #2 Feed Bin
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: The process charge rate is variable depending on the product being produced. 3,675 lb/hr Organo Clay Product
4. Name(s) and maximum amount of proposed material(s) produced per hour: NA
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	5.77	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 43

1. Name or type and model of proposed affected source:

   51 Mill Recycle

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

   The process charge rate is variable depending on the product being produced. 4,410 lb/hr Organo Clay Product

4. Name(s) and maximum amount of proposed material(s) produced per hour:

   NA

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

   None

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable): Not Applicable

(a) Type and amount in appropriate units of fuel(s) to be burned:

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

(g) Proposed maximum design heat input: $\times 10^6$ BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ 100 °F and 14.7 psia

a.	NO_X	NA	lb/hr	NA grains/ACF
b.	SO_2	NA	lb/hr	NA grains/ACF
c.	CO	NA	lb/hr	NA grains/ACF
d.	PM_{10}	6.92	lb/hr	NA grains/ACF
e.	Hydrocarbons	NA	lb/hr	NA grains/ACF
f.	VOCs	NA	lb/hr	NA grains/ACF
g.	Pb	NA	lb/hr	NA grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
None	None
REPORTING	**TESTING**
None	None

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
NA

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Emissions Unit Data Sheet(s) ..... ATTACHMENT L

Air Pollution Control Device Sheet(s) ..... ATTACHMENT M

Supporting Emissions Calculations ..... ATTACHMENT N

Monitoring/Recordkeeping/Reporting/Testing Plans ..... ATTACHMENT O

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Preliminary Emissions Calculation Report (WWTP) ..... APPENDIX

Attachments Not Applicable to this Application: Attachments R and S.

SECTION I

GENERAL APPLICANT INFORMATION

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☒ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☒ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Elementis Specialties, Inc.

2. Federal Employer ID No. ***(FEIN):***
05-0495836

3. Name of facility *(if different from above):*
Charleston Facility

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
1003 MacCorkle Avenue, SW
Charleston, WV 25303

5B. Facility's present physical address:
1003 MacCorkle Avenue, SW
Charleston, WV 25303

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **NO**

⇨ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

⇨ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Elementis Global, LLC

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

⇨ If **YES,** please explain: Applicant owns the site.

⇨ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Modification to a rheological process to add the WWTP, update to throughput and hours of operation, and update process/facility information.

10. North American Industry Classification System **(NAICS)** code for the facility:
325188

11A. DAQ Plant ID No. (for existing facilities only):
039–00031

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-1847E

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- ⇨ For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- ⇨ For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

Plant entrance roadway intersects MacCorkle Avenue (State Route 61) at the C&O Railroad Bridge.

12.B. New site address (if applicable): NA	12C. Nearest city or town: Charleston	12D. County: Kanawha
12.E. UTM Northing (KM): 4,245.970	12F. UTM Easting (KM): 442.201	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
Permitting WWTP unit at the facility, removal of dry Bentone® process, increase the hours of operation for the facility, an increase in annual production, and update process/facility information.

14A. Provide the date of anticipated installation or change: ⇨ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: 04/01/2009 (WWTP) See Appendix.	14B. Date of anticipated Start-Up if a permit is granted: NA

14C. Provide a **Schedule** of the planned **Installation of/Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known)*. A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known)*. Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) .
⇨ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
⇨ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

⇨ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☒ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☒ Indirect Heat Exchanger	

☒ General Emission Unit, specify WWTP, combustion devices

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☒ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☒ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☐ **Responsible Official** / ☒ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 10/3/2014 *(Please use blue ink)*

35B. Printed name of signee: John Snodgrass		35C. Title: Plant Manager
35D. E-mail: John.Snodgrass@elementis.com	36E. Phone: (304) 342-8103	36F. FAX: (304) 342-7308
36A. Printed name of contact person (if different from above): Gregory Toman		36B. Title: EH&S Manager
36C. E-mail: Gregory.Toman@elementis.com	36D. Phone: (304) 342-8103	36E. FAX: (304) 342-7308

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☒ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
ELEMENTIS SPECIALTIES, INC.
1003 MACCORKLE AVE SW
CHARLESTON, WV 25303-1323

BUSINESS REGISTRATION ACCOUNT NUMBER: **1006-6971**

This certificate is issued on: 02/1/2013

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

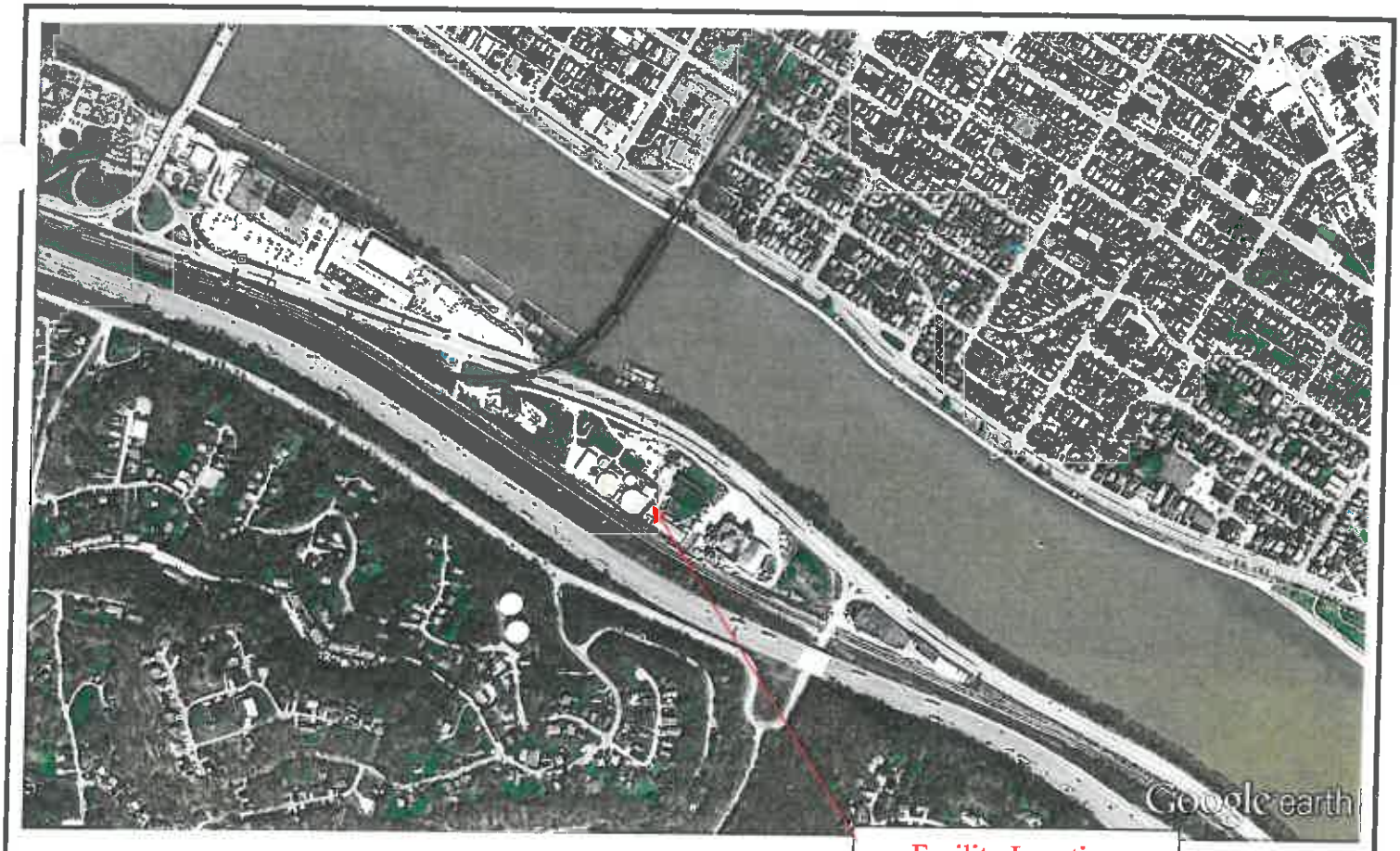
This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

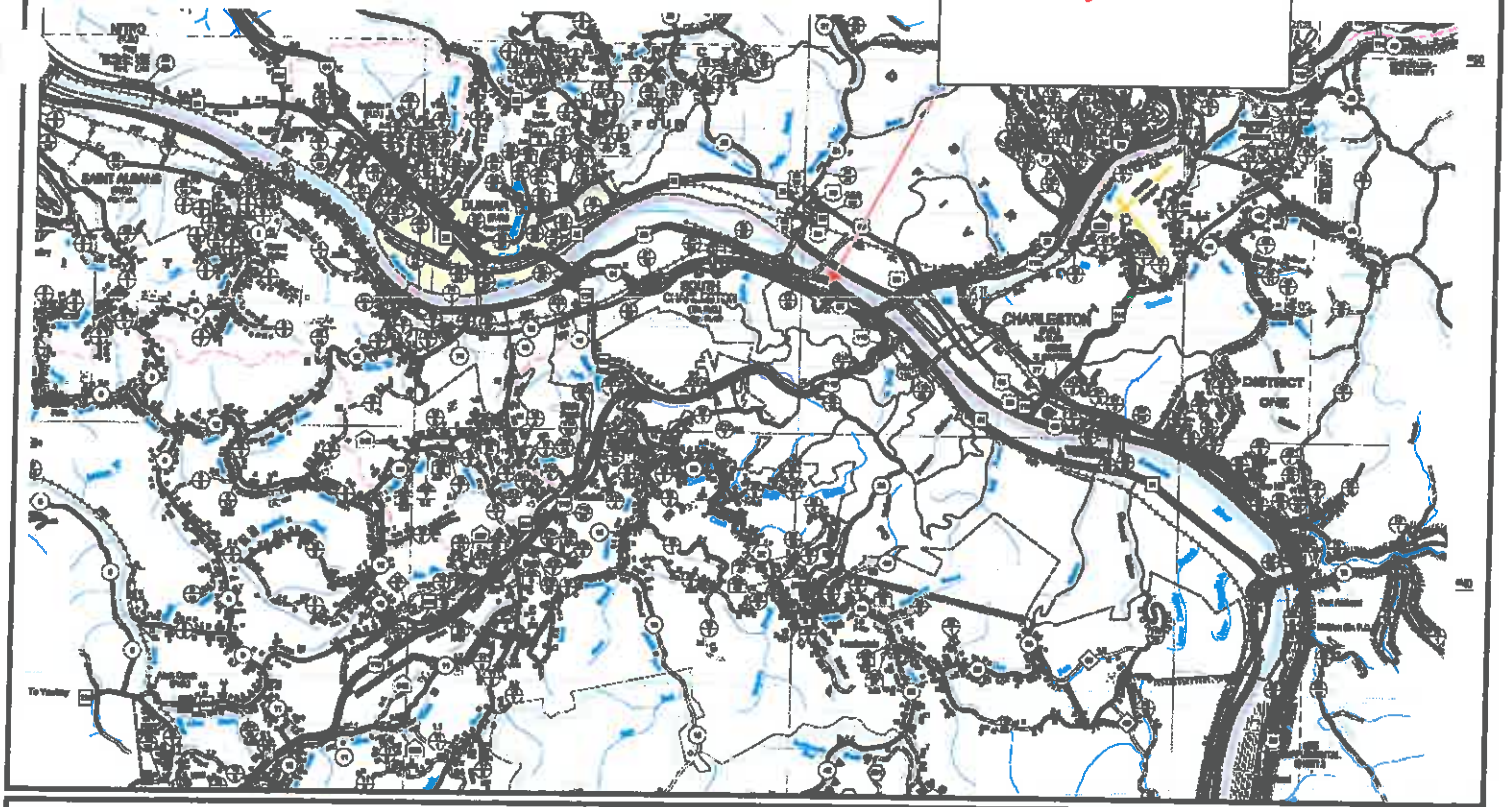
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
L0909319040



Facility Location



POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, S.E
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Elementis Specialties, Inc.
Charleston Facility
Kanawha County, West Virginia

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

Elementis Specialties, Inc. installed the initial wastewater treatment system (sequencing batch reactors) in 2003. The wastewater treatment system was modified to the current configuration in April 2009. The Dry Bentone process was discontinued and removed from service in July 2010. This application reflects the current operations of the facility.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

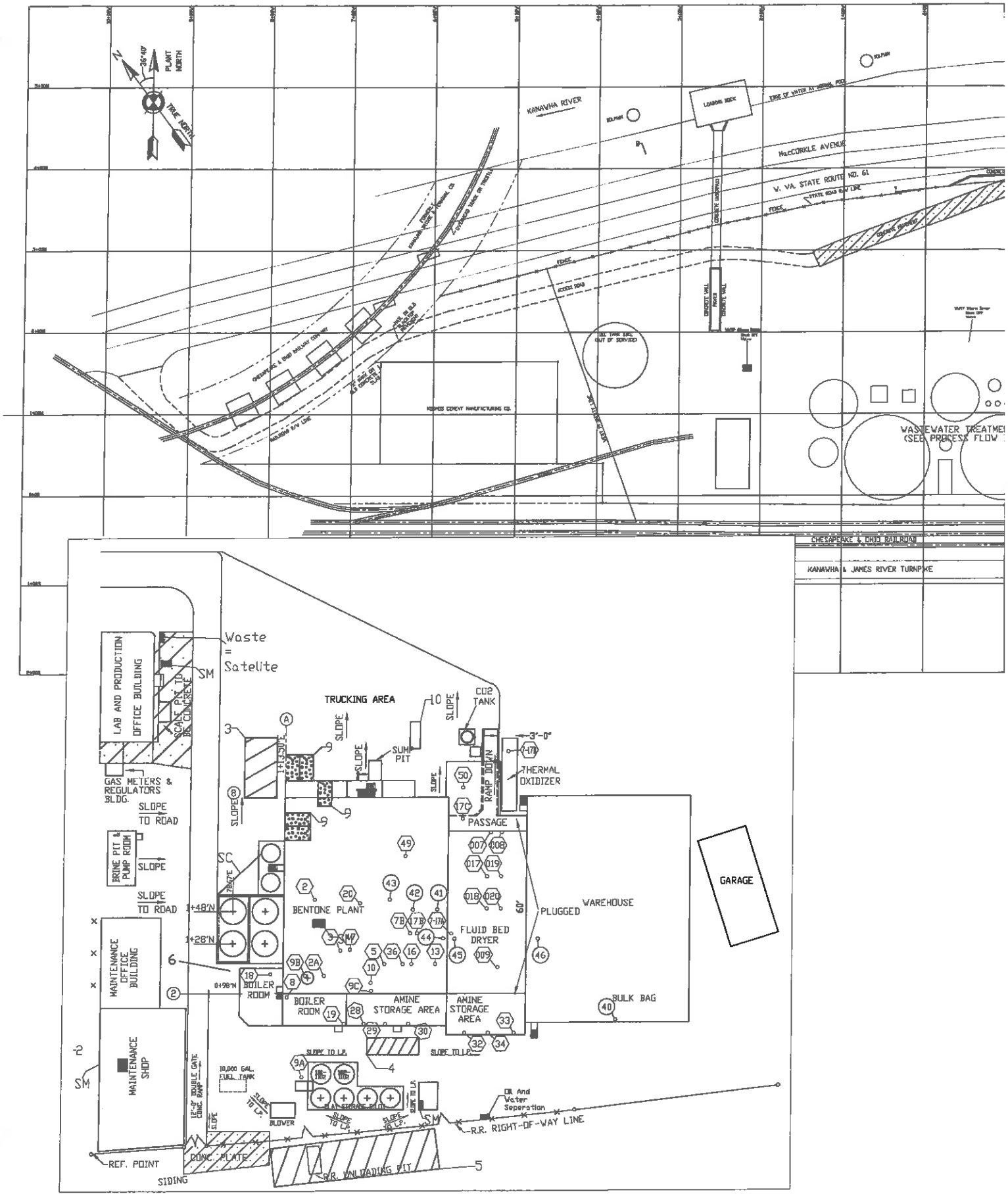
REGULATORY DISCUSSION

Elementis Specialties, Inc. (Elementis) is requesting that its existing R13-1847E permit be modified to include secondary emissions from the Wastewater Treatment Plant (WWTP) installed in 2003 and reconfigured in 2009 and to remove the Dry Bentone process.

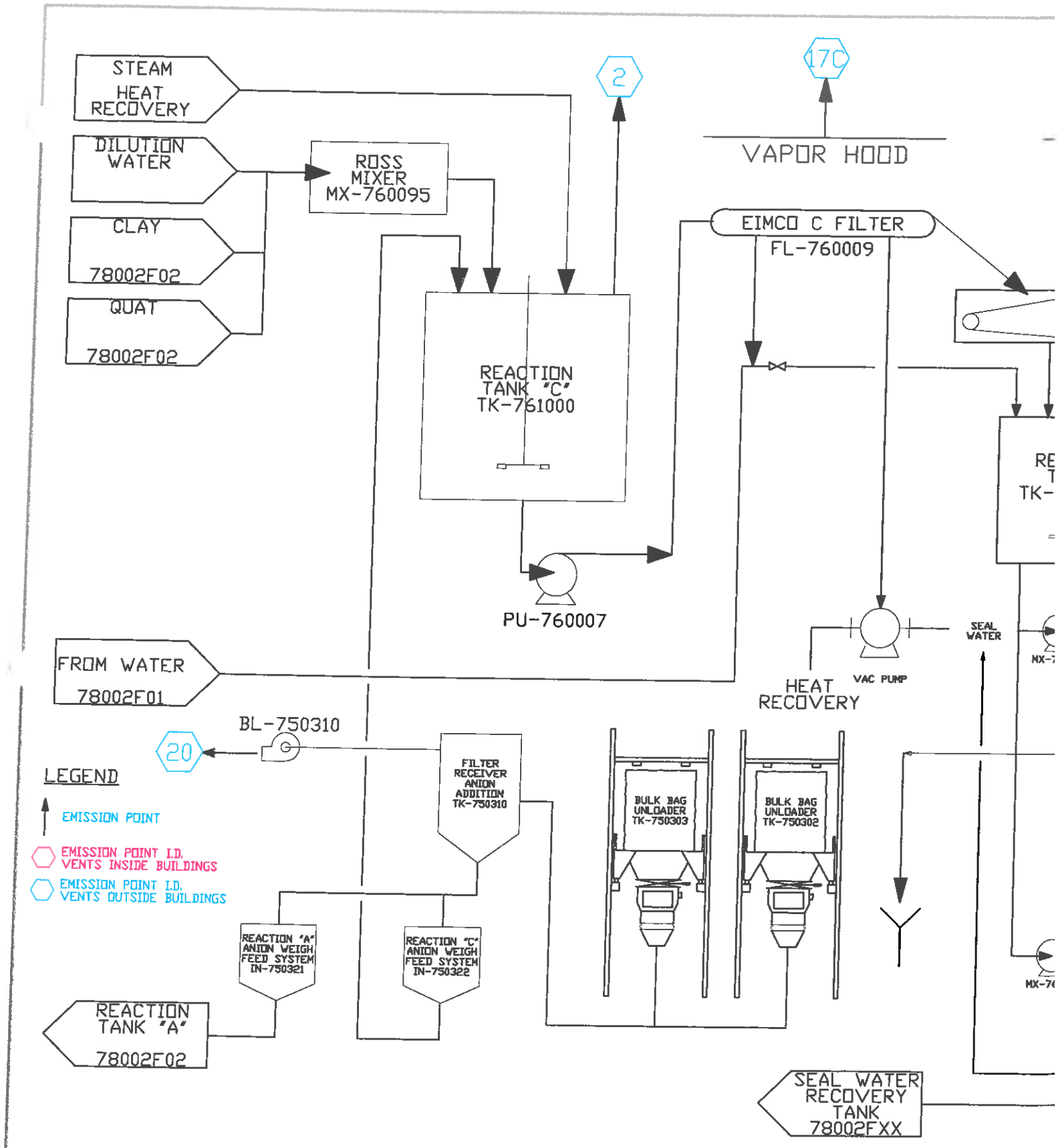
1. 45CSR2 – "To Prevent and Control Particulate Air Pollution for Combustion of Fuel in Indirect Heat Exchangers". The sources subject are Catalytic Oxidizer (7-17B), Flash Dryer (3), Kewanee Boiler (18), Gas Heater (19), West 1st Stage FBD (017), West 2nd Stage FBD (018), East 1st Stage FBD (019), and East 2nd Stage FBD (020).
2. 45CSR6 – "To Prevent and Control Air Pollution for Combustion of Refuse". The Catalytic Oxidizer (7-17B) remains subject to 45CSR6.
3. 45CSR7 – "To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations". Particulate emitting process sources are subject to 45CSR7.
4. 45CSR10 – "To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides" The sources subject are Catalytic Oxidizer (7-17B), Flash Dryer (3), Kewanee Boiler (18), Gas Heater (19), West 1st Stage FBD (017), West 2nd Stage FBD (018), East 1st Stage FBD (019), and East 2nd Stage FBD (020).
5. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation". Regulation 13 Permit R13-1847E is proposed to be revised by removing the Dry Bentone process, adding missing process equipment and secondary emissions from the WWTP and changing the days of operation from 350 days per year to 365 days per year.
6. 45CSR21 – "To Prevent and Control Air Pollution from the Emissions of Volatile Organic Compounds". The before control maximum theoretical emissions from the facility are greater than 100 tons per year so the facility is subject to 45CSR21. The Catalytic Oxidizer (7-17B) was installed as Reasonably Available Control Measures (RACM) for the facility. Wastewater Treatment Facilities are specifically exempted from 45CSR21 requirements by 45CSR21-40.1.d.

ATTACHMENT E

PLOT PLAN

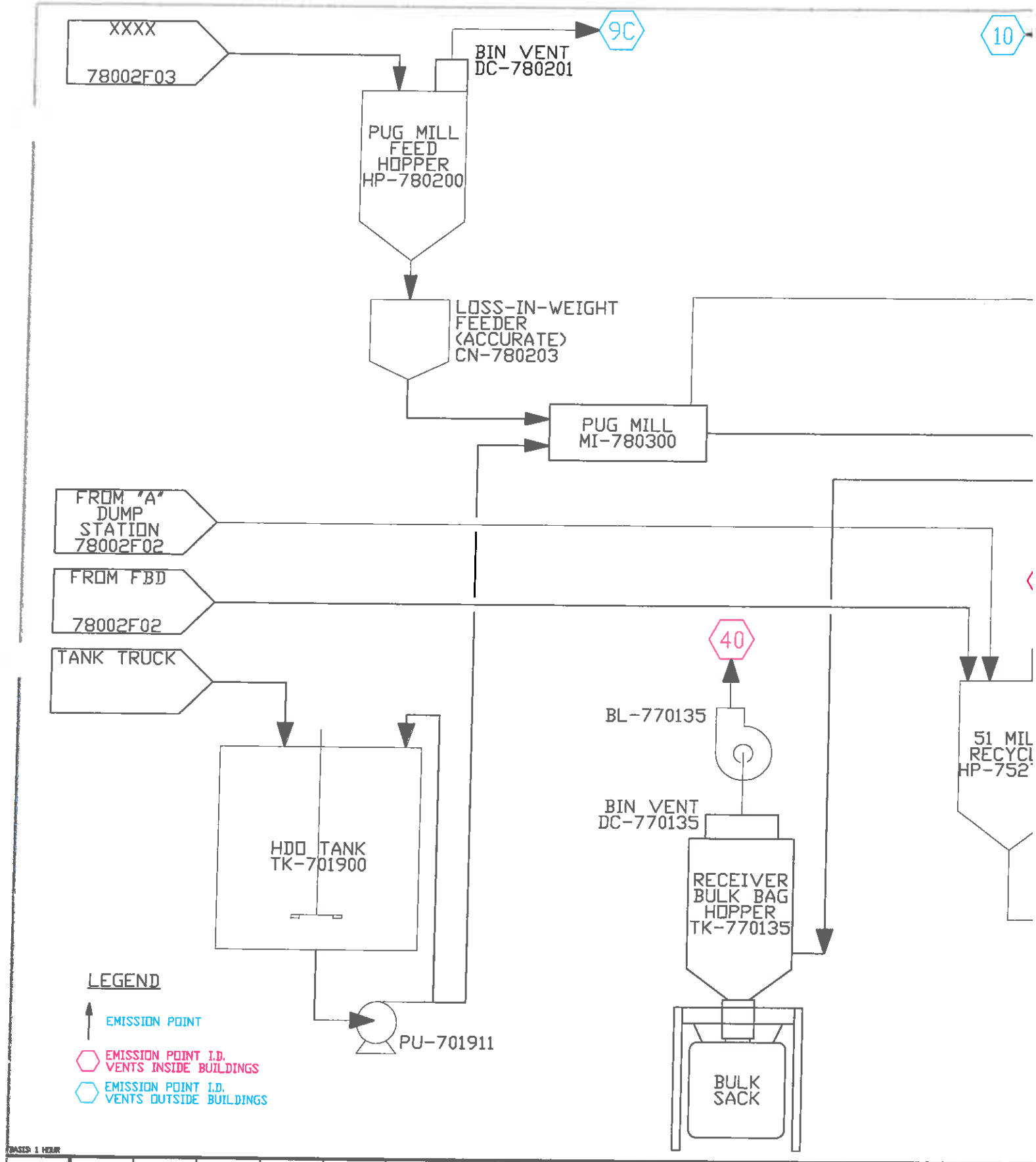


PLANT NORTH
TRUE NORTH
KANAWHA RIVER
LOADING DOCK
EDGE OF WATER AT NORMAL POOL
McCORKLE AVENUE
W. VA. STATE ROUTE NO. 61
STATE ROAD R/W LINE
FENCE
ACCESS ROAD
CONCRETE WALL
CHESAPEAKE & OHIO RAILWAY CO.
RAILROAD R/W LINE
KOSMOS CEMENT MANUFACTURING CO.
WASTEWATER TREATME
(SEE PROCESS FLOW
CHESAPEAKE & OHIO RAILROAD
KANAWHA & JAMES RIVER TURNPIKE
LAB AND PRODUCTION OFFICE BUILDING
SCALE PIT TO BE CONCRETE
Waste = Satelite
SM
GAS METERS & REGULATORS BLDG.
SLOPE TO ROAD
BRINE PIT & PUMP ROOM
SLOPE
SLOPE TO ROAD
MAINTENANCE OFFICE BUILDING
MAINTENANCE SHOP
SM
REF. POINT
SIDING
CONC. PLATE
12'-0" DOUBLE GATE CONC. RAMP
10,000 GAL. FUEL TANK
BLOWER
TRUCKING AREA
SLOPE
SUMP PIT
CO2 TANK
3'-0"
THERMAL OXIDIZER
RAMP DOWN
PASSAGE
BENTONE PLANT
FLUID BED DRYER
PLUGGED
WAREHOUSE
GARAGE
BOILER ROOM
AMINE STORAGE AREA
BULK BAG
SLOPE TO L.P.
PLAT STORAGE BLDG.
Oil And Water Seperation
R.R. RIGHT-OF-WAY LINE
R.R. UNLOADING PIT
1+48'N
1+28'N
0+98'N
SC



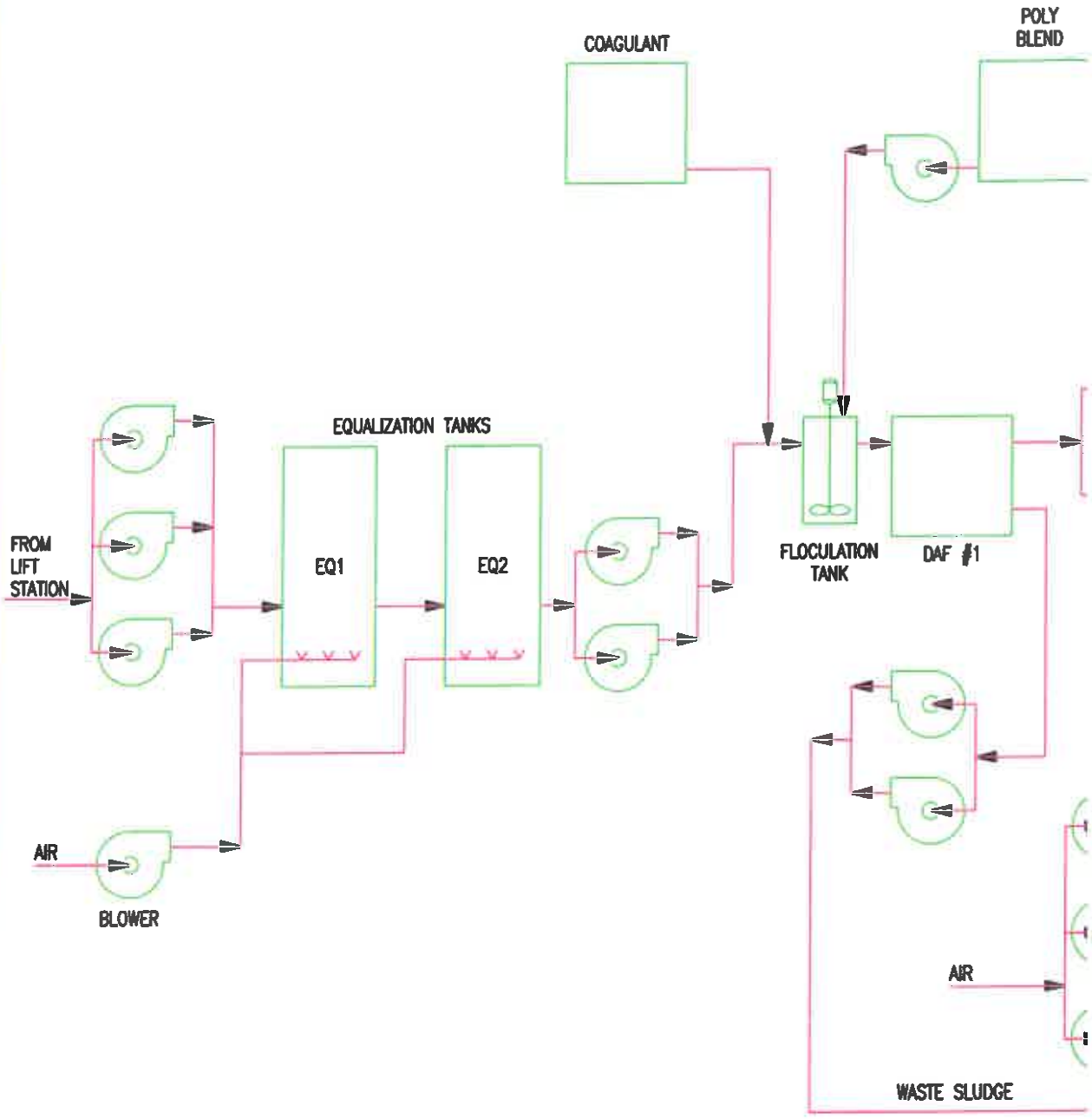
BASIS: 1 HOUR

COMPONENTS																
CLAY																
QUAT																
WATER																
STEAM																
ORGANO CLAY																
H2O																
WASH WATER																
SEAL WATER																
GAS																
AIR																



BASIS: 1 HOUR

COMPONENT																
CLAY																
GUM																
WATER																
STEAM																
ORGANO CLAY																
HDO																
WASH WATER																
SEAL WATER																
GAS																
AIR																



PREPARED FOR:
WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
CHARLESTON, WEST VIRGINIA

ON BEHALF OF:
ELEMENTIS SPECIALTIES, INC.
CHARLESTON, WEST VIRGINIA

ELEM
SPECIAL

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

Elementis Specialties, Inc. ("Elementis") operated wet and dry bentone processes under R13-1847E. In July 2010, the dry bentone process was discontinued and removed from service.

This requested modification would remove the dry bentone process, update process rates and equipment, and include emissions from the Wastewater Treatment Plant (WWTP). The facility manufactures rheological additives. The rheological additives consist of various dry powders, quaternary amines, and additives. The products are used in paints, coatings, printing inks, cosmetics, greases, drilling materials, etc. This requested update/modification would not change the products manufactured or the materials used in their manufacture. In addition, Elementis is requesting that the operating schedule be changed from 350 days a year to 365 days (8,760 hours per year) a year.

Production of Material (Wet Process) Bentone

The raw bentonite clay comes in powder form by rail car. It is then pneumatically conveyed to the silos (9A). The clay is pneumatically conveyed to the Day Bin (9B). It is then weighed and pneumatically conveyed to the dispersion tanks (2) where the clay is mixed with water to create a slurry mixture of 4.15% solids by an automatic batching system. The clay is then processed through the dispersion system which consists of an H&P Hydroclone (removal of heavier particles), centrifuges, ion exchanger (this step is used only if required by the raw material used and removes metallic ions and replaces them with sodium ions)], and blending tanks. There are no VOCs introduced in the dispersion system.

A Kewanee boiler (18) is used to provide steam to the process. A smaller gas fired heater (19) is used to supply heat to the process building.

Two liquid streams, Quatenary Amine and clay slurry, are pumped from holding tanks to the Ross Mixers for reaction in either Reactor A or Reactor C tanks- a clay slurry from the blending tanks and Quatenary Ammonium Chloride Salt (typically referred to as Quat or Quatenary Amine) stream from the Quat Tanks (28, 29, 30, 32, 33, or 34). The Quatenary Amine liquid stream contains ethanol as a solvent and is the sole source of VOCs in the process. Ethanol does not react in the system and is sent into either the wastewater system or to a catalytic oxidizer for destruction.

When Reactor A is fed, live steam is sparged into the reactor for temperature control. Reactor A overflows into Reactor B. Reactor B increases the retention time and is the feed tank for filtration.

When Reactor C is fed, live steam is sparged into the Reactor C for temperature control. Reactor C feeds directly into filtration.

The reacted slurry is fed to Straight Line Filter (7B) or EMICO Filter (17B) for vacuum filtration. The dewatered cake is fed to the Parkson Belt Presses. A spray wash is used to clean the filter media. This wash water is sent to the Used Wash Water Tank. The Vacuum Pumps (7-17A) vent to the Catalytic Oxidizer (7-17B) for reduction of VOCs. Filtrate from the filters goes to the wastewater treatment system after passing through a heat exchanger to preheat city water entering the plant's hot water system for use in the process.

The Parkson Belt Presses dewater the product by pressing the cake from the belt vacuum filters. This is a continuous process. The filtrate is collected in the Used Wash Water Tank for further processing.

Material can be dried using the Flash Dryer (3) or Fluid Bed Dryer (FBD) (017, 018, 019, and 020). When using the Flash Dryer, the filter cake from the Parkson Belt Press is mechanically conveyed to the hammer mill, pug mill (9C) and cage mill. Heated air is introduced into the cage mill along with the product. The heated air and product is separated in a dust collector. Control of dryer moisture is through the dry divider which controls the amount of material recycled. The dry divider discharge conveyor has the availability to introduce CO2 to cool the product.

When using the FBDs, the Parkson cake is mechanically conveyed to the re-pulp tank. The cake is re-pulped using the water from the Used Wash Water Tank along with fresh water, if needed. This slurry is then fed to the Rotary Drum Filters (007 & 008) and then to the fluid bed dryers (West 1st Stage FBD – 017, West 2nd Stage FBD – 018, East 1st Stage FBD – 019, and East 2nd Stage FBD – 020). Heated air (natural gas) is introduced into the fluid beds along with the product. The dust collection is directly above the beds. The vibrating motion of the beds moves the product forward.

The product is normally milled after the drying process. The Flash Dryer is fed to the ACM #1 system [ACM Bin Vent #1 (41) and ACM #1 (16)], ACM#2 system [ACM Bin Vent #2 (42) and ACM #2 (5)] and 51 Mill (10). The fluid bed dryer is fed directly to the ACM #1, ACM #2 and to the pug mill feed bin (9C). The pug mill system feeds to the 51 Mill for grinding.

The pug mill blending system is used to blend dry powders with a liquid stream or another dry powder. The blending can be done with fluid bed dryer product or other dry products dumped and conveyed to the receiving hopper.

The product is packed into multi-wall bags on either the Haver A (13- packer 44S- hopper) or the Haver C Packer (009). The product from ACM#1 and #2 can be packed on the Haver A Packer. The product from the 51 Mill system can be packed on either the Haver A or the Haver C Packer.

Wastewater Treatment

Wastewater from the wet bentone process is treated in the on-site WWTP system under WV NPDES permit WV0051560. The system is an activated sludge system designed to biologically treat VOCs (primarily ethanol) and remove solids before discharge to the Kanawha River.

The WWTP system consists of two equalization tanks, two aeration basins, two diffused air floatation tanks, and sludge tank. Wastewater from the wet bentone process enters Equalization Tank 1 (EQ1). EQ1 is supplied with air (to prevent the solids from settling in the tank) and recycle from the sludge tank. The wastewater then transfers to Equalization Tank 2 (EQ2). EQ2 is supplied with air. The wastewater then flows to the Diffused Air Floatation Tank 1 (DAF1). From the DAF1, the wastewater then flows to Aeration Basin 1 (AB1) followed by Aeration Basin 2 (AB2). Air is diffused in each basin using the same blower systems as the equalization tanks. Wastewater from AB2 is transferred to the Diffused Air Floatation Tank 2 (DAF2). From the DAF2, wastewater is sent to polishing filters before final discharge to the Kanawha River. Sludge from DAF1 and DAF2 is collected in the sludge tank. A portion of this sludge is recycled to the aeration basins and the rest is processed through the belt press. The press solids are sent to the landfill and the drainage liquid is returned to the equalization tanks.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS

ELEMENTIS SPECIALTIES

SAFETY DATA SHEET

Elementis Specialties Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: TRUVIS	Approval Date: April 16, 2008 Supercedes: February 20, 2002

2. PRODUCT COMPOSITION

Product Classification: Rheological Additive

HAZARDOUS SUBSTANCES	C.A.S. No.	Percent
Crystalline Silica - Quartz	14808-60-7	< 3.0%

3. HAZARD IDENTIFICATION

Warning:	**Protective Measures:**
May cause slight eye irritation. Long term overexposure to products containing Crystalline Silica may cause silicosis. IARC has classified Crystalline Silica as carcinogenic to humans.	Avoid contact with the eyes. Use in well ventilated areas. Do not breathe dust.

4. FIRST AID MEASURES

Eye Contact:	Rinse immediately with water for at least 15 minutes.
Skin Contact:	Wash with soap and water.
Ingestion:	Provide symptomatic treatment and seek medical attention.
Inhalation:	Remove person to fresh air. If breathing is difficult, provide oxygen and seek medical attention.
Other:	None known.

5. FIRE FIGHTING MEASURES

Flash Point: N.A.	**Method:** N.A.	**LEL:** 0.05 oz/ft^3	**UEL:** N.A.

EXTINGUISHING MEDIA/FIRE FIGHTING PROCEDURES

Water fog, foam, dry chemical, or carbon dioxide.

UNUSUAL HAZARDS

Precautions for flammable organic dusts should be provided. Avoid high dust concentrations. Assure all equipment is properly grounded to prevent static discharges, and vented to provide for potential energy release.

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ELEMENTIS SPECIALTIES

SAFETY DATA SHEET

Elementis Specialties Inc.
P.O. Box 700
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Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: TRUVIS	Approval Date: April 16, 2008 Supercedes: February 20, 2002

9. PROPERTIES

Appearance: Off White Powder	**Odor:** None	**pH:** N.A.
Boiling Range: N.A.	**Melting Range:** N.A.	**Specific Gravity:** Not measured.
Solubility: Insoluble.	**Vapor Density:** N.A.	**Vapor Pressure:** N.A.
% Volatile: N.A.	**Freezing Point:** N.A.	**Density at 20° C:** 1.6 g/cm^3

10. REACTIVITY INFORMATION

Conditions to Avoid:	Temperatures > 130°C
Materials to Avoid:	None known.
Hazardous Decomposition:	Use of this product in applications at temperatures > 130°C may release benzyl chloride.
Stability:	Stable.

11. HEALTH/TOXICITY INFORMATION

HEALTH HAZARDS

Effects of Acute Exposure

Inhalation: May cause slight irritation.
Skin Contact: Not expected to cause irritation.
Skin Absorption: Can not be absorbed through the skin.
Eye Contact: May produce slight (mechanical) irritation.
Ingestion: Not expected to produce adverse effects.

Effects of Chronic Over Exposure

Long term over exposure to products containing Crystalline Silica may cause silicosis. IARC has classified Crystalline Silica as carcinogenic to humans.
Listed as a suspected carcinogen on: IARC: Yes NTP: Yes-Respirable. OSHA: No
Medical Conditions Aggravated: Respiratory disorders.

TOXICITY INFORMATION

None determined.

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ELEMENTIS SPECIALTIES

SAFETY DATA SHEET

Elementis Specialties Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: DFE 430	Approval Date: April 16, 2008 Supercedes: July 23, 2002

2. PRODUCT COMPOSITION

Product Classification: Rheological Additive

HAZARDOUS SUBSTANCES	C.A.S. No.	Percent
Crystalline Silica - Quartz	14808-60-7	< 3.0%

3. HAZARD IDENTIFICATION

Warning:	**Protective Measures:**
May cause slight eye irritation. Long term exposure to airborne concentrations above the recommended exposure guidelines may cause lung damage. May cause silicosis. Contains Crystalline Silica which is classified by IARC as carcinogenic to humans.	Avoid contact with the eyes. Use in well ventilated areas. Do not breathe dust.

4. FIRST AID MEASURES

Eye Contact:	Rinse immediately with water for at least 15 minutes.
Skin Contact:	Wash with soap and water.
Ingestion:	Provide symptomatic treatment and seek medical attention.
Inhalation:	Remove person to fresh air. If breathing is difficult, provide oxygen and seek medical attention.
Other:	None known.

5. FIRE FIGHTING MEASURES

Flash Point: N.A.	**Method:** N.A.	**LEL:** 0.07 oz/cu. ft.	**UEL:** N.A.

EXTINGUISHING MEDIA/FIRE FIGHTING PROCEDURES

Water fog, foam, dry chemical, or carbon dioxide.

UNUSUAL HAZARDS

Normal precautions for organic dusts should be provided. Avoid high dust concentrations and ensure all equipment is properly grounded to prevent static discharges.

6. ACCIDENTAL RELEASE MEASURES

RELEASE RESPONSE

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Elementis Specialties Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: DFE 430	Approval Date: April 16, 2008 Supercedes: July 23, 2002

8. EXPOSURE CONTROL INFORMATION

Use good hygiene practices. Wash hands and face before eating or drinking.

9. PROPERTIES

Appearance: Off White Powder	**Odor:** None	**pH:** N.A.
Boiling Range: N.A.	**Melting Range:** Not determined.	**Specific Gravity:** 1.69 g/cm^3
Solubility: Insoluble.	**Vapor Density:** Not determined.	**Vapor Pressure:** N.A.
% Volatile: N.A.	**Freezing Point:** N.A.	**Density at 20° C:** Not measured.

10. REACTIVITY INFORMATION

Conditions to Avoid:	None known.
Materials to Avoid:	None known.
Hazardous Decomposition:	Ammonia and Carbon Dioxide.
Stability:	Stable.

11. HEALTH/TOXICITY INFORMATION

HEALTH HAZARDS

Effects of Acute Exposure

Inhalation: May cause slight irritation.
Skin Contact: Not expected to cause irritation.
Skin Absorption: Can not be absorbed through the skin.
Eye Contact: May produce slight (mechanical) irritation.
Ingestion: Not expected to produce adverse effects.

Effects of Chronic Over Exposure

Long term exposure to dust concentrations above recommended exposure guidelines may overload the lung clearance mechanism and cause adverse lung effects and shortness of breath. Long term over exposure to products containing Crystalline Silica may cause silicosis. IARC has classified Crystalline Silica as carcinogenic to humans.

Listed as a suspected carcinogen on: IARC: Yes NTP: Yes-Respirable. OSHA: No

Medical Conditions Aggravated: Respiratory disorders.

TOXICITY INFORMATION

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ELEMENTIS
SPECIALTIES

MATERIAL SAFETY DATA SHEET

Revision date: 04-Sep-2007 **Supercedes:** 19-Mar-2007 **MSDS Number:** 10826

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product name: OILGEL® 3000

Product Description: Self activated grease additive

Company/Undertaking Identification

Elementis Specialties, Inc.
329 Wyckoffs Mill Road
Hightstown, NJ 08520
(609) 443-2000

Elementis Specialties, Inc.
p/a Elementis Service Centre NV
Pegasus Park
De Kleetlaan 12A - P.O. Box 3
B-1831 Diegem, Belgium
+32 (0)2 790 76 00

Emergency telephone number: CHEMTREC Emergency Response Number: 1-800-424-9300 (1-703-527-3887)

SGS Emergency Response Number: + 32 (0)3 575 55 55

Product Stewardship@elementis.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: Powder
Color: Off-white
Odor: Odorless

WARNING

May cause slight eye irritation.
May cause irritation of respiratory tract.
CONTAINS CRYSTALLINE SILICA (QUARTZ) WHICH MAY CAUSE CANCER.
Repeated and/or prolonged exposures may cause lung damage (Silicosis).
Risk of cancer depends on level and duration of exposure.

Potential health effects:

Eye contact: May cause slight eye irritation. Signs and symptoms include burning, tearing, redness and swelling.

Skin contact: Non-irritating to the skin.

Inhalation: May cause irritation of respiratory tract. Long term exposure to airborne concentrations may cause lung damage.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Clean-up Methods: Sweep up and shovel into suitable containers for disposal. Clean spill area thoroughly. Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

Handling: Remove all sources of ignition. Avoid contact with skin, eyes and clothing. Avoid breathing mists, dusts, or vapors. Wash hands thoroughly after handling.

Storage: Keep containers tightly closed in a cool, well-ventilated place. Keep product and empty container away from heat and sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Maintain adequate ventilation to keep hazardous ingredients below their PELs or TLVs. Use NIOSH/MSHA approved respirator whenever exposure limits exceeded.

Personal Protective Equipment

Eye protection: Wear chemical goggles and/or full face shield as need.

Skin and body protection: Wear protective clothing and impervious gloves (natural rubber, neoprene) to avoid skin contact.

Respiratory protection: In the case of respirable dust and/or fumes, use self-contained breathing apparatus.

Hand protection: Protective gloves

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

Exposure controls

Components	OSHA STEL	OSHA PEL	OSHA TWA	ACGIH STEL	ACGIH TWA
Crystalline silica (Quartz)		0.1 mg/m^3 (respirable fraction)	0.1 mg/m^3 (respirable fraction)		0.025 mg/m^3 (respirable fraction)

TLV/PEL:
OSHA TWA

Nuisance Dust
15 mg/m^3 (total dust)
5 mg/m^3 (respirable fraction)

Components	NTP	IARC	OSHA
Crystalline silica (Quartz)	Group 2A	Group 1- Carcinogenic to Humans	Present

Specific effects

Carcinogenic effects: Crystalline silica has been reviewed by IARC. IARC working group found sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz or cristobalite from occupational sources. There is sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite. Therefore, IARC working group has classified Crystalline Silica as carcinogenic to humans (Group 1).

Target organ(s): Lungs

12. ECOLOGICAL INFORMATION

Aquatic toxicity:

Product Information: No data available

Persistence and degradability: No data available

Environmental Fate:

Mobility (soil/air/water): No data available

28-Day biodegradation: No data available

Bioaccumulative potential: No data available

Physical / Chemical: No data available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of in accordance with Local and National regulations.

RCRA Hazardous Waste

RCRA: Not listed

Section 302 EHS: None **Section 311/312:** Chronic Health Hazard

Section 313: Not listed

California Proposition 65:
This Product contains the following Chemical(s) known to the state of California to cause cancer and/or developmental effects.

Components	Carcinogen	Reproductive toxicity	No significant risk level
Crystalline silica (Quartz)	Listed		

Canada
WHMIS hazard class: D2A Possible, probable or known human carcinogen according to classifications by IARC or ACGIH.

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

HMIS:

Health:	1 *
Flammability:	0
Reactivity:	0

Previous Revision Date: 19-Mar-2007

Key/Legend:
N/A: Not applicable
N/D: Not determined
ppm: Parts per million
X: Listed

Prepared by: Product Stewardship

The data set forth in these sheets are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. ELEMENTIS SPECIALTIES makes no warranty with respect to the accuracy of the information provided by their suppliers, and declaims all liability of reliance thereon. ELEMENTIS SPECIALTIES warrants only that its products conforms with their published specifications, and no other express warranty is made with regards thereof. We do not guarantee favorable results, and we assume no liability in connection with the use of the products. They are intended for use by persons having technical skill and knowledge, at their own discretion and risk.

Elementis Specialties Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: PSA-1	Approval Date: May 11, 2006 Previous date: September 20, 1996

6. ACCIDENTAL RELEASE MEASURES

RELEASE RESPONSE

Minimize dusting. Caution: May cause a slippery condition when wet.
Sweep/shovel up and transfer into a drum for re-use or disposal.

PERSONAL PROTECTIVE EQUIPMENT

Wear an air-purifying dust respirator and chemical resistant gloves.
Wear eye protection to prevent dust from entering the eyes.

7. HANDLING AND STORAGE

HANDLING

Avoid high dust concentrations while handling through the use of ventilation or other suitable controls.
Ensure all equipment is grounded to prevent static discharge.

STORAGE

None.

8. EXPOSURE CONTROL INFORMATION

OCCUPATIONAL EXPOSURE LIMITS

	ACGIH - TLV	OSHA - PEL
Quartz:	0.1 mg/m^3	0.1 mg/m^3
Nuisance Dust:	8 hr. TWA - 10 mg/m^3, total	8 hr. TWA - 10 mg/m^3, total 8 hr. TWA - 5 mg/m^3, respirable

ENGINEERING CONTROL MEASURES

Use local exhaust ventilation if airborne concentrations are above recommended exposure limits.

PERSONAL PROTECTION EQUIPMENT

Respiratory:	Use an air-purifying dust respirator if airborne concentration levels are above exposure limits.
Hand:	Use chemical resistant gloves.
Eye:	Use safety glasses/goggles.
Other:	None.

OTHER CONTROL MEASURES

Use good hygiene practices. Wash hands and face before eating or drinking.

N.A.: Not Applicable

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ELEMENTIS SPECIALTIES

SAFETY DATA SHEET

Elementis Specialties Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

PRODUCT NAME: PSA-1	Approval Date: May 11, 2006 Previous date: September 20, 1996

11. HEALTH/TOXICITY INFORMATION

Based on this or similar product:	Oral LD_{50} (Rat): > 8,000 mg/kg; Primary Skin Irritation (Rabbit): Non-Irritating; Primary Eye Irritation (Rabbit): Mild Mechanical Irritation; Allergenicity (Guinea Pig): Non-Allergenic; Acute Inhalation Toxicity: No Toxic Manifestations.

ENVIRONMENTAL/DISPOSAL CONSIDERATIONS

12. ENVIRONMENTAL HAZARDS

None.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local and federal regulations. Use a licensed waste handler.

14. TRANSPORTATION

Shipping Name: Not regulated.		**Label:** N.A.
Hazard Class: N.A.	**Packing Group:** N.A.	**UN#:** N.A.

15. REGULATORY INFORMATION

CHEMICAL INVENTORIES In compliance denotes that all components are on the inventory or exempt.

U.S. TSCA Inventory:	On the Inventory	Canadian Inventory:	On the DSL
European Inventory:	On the EINECS	Australian Inventory:	On the Inventory
Japanese Inventory:	On the MITI	Koran Inventory:	On the Inventory

SARA 313 Information

Not regulated under SARA Section 313.

OTHER REGULATORY INFORMATION

WHMIS: Contains >0.1% Crystalline Silica.

16. OTHER INFORMATION

H.M.I.S. CODES	Health: 2*	Flammability: 1	Reactivity: 0

N.A.: Not Applicable

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Skin contact: Non-irritating to the skin.

Inhalation: May cause irritation of respiratory tract. Long term exposure to airborne concentrations may cause lung damage.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Principle routes of exposure: Inhalation, Skin, Ingestion

Target organ(s): Lungs

See Sections 11 & 12 for additional toxicological and ecological information

Environmental hazard: See Section 12, below

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components

Components	CAS-No	Weight %
Crystalline silica (Quartz)	14808-60-7	< 3%

This product is considered hazardous as defined under OSHA's Hazard Communication Standard (29 CFR 1910.1200).

4. FIRST AID MEASURES

Inhalation: Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If breathing is difficult, give oxygen.

Skin contact: Wash off immediately with soap and plenty of water. If a person feels unwell or symptoms of skin irritation appear, consult a physician.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.

Ingestion: If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting without medical advice. Do not give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

Flash Point: Not applicable

Autoignition temperature: Not selfigniting

Explosive properties: LEL: 0.07 oz/cu.ft.

Unusual Fire and Explosion Hazards: Emits toxic fumes under fire conditions. Excess dust dispersed in air represents an explosion hazard in the presence of electrical sparks and static discharges

Reactivity Hazard: None known

Components	OSHA STEL	OSHA PEL	OSHA TWA	ACGIH STEL	ACGIH TWA
Crystalline silica (Quartz)		0.1 mg/m³ (respirable fraction)	0.1 mg/m³ (respirable fraction)		0.025 mg/m³ (respirable fraction)

TLV/PEL: **Nuisance Dust**
OSHA TWA 15 mg/m³ (total dust)
5 mg/m³ (respirable fraction)

ACGIH TWA 10 mg/m³ (total dust)
3 mg/m³ (respirable fraction)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Powder
Color: Off-white
Odor: Odorless
Physical state: Solid
Solubility in Water: Insoluble
Specific gravity: 1.7
Flash Point: Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions

Conditions to avoid: Excessive heat, Open flame

Materials to avoid: Oxidizing agents

Hazardous decomposition products: Carbon monoxide, Carbon dioxide, Nitrogen oxides (NOx)

Possibility of Hazardous Reactions: Will not occur

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components	LC50/Inhalation/4h/Rat	LD50/Dermal/Rat	LD50/Oral/Rat
Crystalline silica (Quartz)	No data available	No data available	500 mg/kg

Local effects

Skin irritation: Non-irritating to the skin.

Eye irritation: Contact with eyes may cause irritation.

Inhalation: May cause irritation of respiratory tract.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR):

Proper shipping name: Not regulated

International Air Transportation (ICAO/IATA):

Proper shipping name: Not regulated

International Maritime Organization (IMO/IMDG):

Proper shipping name: Not regulated

Surface Shipments in Europe (ADR/RID):

Proper shipping name: Not regulated

15. REGULATORY INFORMATION

Heavy metals:

Heavy metals content (ppm): Not applicable

International Inventories

TSCA/ (USA)	Listed	**EINECS/ (EU)**	Listed
DSL/ (CANADA)	Listed	**NDSL/ (CANADA)**	Not applicable
ENCS/ (JAPAN)	Not Listed	**IECSC/ (CHINA)**	Listed
PICCS/ (PHILLIPINES)	Listed	**KECL (KOREA)**	Listed
AICS/ (AUSTRALIA)	Listed	**HSNO/ New Zealand:**	Listed

U.S. Regulations

TSCA Section 12(b) Export Notification

SARA Title III:

ELEMENTIS
SPECIALTIES

MATERIAL SAFETY DATA SHEET

Revision date: 25-Mar-2008 **Supercedes:** New MSDS **MSDS Number:** 12296

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name: ECONO-ELB 1

Product Use Description: Rheological additive

Company/Undertaking Identification

Elementis Specialties, Inc.
329 Wyckoffs Mill Road
Hightstown, NJ 08520
(609) 443-2000

Elementis Specialties, Inc.
p/a Elementis Service Centre NV
Pegasus Park
De Kleetlaan 12A - P.O. Box 3
B-1831 Diegem, Belgium
+32 (0)2 790 76 00

Emergency telephone number: CHEMTREC Emergency Response Number: 1-800-424-9300 (1-703-527-3887)

SGS Emergency Response Number: + 32 (0)3 575 55 55

Product Stewardship@elementis.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: Powder
Color: Off-white
Odor: Odourless

WARNING

Harmful by inhalation
May cause slight eye irritation
May cause irritation of respiratory tract
Repeated and/or prolonged exposures may cause lung damage (Silicosis)
CONTAINS CRYSTALLINE SILICA (QUARTZ) WHICH MAY CAUSE CANCER
Risk of cancer depends on level and duration of exposure

Potential health effects:

Eye contact: May cause slight eye irritation. Signs and symptoms include burning, tearing, redness and swelling.

Skin contact: Non-irritating to the skin.

Hazardous combustion products: Carbon monoxide, carbon dioxide (CO2), Nitrogen oxides (NOx).

Special Fire Fighting Procedure: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Clean-up methods: Sweep up and shovel into suitable containers for disposal. Clean spill area thoroughly. Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

Handling: Remove all sources of ignition. Avoid contact with skin, eyes and clothing. Avoid breathing mists, dusts, or vapors. Wash hands thoroughly after handling.

Storage: Keep containers tightly closed in a cool, well-ventilated place. Keep product and empty container away from heat and sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Maintain adequate ventilation to keep hazardous ingredients below their PELs or TLVs. Use NIOSH/MSHA approved respirator whenever exposure limits exceeded.

Personal Protective Equipment

Eye protection: Wear face protection

Skin and body protection: Wear protective clothing and impervious gloves (natural rubber, neoprene) to avoid skin contact.

Respiratory protection: In the case of respirable dust and/or fumes, use self-contained breathing apparatus.

Hand protection: Protective gloves

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

Exposure controls

Components	OSHA STEL	OSHA PEL	OSHA TWA	ACGIH STEL	ACGIH TWA
Crystalline silica (Quartz)		0.1 mg/m³ (respirable fraction)	0.1 mg/m³ (respirable fraction)		0.025 mg/m³ (respirable fraction)

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic toxicity: Long-term chronic toxicity studies to evaluate the carcinogenic potential of this product have not been conducted; See table and/or data, below, of individual components.

Components	NTP	IARC	OSHA
Crystalline silica (Quartz)	Group A - Known to be human carcinogens	Group 1- Carcinogenic to Humans	Present

Specific effects

Carcinogenic effects: Crystalline silica has been reviewed by IARC. IARC working group found sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz or cristobalite from occupational sources. There is sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite. Therefore, IARC working group has classified Crystalline Silica as carcinogenic to humans (Group 1).

Target Organs: Lungs

12. ECOLOGICAL INFORMATION

Aquatic toxicity:

Product Information: The data listed, below, is based on this or a similar product:

EC50/96hr/48hr/24hr > 2000 mg/L (Marine invertebrate; 48 hrs)
> 1000 mg/L (Marine alga; 48 hrs)

Persistence and degradability: No data available

Environmental Fate and Pathways:

Mobility: No data available

Biodegradability: No data available

Bioaccumulative potential: No data available

Physical / Chemical: No data available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of in accordance with Local and National regulations.

RCRA Hazardous Waste:

RCRA: Not listed

Section 302 EHS: None **Section 311/312:** Chronic Health Hazard

Section 313: Not listed

California Prop. 65:
This Product contains the following Substance (s) known to the state of California to cause cancer and/or developmental effects.

Components	Carcinogen	Reproductive toxicity	No significant risk level
Crystalline silica (Quartz)	Listed		

Canada
WHMIS hazard class: D2A Possible, probable or known human carcinogen according to classifications by IARC or ACGIH.

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

HMIS:
Health: 1 *
Flammability: 0
Reactivity: 0

Previous Revision Date: Not applicable
Key/Legend:
N/A: Not applicable
N/D: Not determined
ppm: Parts per million
X: Listed

Prepared by: Product Stewardship

The data set forth in these sheets are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. ELEMENTIS SPECIALTIES makes no warranty with respect to the accuracy of the information provided by their suppliers, and declaims all liability of reliance thereon. ELEMENTIS SPECIALTIES warrants only that its products conforms with their published specifications, and no other express warranty is made with regards thereof. We do not guarantee favorable results, and we assume no liability in connection with the use of the products. They are intended for use by persons having technical skill and knowledge, at their own discretion and risk.

Elementis Specialties, Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

1. PRODUCT NAME: VG PLUS	Approval Date: December 13, 2001

6. ACCIDENTAL RELEASE MEASURES

RELEASE RESPONSE

Minimize dusting. Caution: May cause a slippery condition when wet.
Sweep/shovel up and transfer into a drum for re-use or disposal.

PERSONAL PROTECTIVE EQUIPMENT

Wear an air-purifying dust respirator and chemical resistant gloves.
Wear eye protection to prevent dust from entering the eyes.

7. HANDLING AND STORAGE

HANDLING

Precautions for flammable organic dusts should be provided. Avoid high dust concentrations. Assure all equipment is properly grounded to prevent static discharges, and vented to provide for potential energy.

STORAGE

None.

8. EXPOSURE CONTROL INFORMATION

OCCUPATIONAL EXPOSURE LIMITS

	ACGIH - TLV	OSHA - PEL
Particulates not otherwise classified:	8 hr. TWA - 10 mg/m³, Inhalable 8 hr. TWA - 3 mg/m³, respirable	8 hr. TWA - 10 mg/m³, total 8 hr. TWA - 5 mg/m³, respirable
Quartz:	8 hr. TWA - 0.1 mg/m³, respirable	8 hr. TWA - 0.1 mg/m³, respirable

ENGINEERING CONTROL MEASURES

Use local exhaust ventilation if airborne concentrations are above recommended exposure limits.

PERSONAL PROTECTION EQUIPMENT

Respiratory:	Use an air-purifying dust respirator if airborne concentration levels are above exposure limits.
Hand:	Use chemical resistant gloves.
Eye:	Use safety glasses/goggles.
Other:	None.

OTHER CONTROL MEASURES

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ELEMENTIS SPECIALTIES

SAFETY DATA SHEET

Elementis Specialities, Inc.
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No.
CHEMTREC: (800) 424-9300
ELEMENTIS: (609) 443-2000

1. PRODUCT NAME: VG PLUS	Approval Date: December 13, 2001

11. HEALTH/TOXICITY INFORMATION

None determined.

ENVIRONMENTAL/DISPOSAL CONSIDERATIONS

12. ENVIRONMENTAL HAZARDS

None known.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local and federal regulations. Use a licensed waste handler.

14. TRANSPORTATION

Shipping Name: Not regulated.		**Label:** N.A.
Hazard Class: N.A.	**Packing Group:** N.A.	**UN#:** N.A.

15. REGULATORY INFORMATION

CHEMICAL INVENTORIES In compliance denotes that all components are on the inventory or exempt.

U.S. TSCA Inventory:	On the Inventory	Canadian DSL:	On the Inventory
European Inventory:	On the EINECS	Australia AICS:	On the Inventory
Korean Inventory	On the Inventory	Philippine Inventory:	On the Inventory
New Zealand - Pending	Submitted for the Inventory	Chinese Inventory:	On the Inventory

SARA 313 Information

Not regulated under SARA Section 313.

OTHER REGULATORY INFORMATION

WHMIS: Contains >0.1% Crystalline Silica.

16. OTHER INFORMATION

H.M.I.S. CODES	Health: 2	Flammability: 1	Reactivity: 0

N.A.: Not Applicable

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MATERIAL SAFETY DATA SHEET INDEX
RAW MATERIALS - QUATS
PLANT

2M2HT – E7030
B2MHT – E7032
MB2HT – E7044

scan these in
+ label
"MSDSs - Quats"

Section 3. Composition/ Information on Ingredients

Name	CAS #	% by Weight
quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides	61789-72-8	70-85
ethanol	64-17-5	10-25
Isopropanol	67-63-0	0-5
water	7732-18-5	5-10
quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides	61788-78-1	1-4
Dimethyl (hydrogenated tallowalkyl) amine hydrochlorides	Not Assigned	0.001-2
Amines, (hydrogenated tallow alkyl)dimethyl	61788-95-2	0.001-2
benzyl chloride	100-44-7	<0.1
methyl chloride	74-87-3	<0.03

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact Wash with soap and water. Get medical attention if irritation develops. Cold water may be used.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Medical Conditions Aggravated by Overexposure Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section 5. Fire Fighting Measures

Flammability of the Product Flammable.

Auto-ignition Temperature The lowest known value is 398.85°C (749.9°F) (ethanol).

Flash Points Closed cup: 37.8°C (100°F). (Pensky-Martens.)

Flammable Limits The greatest known range is LOWER: 3.3% UPPER: 19% (ethanol)

Products of Combustion These products are carbon oxides (CO, CO_2), nitrogen oxides (NO, NO_2...).

Fire Fighting Media and Instructions SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Protective Clothing (Fire) Be sure to use an approved/certified respirator or equivalent.

Special Remarks on Fire Hazards No sparking tools should be used. Take precautionary measures against static discharges.

Continued on Next Page

	OSHA PEL (United States, 1997). TWA: 1900 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 1900 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s).
Isopropanol	**ACGIH TLV (United States, 2005). Notes: ACGIH 2003 Adoption Refers to Appendix A -- Carcinogens.** STEL: 400 ppm 15 minute(s). Form: All forms TWA: 200 ppm 8 hour(s). Form: All forms **NIOSH REL (United States, 2001).** STEL: 1225 mg/m³ 15 minute(s). Form: All forms STEL: 500 ppm 15 minute(s). Form: All forms TWA: 980 mg/m³ 10 hour(s). Form: All forms TWA: 400 ppm 10 hour(s). Form: All forms **OSHA PEL (United States, 1997).** TWA: 980 mg/m³ 8 hour(s). Form: All forms TWA: 400 ppm 8 hour(s). Form: All forms **OSHA PEL 1989 (United States, 1989).** STEL: 1225 mg/m³ 15 minute(s). Form: All forms STEL: 500 ppm 15 minute(s). Form: All forms TWA: 980 mg/m³ 8 hour(s). Form: All forms TWA: 400 ppm 8 hour(s). Form: All forms
water	Not available.
quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides	Not available.
Dimethyl (hydrogenated tallowalkyl) amine hydrochlorides	Not available.
Amines, (hydrogenated tallow alkyl)dimethyl	Not available.
benzyl chloride	**ACGIH TLV (United States, 2005). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1996 Adoption Refers to Appendix A -- Carcinogens.** TWA: 5.2 mg/m³ 8 hour(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms **NIOSH REL (United States, 2001).** CEIL: 5 mg/m³ 15 minute(s). Form: All forms CEIL: 1 ppm 15 minute(s). Form: All forms **OSHA PEL (United States, 1997).** TWA: 5 mg/m³ 8 hour(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms **OSHA PEL 1989 (United States, 1989).** TWA: 5 mg/m³ 8 hour(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms
methyl chloride	**ACGIH TLV (United States, 2005). Skin Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1996 Adoption Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124) :36338-33351, June 30, 1993, for revised OSHA PEL. Refers to Appendix A -- Carcinogens.** STEL: 207 mg/m³ 15 minute(s). Form: All forms STEL: 100 ppm 15 minute(s). Form: All forms TWA: 103 mg/m³ 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms **OSHA PEL 1989 (United States, 1989). Notes: See Table Z-2.** STEL: 210 mg/m³ 15 minute(s). Form: All forms STEL: 100 ppm 15 minute(s). Form: All forms TWA: 105 mg/m³ 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms **OSHA PEL Z2 (United States, 1997).** AMP: 300 ppm 5 minute(s). Form: All forms CEIL: 200 ppm Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms

Continued on Next Page

quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides	LD50	>5000 mg/kg	Oral	Rat based on data for: (similar material)
Amines, (hydrogenated tallow alkyl)dimethyl	LD50	>2000 mg/kg	Oral	Rat
benzyl chloride	LD50	1231 mg/kg	Oral	Rat
	LD50	1500 mg/kg	Oral	Mouse
	LD50	1500 mg/kg	Oral	Mammal
methyl chloride	LD50	1800 mg/kg	Oral	Rat

Chronic Effects on Humans

CARCINOGENIC EFFECTS: Classified None. by NIOSH [ethanol]. Classified A4 (Not classifiable for human or animal.) by ACGIH [ethanol]. Classified None. by NIOSH [Isopropanol]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Isopropanol].
MUTAGENIC EFFECTS: Non-mutagenic for bacteria and/or yeast. [Isopropanol].
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [PROVEN] [ethanol].
Contains material which causes damage to the following organs: blood, the reproductive system, liver, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
Contains material which may cause damage to the following organs: gastrointestinal tract.

Special Remarks on Chronic Effects on Humans

quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides: Not Teratogenic

Acute Effects Skin

Practically non-toxic in contact with skin.

Acute Effects Eyes

Corrosive to the eyes.

Special Remarks on Other Toxic Effects on Humans

:
quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides: Skin and Eyes based on data for: (similar material)
quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides: Skin and Eyes and Sensitization based on data for: (similar material)

Section 12. Ecological Information

Ecotoxicity

Ingredient Name or Product name	Species	Period	Result
ethanol	Daphnia magna (EC50)	48 hour(s)	2 mg/l
	Daphnia magna (EC50)	48 hour(s)	9.3 mg/l
	Daphnia magna (EC50)	48 hour(s)	>100 mg/l
	Pimephales promelas (LC50)	96 hour(s)	>100 mg/l
	Daphnia magna (LC50)	96 hour(s)	>100 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	13000 mg/l
Isopropanol	Pimephales promelas (EC50)	48 hour(s)	10000 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	>1400 mg/l
	Pimephales promelas (LC50)	96 hour(s)	6550 mg/l
	Pimephales promelas (LC50)	96 hour(s)	9640 mg/l
	Pimephales promelas (LC50)	96 hour(s)	10400 mg/l
	Pimephales promelas (LC50)	96 hour(s)	11130 mg/l
quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides	Daphnia (EC50)	48 hour(s)	0.019 mg/l
benzyl chloride	Pimephales promelas (LC50)	96 hour(s)	5 mg/l
methyl chloride	Lepomis macrochirus (LC50)	96 hour(s)	550 mg/l

Continued on Next Page

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: ARQUAD® DMHTB-80 E
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ARQUAD® DMHTB-80 E: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313 Form R Reporting Requirements

Isopropanol	0-5

SARA 313 Supplier Notification

Isopropanol	0-5

State Regulations

Pennsylvania RTK: ethanol: (generic environmental hazard); Isopropanol: (environmental hazard, generic environmental hazard); benzyl chloride: (environmental hazard, generic environmental hazard); methyl chloride: (environmental hazard, generic environmental hazard)
Massachusetts RTK: ethanol; Isopropanol; benzyl chloride; methyl chloride
New Jersey: ethanol; Isopropanol; benzyl chloride; methyl chloride

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: benzyl chloride; methyl chloride
California prop. 65 (no significant risk level): benzyl chloride
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: methyl chloride
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: benzyl chloride

WHMIS (Canada)

Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides; ethanol; Isopropanol; water; quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides; Amines, (hydrogenated tallow alkyl)dimethyl; benzyl chloride; methyl chloride

European Union

Component	EC Number	EC Status	EC Annex
quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides	263-081-3	Not available.	Not available.
ethanol	200-578-6	Not available.	603-002-00-5
Isopropanol	200-661-7	Not available.	603-117-00-0
water	231-791-2	Not available.	Not available.
quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides	263-005-9	Not available.	Not available.
Dimethyl (hydrogenated tallowalkyl) amine hydrochlorides	Not available.	Not available.	Not available.
Amines, (hydrogenated tallow alkyl)dimethyl	263-022-1	Not available.	Not available.
benzyl chloride	202-853-6		602-037-00-3
methyl chloride	200-817-4	Not available.	602-001-00-7

Other International Lists

Australia (NICNAS): quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides; ethanol; Isopropanol; water; quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides; Amines, (hydrogenated tallow alkyl)dimethyl; benzyl chloride; methyl chloride

China: quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides; ethanol; Isopropanol; water; quaternary ammonium compounds, (hydrogenated tallow alkyl)trimethyl, chlorides; Amines, (hydrogenated tallow alkyl)dimethyl; benzyl chloride; methyl chloride

Germany water class: quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides; ethanol; Isopropanol; benzyl chloride; methyl chloride

Japan (MITI): ethanol; Isopropanol; water; benzyl chloride; methyl chloride

Japan (MOL): Isopropanol

Continued on Next Page

MB2HT

Material Safety Data Sheet

AKZO NOBEL

MSDS# 15-04303

Section 1. Chemical Product and Company Identification

Product name **ARQUAD® M2HTB ES E**

Material Uses : Surfactant.

Supplier/ Manufacturer

AKZO NOBEL SURFACE CHEMISTRY LLC
525 West Van Buren
Chicago, IL 60607-3823
www.surfactants.akzonobel.com

AKZO NOBEL CHEMICALS LTD.
1 City Centre Drive, Suite 318
Mississauga, Ontario L5B 1M2
Canada

In Case of Emergency

CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666
Medical/Handling:	914-693-6946
Product/Technical:	800-906-9977

Section 2. Hazards Identification

Physical State Liquid.

Color White to yellowish.

Odor Alcohol like.

ergency Overview

DANGER!
CAUSES EYE BURNS.
CONTAINS ETHANOL-CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, REPRODUCTIVE SYSTEM, LIVER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: GASTROINTESTINAL TRACT.
CONTAINS BENZYL CHLORIDE-A SUSPECTED CANCER HAZARD.
Risk of cancer depends on duration and level of exposure. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Avoid exposure during pregnancy. Wash thoroughly after handling.

Possible Carcinogenic Effects

quaternary ammonium compounds, benzylbis(hydrogenated tallow alkyl)methyl, chlorides: IARC, NTP, OSHA, ACGIH: Not listed.
ethanol: ACGIH A4; IARC NTP OSHA Not listed.
Isopropanol: IARC 3; ACGIH NTP OSHA Not listed.
water: IARC, NTP, OSHA, ACGIH: Not listed.
Amines, bis(hydrogenated tallow alkyl)methyl: IARC, NTP, OSHA, ACGIH: Not listed.
Bis(hydrogenated tallowalkyl)methylamines hydrochloride: IARC, NTP, OSHA, ACGIH: Not listed.
benzyl chloride: IARC 2A, ACGIH A3; NTP OSHA Not listed.
methyl chloride: ACGIH A4; IARC 3; NTP OSHA Not listed.

Routes of Entry Absorbed through skin. Eye contact.

See Toxicological Information (section 11)

Continued on Next Page

Section 6. Accidental Release Measures

Small Spill and Leak Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: **Use suitable protective equipment (Section 8).**

Large Spill and Leak Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. If the product is in its solid form: Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form: Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. **Use suitable protective equipment (Section 8).**

Section 7. Handling and Storage

Handling Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Storage Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls/ Personal Protection

Engineering Controls Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

Eyes	Face shield.
Body	Full suit.
Respiratory	Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Hands	Gloves.
Feet	Boots.

Protective Clothing (Pictograms)

Personal Protection in Case of a Large Spill Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Ingredient Name	Exposure Limits United States
quaternary ammonium compounds, benzylbis(hydrogenated tallow alkyl)methyl, chlorides	Not available.
ethanol	**ACGIH TLV (United States, 2006). Notes: 1996 Adoption Refers to Appendix A -- Carcinogens.** TWA: 1880 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **NIOSH REL (United States, 2001).** TWA: 1900 mg/m³ 10 hour(s). TWA: 1000 ppm 10 hour(s).

Continued on Next Page

Section 9. Physical and Chemical Properties

Physical State	Liquid.
Color	White to yellowish.
Odor	Alcohol like.
pH	Basic.
Boiling/Condensation Point	80°C (176°F)
Melting/Freezing Point	27°C (80.6°F)
Density	Not determined.
Vapor Pressure	Not determined.
Vapor Density	Not determined.
Odor Threshold	The lowest known value is 180 ppm (ethanol) Weighted average: 197.31 ppm
Evaporation Rate	The highest known value is 1.7 (ethanol) Weighted average: 1.56compared to Butyl acetate.
Solubility	Easily soluble in hot water, methanol, acetone. Partially soluble in cold water.
Dispersion Properties	See solubility in water, methanol, acetone.
Physical Chemical Comments	Freezing point= 24°C

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Incompatibility with Various Substances	Reactive with OXIDIZING AGENTS. Slightly reactive to reactive with acids.
Hazardous Decomposition Products	These products are halogenated compounds, hydrogen chloride.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

Toxicity to Animals

Ingredient Name or Product name	Test	Result	Route	Species
quaternary ammonium compounds, benzylbis(hydrogenated tallow alkyl)methyl, chlorides	LD50	>2000 mg/kg	Oral	Rat
ethanol	LD50	7060 mg/kg	Oral	Rat
	LD50	6300 mg/kg	Oral	Rabbit
	LD50	3450 mg/kg	Oral	Mouse
	LDLo	1400 mg/kg	Oral	human
	LDLo	5500 mg/kg	Oral	Dog
	LC50	20000 ppm (10 hour(s))	Inhalation	Rat
Isopropanol	LD50	5045 mg/kg	Oral	Rat
	LD50	6410 mg/kg	Oral	Rabbit
	LD50	3600 mg/kg	Oral	Mouse
	LD50	12800 mg/kg	Dermal	Rabbit
	LDLo	1537 mg/kg	Oral	Dog
	LDLo	3570 mg/kg	Oral	human
	LDLo	5272 mg/kg	Oral	man
	LC50	12000 ppm (8 hour(s))	Inhalation	Rat
	LC50	16970 ppm (4 hour(s))	Inhalation	Rat

Continued on Next Page

Section 13. Disposal Considerations

Waste information Waste must be disposed of in accordance with federal, state and local environmental control regulations.

RCRA Classification D001 ignitable Waste

Consult your local or regional authorities.

Section 14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional information
DOT Classification	UN1993	Flammable liquids, n.o.s. (ethanol, Isopropanol)	3 -	II		-
TDG Classification	UN1993	FLAMMABLE LIQUID, N.O.S. (ethanol, Isopropanol)	3 -	II		-
IMDG Class	UN1993	FLAMMABLE LIQUID, N.O.S. (ethanol, Isopropanol)	3 -	II		-
A-DGR Class	UN1993	Flammable liquid, n.o.s. (ethanol, Isopropanol)	3 -	II		-

Section 15. Regulatory Information

HCS Classification
Flammable liquid
Target organ effects
Corrosive Material

U.S. Federal Regulations

TSCA: All intentionally present components are listed on the TSCA inventory.

DSL: All intentionally present components are listed on the DSL.

TSCA 5(a)2 final significant rules: No products were found.

CERCLA: Hazardous substances.: benzyl chloride: 100 lbs. (45.36 kg); methyl chloride: 100 lbs. (45.36 kg);

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: ARQUAD® M2HTB ES E
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ARQUAD® M2HTB ES E: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313 Form R Reporting Requirements

Isopropanol	0-5
benzyl chloride	<0.2

Continued on Next Page

Section 16. Other Information

Hazardous Material Information System (U.S.A.)

National Fire Protection Association (U.S.A.)

Other Information Arquad® is a registered trademark of Akzo Nobel or affiliated companies and is registered in one or more countries including the United States.

Validation Date	5/14/2007.	**Validated by**	**Product Safety Specialist**
Previous Validation Date	10/26/2005.	**Print Date**	5/21/2007.
		Phone Number	**312-544-7038**

Notice to Reader

The information in the material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable as of the date of publication. However, no warranty is made as to the accuracy of and/or sufficiency of such information and/or suggestions or as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date on this document is more than three years old, call to make certain that this sheet is current.

quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, chlorides	61789-80-8	81-85
·nol	64-17-5	14
ar	7732-18-5	1-5
Bis(hydrogenated tallowalkyl)methylamines hydrochloride	Not Assigned	0.001-5
Amines, bis(hydrogenated tallow alkyl)methyl	61788-63-4	0.001-5
methyl chloride	74-87-3	<0.03

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Cold water may be used. Get medical attention.

Skin Contact In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Medical Conditions Aggravated by Overexposure Repeated or prolonged exposure is not known to aggravate medical condition.

Section 5. Fire Fighting Measures

·nmability of the ·oduct Flammable.

Auto-Ignition Temperature The lowest known value is 398.85°C (749.9°F) (ethanol).

Flash Points Closed cup: 37.8°C (100°F). (Pensky-Martens.)

Flammable Limits The greatest known range is LOWER: 3.3% UPPER: 19% (ethanol)

Products of Combustion These products are carbon oxides (CO, CO_2), nitrogen oxides (NO, NO_2...).

Fire Fighting Media and Instructions SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Protective Clothing (Fire) Be sure to use an approved/certified respirator or equivalent.

Special Remarks on Fire Hazards No sparking tools should be used. Take precautionary measures against static discharges.

Section 6. Accidental Release Measures

Small Spill and Leak Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill and Leak Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed.

Continued on Next Page

Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124) :36338-33351, June 30, 1993, for revised OSHA PEL. Refers to Appendix A -- Carcinogens.
STEL: 207 mg/m³ 15 minute(s). Form: All forms
STEL: 100 ppm 15 minute(s). Form: All forms
TWA: 103 mg/m³ 8 hour(s). Form: All forms
TWA: 50 ppm 8 hour(s). Form: All forms
OSHA PEL 1989 (United States, 1989). Notes: See Table Z-2.
STEL: 210 mg/m³ 15 minute(s). Form: All forms
STEL: 100 ppm 15 minute(s). Form: All forms
TWA: 105 mg/m³ 8 hour(s). Form: All forms
TWA: 50 ppm 8 hour(s). Form: All forms
OSHA PEL Z2 (United States, 1997).
AMP: 300 ppm 5 minute(s). Form: All forms
CEIL: 200 ppm Form: All forms
TWA: 100 ppm 8 hour(s). Form: All forms

Section 9. Physical and Chemical Properties

Physical State	Liquid.
Color	White.
Odor	Alcohol like.
pH	Not determined.
Boiling/Condensation Point	78.27°C (172.9°F)
Melting/Freezing Point	68°C (154.4°F)
Density	0.851 g/cm³ (25°C / 77°F)
Vapor Pressure	4.7 kPa (35 mmHg) (at 20°C)
Vapor Density	1.6 (Air = 1)
Odor Threshold	Not determined.
Evaporation Rate	1.7 compared to Butyl acetate.
Solubility	Easily soluble in cold water, hot water. Soluble in methanol, acetone.
Dispersion Properties	See solubility in water, methanol, acetone.
Physical Chemical Comments	Freezing point = 37°C

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Incompatibility with Various Substances	Reactive with OXIDIZING AGENTS. Slightly reactive to reactive with acids.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

Toxicity to Animals

Ingredient Name or Product name	Test	Result	Route	Species

Continued on Next Page

Section 14. Transport Information

gulatory information	UN number	Proper shipping name	Class	Packing Group	Label	Additional information
DOT Classification	UN1993	Flammable liquids, n.o.s. (ethanol)	3 -	III		-
TDG Classification	UN1993	FLAMMABLE LIQUID, N.O.S. (ethanol)	3 -	III		-
IMDG Class	UN1993	FLAMMABLE LIQUID, N.O.S. (ethanol)	3 -	III		-
IATA-DGR Class	UN1993	Flammable liquid, n.o.s. (ethanol)	3 -	III		-

Section 15. Regulatory Information

HCS Classification

Target organ effects
Reproductive toxin
Combustible liquid

U.S. Federal Regulations

TSCA: All intentionally present components are listed on the TSCA inventory.

DSL: All intentionally present components are listed on the DSL.

TSCA 5(a)2 final significant rules: No products were found.

CERCLA: Hazardous substances.: methyl chloride: 100 lbs. (45.36 kg);

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: ARQUAD® 2HT-83E ES
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ARQUAD® 2HT-83E ES: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313 Form R Reporting Requirements
No products were found.

SARA 313 Supplier Notification
No products were found.

State Regulations

Pennsylvania RTK: ethanol: (generic environmental hazard); methyl chloride: (environmental hazard, generic environmental hazard)
Massachusetts RTK: ethanol; methyl chloride
New Jersey: ethanol; methyl chloride

Continued on Next Page

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MATERIAL SAFETY DATA SHEET INDEX
RAW MATERIALS
PLANT

Additives

Sodium Chloride Salt
Sodium Stearate
HDO ® 1,6 Hexanediol E3008
Sodium Nitrate
SLS (Sodium Lauryl Sulfate
Sodium Benzoate E3009
Tetrasodium Pyrophosphate
Tetrasodium Pyrophosphate Anhydrous
Tetrasodium Pyrophosphate (FMC)
Tetrasodium Pyrophosphate (Olin)
Econ-Abrator © Catalyst

Scan all these MSDS + label pdf as "MSDS Raw Materials"

Extinguishing media	
Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	Not available
Protection of firefighters	
Specific hazards arising from the chemical	Not available
Protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.

6. Accidental Release Measures

Personal precautions	Before attempting clean up, refer to hazard data given above. Use broom or dry vacuum to collect material for proper disposal without raising dust. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Methods for containment	None necessary.
Methods for cleaning up	Before attempting clean up, refer to hazard data given above. Use broom or dry vacuum to collect material for proper disposal without raising dust. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

7. Handling and Storage

Handling	Avoid breathing dusts from this material.
Storage	Keep out of reach of children. Keep containers tightly closed in a cool, well-ventilated place.

8. Exposure Controls / Personal Protection

Exposure limits

Ingredient(s)	Exposure Limits
Sodium chloride	ACGIH-TLV Not established OSHA-PEL Not established

Engineering controls

TWA PEL: No specific limits have been established for sodium chloride (a soluble substance). As a guideline, OSHA (United States) has established the following limits which are generally recognized for inert or nuisance dust. Particulates Not Otherwise Regulated (PNOR): 5mg/cu.m. Respirable Dust 8-Hour TWA PEL, 15mg/cu.m. Total Dust 8-Hour TWA PEL.

TWA TLV: No specific limits have been established for sodium chloride (a soluble substance). As a guideline, ACGIH (United States) has established the following limits which are generally recognized for inert or nuisance dust. Particulates (Insolubles) Not Otherwise Classified (PNOC): 10mg/cu.m. Inhalable Particulate 8-Hours TWA TLV, 3mg/cu.m. Respirable Particulate TWA TLV.

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If user operations generate dust, fumes, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal protective equipment

Eye / face protection	Safety glasses.
Hand protection	Rubber gloves. Confirm with a reputable supplier first.
Skin and body protection	As required by employer code.
Respiratory protection	Where exposure guideline levels may be exceeded, use an approved NIOSH respirator or NIOSH-approved filtering facepiece.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. Wash hands before breaks and immediately after handling the product.

9. Physical & Chemical Properties

Appearance	Crystalline.
Color	White
Form	Crystals
Odor	Odorless.

Partition coefficient	Not available
Mobility in environmental media	Not available
Chemical fate information	Not available

13. Disposal Considerations

Waste codes	Not available
Disposal instructions	Waste must be disposed of in accordance with federal, state/provincial and local environmental control regulations.
Waste from residues / unused products	Not available
Contaminated packaging	Not available

14. Transport Information

Department of Transportation (DOT)

Not regulated as dangerous goods.

Transportation of Dangerous Goods (TDG)

Not regulated as dangerous goods.

15. Regulatory Information

Canadian federal regulations	This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
US Federal regulations	This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List. CERCLA/SARA Hazardous Substances - Not applicable.

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical	No

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substances	No
Section 311 hazardous chemical	No
Clean Air Act (CAA)	Not available
Clean Water Act (CWA)	Not available
Safe Drinking Water Act (SDWA)	Not available
Drug Enforcement Agency (DEA)	Not available
Food and Drug Administration (FDA)	Not available
WHMIS status	Not Controlled
State regulations	This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Inventory name

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

RTD * HALLSTAR
Material Safety Data Sheet

0283

Product: OP-100 TG HM Sodium Stearate **Revision Date: 11/27/01**

Section 1. Chemical Product and Company Identification

MANUFACTURER / SUPPLIER:

RTD HALLSTAR
1500 Rt. 517 Suite 305
Hackettstown, NJ 07840

Information Telephone: 908-852-6128
24-Hour Emergency Telephone (Chemtrec): 800-424-9300

PRODUCT NAME:	OP – 100 TG HM Sodium Stearate
CHEMICAL FAMILY:	Soap
FORMULA:	Mixture
CAS NUMBER:	Mixture

Section 2. Composition / Information on Ingredients

MATERIAL	CAS NUMBER	AMOUNT
Sodium Stearate	68309-30-8	

All ingredients are considered non-hazardous by OSHA and various environmental laws.

Section 3. Hazards Identification

POTENTIAL HEALTH EFFECTS:

INHALATION Dust may cause irritation
EYE: May cause irritation.
SKIN: Prolonged contact may cause irritation
INGESTION: None determined

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Irritation

Section 4. First Aid Measures

INHALATION:

Remove to fresh air

EYE CONTACT:

Promptly flush with water, holding the eyelids apart for 15 minutes. Seek medical attention.

SKIN CONTACT:

Wash contaminated skin with mild soap and water.

INGESTION:

Treat as a soap ingestion. Get medical attention..

NOTES TO PHYSICIAN (INCLUDING ANTIDOTES):

Treat symptomatically.

Section 5. Fire Fighting Measures

FLASH POINT (METHOD USED):

RTD * HALLSTAR

Material Safety Data Sheet

Product: OP-100 TG HM Sodium Stearate

Revision Date: 11/27/01

SPECIFIC GRAVITY	1.02
VAPOR PRESSURE (25 C)	NA
BOILING POINT	NA
APPEARANCE	fine white powder, fatty odor
% VOLATILE	NA
EVAPORATION RATE	NA
REACTIVITY IN WATER	NA

Section 10. Stability and Reactivity

STABILITY:
Stable
CONDITIONS TO AVOID:
Dusting
HAZARDOUS POLYMERIZATION:
Will not occur.
INCOMPATIBILITY (MATERIALS TO AVOID):
Strong oxidizing agents, flame, spark, ect. Under dust conditions.
HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Dioxide, Carbon Monoxide

Section 11. Toxicological Information

None available

IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?

IARC	NTP	OSHA
No	No	No

Section 12. Ecological Information

NO DATA

Section 13. Disposal Considerations

WASTE DISPOSAL METHOD:
Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. Incineration or landfill in accordance with all federal, state and local regulations.

Section 14. Transport Information

U.S. DOT SHIPPING NAME: Not Regulated
U.S. DOT HAZARD CLASS: Not Regulated

Section 15. Regulatory Information

Ingredients contained in this product are in compliance with TSCA.
Ingredients regulated by SARA III: NONE

BASF

The Chemical Company

Safety data sheet
HDO® 1,6-Hexanediol molten

1. Substance/preparation and company identification

Company
BASF Corporation
100 Campus Drive
Florham Park, NJ 07932

24 Hour Emergency Response Information
CHEMTREC: (800) 424-9300
BASF HOTLINE: (800) 832-HELP

Molecular formula:	C(6)H(14)O(2)
Chemical family:	diols
Synonyms:	1,6 Hexanediol

2. Composition/information on ingredients

CAS Number	Content (W/W)	Chemical name
629-11-8	> 96.0 %	hexane-1,6-diol

3. Hazard identification

Emergency overview

CAUTION: MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
INGESTION MAY CAUSE GASTRIC DISTURBANCES.
Use with local exhaust ventilation.
Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.
Wear NIOSH-certified chemical goggles.
Wear protective clothing.
Wear a NIOSH-certified (or equivalent) particulate respirator.
Eye wash fountains and safety showers must be easily accessible.

Potential health effects

Primary routes of exposure
Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

Acute toxicity:
Information on: Hexanediol (1,6-)

1,6-hexanediol has been known to cause disequilibrium, atonia, and anorexia in experimental animals given high acute gavage doses. Repeated gavage doses in experimental animals has been known to produce liver effects.

Wear appropriate respiratory protection. Use personal protective clothing. Ensure adequate ventilation.

Environmental precautions:
This product is not regulated by RCRA. This product is not regulated by CERCLA ('Superfund').

Cleanup:
Spills should be contained and placed in suitable containers for disposal.

7. Handling and storage

Handling

General advice:
Avoid contact with skin and eyes. Ensure adequate ventilation.

Protection against fire and explosion:
Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy. Avoid whirling up the material/product because of the danger of dust explosion.

Storage

General advice:
Keep container dry.

8. Exposure controls and personal protection

Personal protective equipment

Respiratory protection:
Wear a NIOSH-certified (or equivalent) particulate respirator. Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination.

Hand protection:
Chemical resistant protective gloves, nitrile rubber (Buna N), chloroprene rubber (Neoprene), polyvinyl alcohol, Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:
Tightly fitting safety goggles (chemical goggles).

General safety and hygiene measures:
Eye wash fountains and safety showers must be easily accessible. Wear protective clothing as necessary to minimize contact.

9. Physical and chemical properties

Form:	Molten mass or solid
Odour:	odourless
Colour:	colourless

Chronic toxicity

Other information:
No experimental evidence available for genotoxicity in vitro (Ames test negative).

12. Ecological information

Environmental fate and transport

Biodegradation:

Test method:	DIN 38409 Part 51
Method of analysis:	BOD of COD
Degree of elimination:	> 60 %
Test method:	OECD 301 A (new version)
Method of analysis:	DOC reduction
Degree of elimination:	> 90 %
Evaluation:	Easily eliminated from water. Readily biodegradable.

Chemical oxygen demand (COD):
2,190 mg/g

Biochemical oxygen demand (BOD):
Incubation period 5 d: 1,320 mg/g

Adsorbable organically-bound halogen (AOX):

This product contains no organically-bound halogen.
Acute and prolonged toxicity to fish:
golden orfe/LC50 (96 h): > 460 - < 1,000 mg/l

Acute toxicity to aquatic invertebrates:
Daphnia magna/EC50 (48 h): > 500 mg/l

Toxicity to aquatic plants:
green algae/EC50 (72 h): 2,200 mg/l

13. Disposal considerations

Waste disposal of substance:
Incinerate in a licensed facility.
Do not discharge substance/product into sewer system.

Container disposal:
Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

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is a registered trademark of BASF Mexicana or BASF AG
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END OF DATA SHEET

General Chemical

MATERIAL SAFETY DATA SHEET
Sodium Nitrite

INGESTION: May irritate mouth, esophagus and stomach. Although small quantities are used in food preparation, swallowing moderate amounts of sodium nitrite can result in serious toxic effects including death. Effects include nausea, weakness, cyanosis (blue skin), collapse and coma, possibly leading to death. Sodium nitrite interferes with the blood's ability to transport oxygen.

DELAYED EFFECTS: Sodium nitrite has no known delayed effects. (If sodium nitrite is used with amines found in certain cutting fluids, potentially carcinogenic nitrosamine compounds may be formed.)

Ingredients found on one of the three OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section.			

4. FIRST AID MEASURES

SKIN: Wash with plenty of soap and water to remove all product residues. Remove contaminated clothing and wash before reuse.

EYES: Immediately flush with running water continuing for 15 minutes. If irritation persists, consult a physician.

INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration, preferably mouth to mouth. If breathing is difficult, oxygen should be administered, provided a qualified operator is present. Get immediate medical assistance for any symptom.

INGESTION: If conscious, give victim 2 to 4 glasses of water and induce vomiting by touching finger to back of throat. Continue until vomited fluid is clear. Get immediate medical assistance.

ADVICE TO PHYSICIAN: Sodium nitrite forms methemoglobin in the blood stream. Treat accordingly.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:
Use flooding amounts of water or other agents. DO NOT use dry chemicals containing ammonium phosphate.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Material does not burn but is an oxidizing agent and will support combustion of other materials. Product decomposes above 608°F releasing toxic nitrogen oxides.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
No ingredients listed in this section.			

[1] = Limit established by General Chemical Corporation.
[2] = Workplace Environmental Exposure Level (AIHA).
[3] = Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:
None.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	White to slightly yellow crystals
PHYSICAL STATE:	Solid
MOLECULAR WEIGHT:	69.0
CHEMICAL FORMULA:	$NaNO_2$
ODOR:	None
SPECIFIC GRAVITY (water = 1.0):	2.17
SOLUBILITY IN WATER (weight %):	46% at 68°F
pH:	Approximately 9 (for aqueous solution)
BOILING POINT:	Decomposes above 608°F
MELTING POINT:	520°F
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (air = 1.0):	Not applicable
EVAPORATION RATE:	Not applicable COMPARED TO: Not applicable
% VOLATILES:	Not applicable
FLASH POINT:	Not flammable

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):
Normally stable.

INCOMPATIBILITIES:
Hazardous reactions can occur with acids, ammonium compounds, reducing agents (particularly cyanides, thiocyanates and thiosulfates). May ignite organic compounds and other combustible materials.

HAZARDOUS DECOMPOSITION PRODUCTS:
Oxides of nitrogen (toxic and irritating).

HAZARDOUS POLYMERIZATION:
Will not occur.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Listed on TSCA Inventory of Chemical Substances

OTHER TSCA ISSUES: Requires export notification (Section 12b) Subject to SNUR if used in metalworking fluids (40CFR721.4740).

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
Sodium nitrite	100	none

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate

SARA 313 TOXIC CHEMICALS:
The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirments. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
Sodium nitrite	none

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section.		

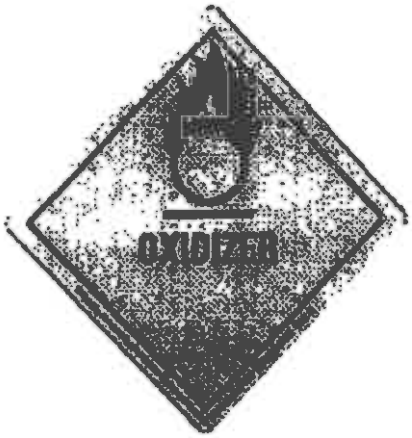
ADDITIONAL REGULATORY INFORMATION:
None

WHMIS CLASSIFICATION (CANADA):
C, D1B, D2B

FOREIGN CHEMICAL CONTROL INVENTORY STATUS:
Listed on Canadian DSL and EU's EINECS (EINECS #: 231-555-9)

16. OTHER INFORMATION

CURRENT ISSUE DATE: June, 1999



Storage Statement: Storage Temperature: This product may be stored under all ambient temperatures up to 170° F

FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:

Suitable:	Use extinguishing media suitable for fire.
Not Suitable:	Not applicable
Special Fire Fighting Procedures:	Wear protective equipment and self contained breathing apparatus.
Unusual Fire/Explosion Hazards:	Not applicable
Protection Of Firefighters:	Standard

Hazardous Thermal Decomposition Products: Sulphur Dioxide, carbon monoxide, carbon dioxide

ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:	Avoid contact with skin.
ENVIRONMENTAL PRECAUTIONS:	Not applicable
METHOD OF CLEANING UP:	Flush spill with water.

HANDLING AND STORAGE

HANDLING:	None.
STORAGE:	General storage.
SUITABLE PACKING MATERIALS:	HMHDPE woven bags / paper bags or fiber drums. Keep container tightly closed.
NOT SUITABLE PACKING MATERIALS:	Not applicable

EXPOSURE CONTROLS/PERSONAL PROTECTION

TLV/STEL (USA)
MAK (GERMANY)

RESPIRATORY SYSTEM PROTECTION:	None required when adequate ventilation available. If airborne concentration is high, use a mask or respirator.
SKIN AND BODY PROTECTION:	Uniform and apron
HAND PROTECTION:	Rubber gloves
EYE PROTECTION:	Safety goggles

STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Heat, flame and other sources of ignition.
MATERIALS TO AVOID:	Do not subject to acidic pH / moisture strong acids and oxidizing agents.
HAZARDOUS DECOMP PROD:	Do not subject to acidic pH / moisture strong acids and oxidizing agents.

TRANSPORT INFORMATION

UN NUMBER:	Not applicable
LANDROAD / RAILWAY:	
ADR / RID CLASS:	Chemicals N. O. S. (non regulated)
ADR / RID ITEM #:	Chemicals N. O. S. (non regulated)
INLAND WATERWAYS:	
ADNR CLASS:	Chemicals N. O. S. (non regulated)
SEA:	
IMDG CLASS:	Chemicals N. O. S. (non regulated)
IMDG PAGE #:	Chemicals N. O. S. (non regulated)
AIR:	
IATA-DGR CLASS:	Chemicals N. O. S. (non regulated)

NATIONAL TRANSPORT REGULATIONS:

REGULATORY INFORMATION

EC – REGULATIONS:	Not available
EC CLASSIFICATION:	Not available
LABEL NAME:	Sodium Lauryl Sulfate
HAZARD SYMBOLS:	Not applicable
RISK PHRASES:	Not applicable
SAFETY PHRASES:	Not applicable

Fire and Explosion Hazards	Very slightly to slightly flammable in presence of open flames, sparks and heat. Not considered to present risks of explosion under normal handling and use.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Firefighters and others who may be exposed to products of combustion should wear full firefighting turn out gear and self-contained breathing apparatus. Firefighting equipment should be thoroughly decontaminated after use.

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Precautions	Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin and clothing.
Storage	Store and use away from heat, sparks, open flame, or any other ignition source. Ground all metal containers during storage. Limit indoor storage to areas equipped with appropriate automatic sprinkler systems.

Engineering Controls	Investigate engineering techniques to reduce exposures. Provide ventilation if necessary to minimize exposure. If practical use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.
Personal Protection	Safety glasses. Gloves. Dust respirator.
Personal Protection in Case of a Large Spill	Safety glasses. Dust respirator. Gloves. Boots. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	None established.

Physical State & Appearance	Solid. (Crystals/granules.)	Odor	Odorless
Molecular Weight	144.11	Taste	Sweetish, astringent.
pH (1% soln/water)	8	Color	White.
Boiling Point	Not available.		
Melting Point	300°C (572°F)		
Critical Temperature	Not available		
Specific Gravity	1.44		
Vapor Pressure	0 mm of Hg (@ 20°C). Does not form vapor.		
Vapor Density	Not available.		
Volatility	Not available.		
Odor Threshold	Not available.		
Evaporation Rate	Not available.		
Viscosity	Not available.		
Log Octanol/Water Partitition Coeff.	Not available.		
Ionicity (In Water)	Not available.		
Dispersion Properties	See solubility in water, methanol.		
Solubility	Easily soluble in cold water, hot water. Partially soluble in methanol.		

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with Various Substances	Highly reactive with oxidizing agents. Hygroscopic (absorbs moisture from the air). Incompatible with acids and ferric salts.
Corrosivity	Not considered to be corrosive for metals and glass according to our database.
Hazardous Polymerization	Not available.
Hazardous Decomposition Products	Not available.

Other Regulations	EUROPEAN REGULATIONS
	EINECS: This product in on the European Inventory of Existing Commercial Chemical Substances (EINECS): ID number 208-534-8
	EU: Council Directive No. 95/2/EC on Food Additives other than colors and sweetners: Listed as E No. E211 in Annex III (conditionally permitted preservatives and antioxidants Part A)
	OECD: This substance is on the Organization for Economic Cooperation and Development (OECD) Working List (Sublist) of High Production Volume Chemicals.
	Germany: Ordinance on Classification of Water-Endangering Substances. This substance has been assigned WGK Class: 1 (Slightly water endangering): WGK Identification Number: None; Assigned by Verband Chemischer Industry (VCI).
	Switzerland: Federal Health Agency, Giftliste 1 (Stoffe), Ausgabe 1995 [Toxics list 1 (1995)]. Toxicity Category: 4; Identification Number: G-2572.
	NORTH AMERICAN REGULATIONS
	United States: TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory; [CASRN 532-32-1].
	United States: OSHA Hazard Communication Standard (29 CFR 1910.1200) classification: This product is not regulated as a hazardous substance.
	United States: Food and Drug Administration (FDA) Approvals: 21 CFR 184.1733 (Direct Food Substances Generally Recognized As Safe) Maximum Use level 0.1%. 21 CFR 582.3733 (General Purpose Food Additives) Maximum Use level 0.1% Animal food
	United States: Flavor and Extract Manufactures' Association (FEMA) Generally Recognized As Safe (GRAS) listing. FEMA number 3025.21
	Canada: This product is on the Canadian Environmental Protection Act (CEPA) Domestic Substances List (DSL); [CASRN 532.32.1].
	Canada: WHMIS classification; Not listed or regulated as a hazardous substance.
	PACIFIC RIM REGULATIONS
	Australia: This substance is on the Australian Inventory of Chemical Substances (AICS): [CASRN 532.32.1].
	China: This substance is on the DRAFT Chinese Inventory of Chemical Substances. ID#: I
	Japan: This substance is on the MITI/MHW Chemical Substance Control Law inventory of Existing and New Chemical Substances (ENCS); ENCS # (3)-1272, ENCS # (3)-1293.
	Japan: This substance is not known to be on the MOL Industrial Safety and Health Law (ISHL) List of Existing Chemical Substances.
	Philippines: This substance is on the DRAFT Philippines Inventory of Chemicals and Chemical Substances (PICCS). CASRN: 532.32.1
	South Korea: This substance is on the Korean Existing Chemicals List (ECL); ID Number 3-1076.

TETRASOD PYROPHOS TECH GR
56301

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Ashland P.O. Box 2219 Columbus, OH 43216	Regulatory Information Number Telephone Emergency telephone number	1-800-325-3751 614-790-3333 1-800-ASHLAND (1-800-274-5263)

Product name	TETRASOD PYROPHOS TECH GR
Product code	56301
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: solid, white

Moderate skin irritant, Moderate eye irritant.

Potential Health Effects

Routes of Exposure

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye Contact

Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin Contact

May cause mild skin irritation. Symptoms may include redness and burning of skin. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Ingestion

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation

This material is a dust or may produce dust. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to Physician

Hazards: Excessive levels of phosphorus can cause low blood calcium, with tetany and convulsions.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Water mist, carbon dioxide (CO2), dry chemical

Hazardous Combustion Products

May form:, phosphorous oxides, sodium oxide

Precautions for Fire-Fighting

No special fire hazards are known to be associated with this product. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

No data

Environmental Precautions

No data

If needed, use a NIOSH-approved dust respirator. (Ask your safety representative.)

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	solid
Form	No data
Colour	white
Odour	No data
Boiling point/range	No data
pH	No data
Flash point	No data
Evaporation rate	No data
Explosion limits	No data
Vapour pressure	No data
Vapour density	No data
Density	No data
	No data
Solubility	No data
Partition coefficient (n-octanol/water)	No data
Autoignition temperature	No data

10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to Avoid

Avoid contact with:, moisture

Incompatible Products

Avoid contact with strong mineral acids and strong organic acids., Avoid contact with:

Hazardous Decomposition Products

May form:, phosphorous oxides, sodium oxide

Hazardous Reactions

Product will not undergo hazardous polymerization.

Dangerous goods descriptions may not reflect package size, quantity, end-use or region-specific exceptions that can be applied to shipments. Consult shipping documents for material-specific descriptions.

15. REGULATORY INFORMATION

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

SARA Hazard Classification Acute Health Hazard

SARA 313 Component(s)

OSHA Hazards Moderate skin irritant
Moderate eye irritant

	Health	Flammability	Reactivity	Other
HMIS	1	1	0	
NFPA	1	0	0	

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

Substance	CAS	EINECS No	%w/w	Risk Phrase
Tetrasodium Pyrophosphate	7722-88-5	231-767-1	95+	R36/37/38

3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

EC Classification Xi - Irritant
Safety phrase S26 S36

Human Health Effects

The product causes eye irritation and may cause respiratory tract irritation.

Environmental Effects

This material is not expected to produce any significant environmental effects when recommended use instructions are followed.

4. FIRST-AID MEASURES

WARNING STATEMENTS
CAUTION!
CAUSES EYE IRRITATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

General

Treatment is symptomatic and supportive. This product causes eye irritation and may cause respiratory tract irritation. Eye irritation symptoms include stinging, tearing, redness and swelling. Inhalation of this dust may cause coughing, chest pain, runny nose and burning throat. Ingestion of large doses (e.g. 20 g) may cause vomiting and nausea. If vomiting is not spontaneous, do NOT induce it Phosphates are laxatives.

Eye contact

Immediately flush eyes with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

Skin contact

Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

Inhalation

Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Inhalation of the dust may cause coughing, runny nose, and sneezing.

Ingestion

Rinse mouth with plenty of water. Dilute by drinking 1 to 2 glasses of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious

Store is cool, dry place to maintain product performance.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limit

State	Standard	Limit
Australia	Occupation Exposure Limit	5 mg/m3 8-hr. TWA
Belgium	Occupation Exposure Limit	5 mg/m3 8-hr. TWA
Denmark	Occupation Exposure Limit	5 mg/m3 8-hr. TWA
Finland	Occupation Exposure Limit	5 mg/m3 8-hr. TWA, 3 mg/m3
France	Occupation Exposure Limit	VME 5 mg/m3
Norway	Occupation Exposure Limit	5 mg/m3 8-hr. TWA
Switzerland	Occupation Exposure Limit	MAK week 5 mg/m3
United Kingdom	Occupation Exposure Limit	5 mg/m3 8-hr TWA
United States	Occupation Exposure Limit	5 mg/m3 8-hr. TWA

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment; a dust and vapor respirator is recommended by HMIS. Use approved respiratory protective equipment as described in the U.S. OSHA 29 CFR 1910.134 or European Standard EN149.

Hand/skin protection

Wearing protective clothes is recommended; protective gloves and synthetic apron is recommended by HMIS. Wash hand and contaminated skin thoroughly after handling this product.

Eye protection

Wear appropriate protective eyeglasses or chemical safety goggles as described in the U.S. OSHA 29 CFR 1910.133 or European Standard EN 166. Splash goggles are recommended by HMIS.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Chemical Formula:	Na4 P207
Form	powder, free flowing
Color	White
Odor	Odorless

Important health, safety and environmental information

pH (1% solution)	10.3
Water solubility:	6.4 (g/10042 H20) @ 25 deg C
Melting point:	Incongruently @ 622 deg C, completely @ 985 deg C
Bulk density:	0.88 (g/cc)

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.

Conditions to avoid

Excessive moisture.

by the U.S. Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be land filled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

Road/Rail, Sea and Air

IMDG/UN	Not classified
ICAO/IATA	Not classified
RID/ADR	Unknown
Canadian TDG	Not classified
U.S. DOT	Not classified

15. REGULATORY INFORMATION

EC label

Hazard symbol:	Xi - Irritant
Risk phrase	R36/37/38 irritating to eyes, respiratory system and skin.
Safety phrase	S26 In case of contact with eyes, immediately flush with plenty of water and seek medical attention S36 Wear suitable protective clothing

Chemical Inventory

USA TSCA:	Listed
Canada DSL:	Listed
EC:	Listed
Japan	Listed
Australia	Listed
Korea	Listed
Philippines	Listed
China	Listed

Additional information

WHMIS Classification: D2(B) Materials causing other toxic effects

SARA Hazard Notification	
Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	None
Section 313 Toxic Chemical(s):	None
CERCLA Reportable Quantity:	Not applicable

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

16. OTHER INFORMATION

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	3	0	0	
Suggested HMIS Rating	3	0	0	J

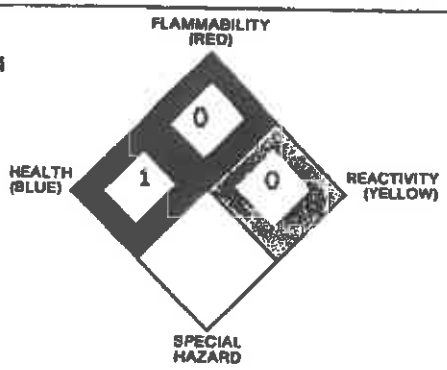
J = Splash goggles, gloves, synthetic apron, dust & vapor respirator

FMC

MATERIAL SAFETY DATA 7722 88 5

TETRASODIUM PYROPHOSPHATE

NFPA Designation 704



DEGREE OF HAZARD
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNFICANT

EMERGENCY TELEPHONES:
PLANTS: (307) 875-2580 GREEN RIVER, WY
(913) 749-8100 LAWRENCE, KS

CHEMTREC: (800) 424-9300 TRANSPORTATION
MEDICAL: (303) 595-9048 ROCKY MTN

REVISION: 07 EFFECTIVE: 02/07/91 PRINTED: 01/04/93

PREPARED FOR USE BY.....	RHEOX CORPORATION
==========	IDENTIFICATION ==========
INFORMATION PROVIDED BY..:	FMC CORPORATION 1735 MARKET STREET PHILADELPHIA PA 19103
==========	PRODUCT INFORMATION ==========
SYNONYMS.....:	SODIUM PYROPHOSPHATE, TETRASODIUM DIPHOSPHATE, TSPP
SHIPPING NAME - DOT.....:	NONE, NOT REGULATED
IATA.....:	NONE, NOT REGULATED
IMDG.....:	NONE, NOT REGULATED
FORMULA.....:	NA4P2O7
CHEMICAL FAMILY.....:	PHOSPHATE
PRODUCT USES.....:	DETERGENTS, CLAY DISPERSANTS, OIL WELL DRILLING MUDS, WATER TREATMENT, TEXTILE PROCESSING, BLEACH BATH STABILIZER, DISPERSANT AND COAGULANT IN FOOD SYSTEMS, MOISTURE RETENTION IN MEAT, ETC.
==========	PRECAUTIONARY INFORMATION ==========
PRECAUTIONARY STATEMENT..: (PLEASE USE THIS STATEMENT TO SATISFY THE IN-PLANT LABELING REQUIREMENTS OF THE OSHA HAZARD COMMUNICATIONS STANDARD 29CFR 1910.1200)	HEALTH: AIRBORNE DUST IS IRRITATING TO NOSE AND THROAT. DIRECT CONTACT WITH EYES MAY PRODUCE IRRITATION. FIRST AID: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. WASH SKIN WITH WATER. HANDLING: USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION AND CHEMICAL GOGGLES IF AIRBORNE DUST IS EXPECTED.
==========	INGREDIENTS ==========
CAS# AND COMPONENT.....:	MATERIAL OR COMPONENT: TETRASODIUM PYROPHOSPHATE PERCENT : 100 CAS # : 7722-88-5
CANADIAN PRODUCT IDENTIFICATION NUMBER....:	2811

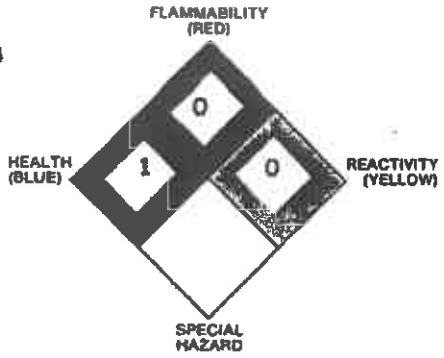
PCD

FMC

MATERIAL SAFETY DATA 7722 88 5

TETRASODIUM PYROPHOSPHATE

NFPA Designation 704



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FIRE, EXPLOSION AND REACTIVITY DATA

SENSITIVITY TO MECH IMPACT: NONE

SENSITIVITY TO STATIC DISCHARGE: NONE

ROUTES OF EXPOSURE

EYE CONTACT: EXTREMELY IRRITATING TO UNWASHED EYES AND MINIMALLY IRRITATING TO WASHED EYES. RABBITS WITH UNWASHED EYES SHOWED PERSISTING OCULAR DAMAGE ON DAY 22, THE LAST DAY OF THE STUDY. WASHING THE EYES SHORTLY AFTER EXPOSURE DECREASED THE DURATION AND SEVERITY OF THE IRRITATION. WASHED EYES RETURNED TO NORMAL BY DAY 3.
SOURCE: FMC REPORT I86-0916

SKIN CONTACT: NONIRRITATING AT 500 MG/KG (RABBIT)
SOURCE: FMC REPORT I88-1008
DATE: 1988

SKIN ABSORPTION: PRACTICALLY NONTOXIC, LD50 > 2000 MG/KG (RABBIT)
SOURCE: FMC REPORT I88-1009 (1988)

INHALATION: DUST MAY BE IRRITATING
ACGIH (1986) TLV = 5 MG/CU M

INGESTION: SLIGHTLY TOXIC LD 50 = 4000 MG/KG (RAT)
SOURCE: RTEC DATE: 1980

EXPOSURE LIMITS

TLV = 5 MG/CU.M	ACGIH	1985-86
PEL = 5 MG/CU.M 8 HR TWA	OSHA	1989

EFFECTS OF OVEREXPOSURE

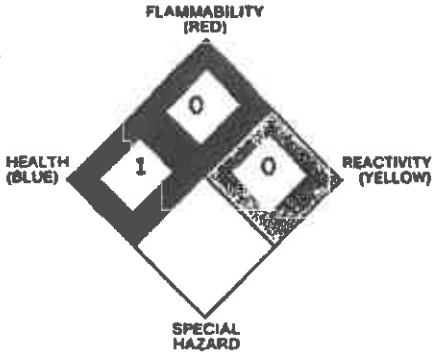
ACUTE EXPOSURE: EXTREME EYE IRRITANT. NONIRRITATING TO SKIN. LOW ORAL AND DERMAL TOXICITY.

FMC

MATERIAL SAFETY DATA 7722 88 5

TETRASODIUM PYROPHOSPHATE

NFPA Designation 704



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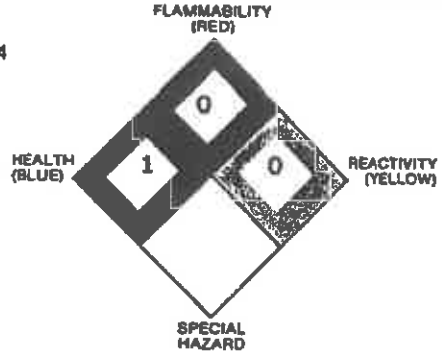
==========	SPECIAL PROTECTION ==========
RESPIRATORY.....:	USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION, IF AIRBORNE DUST IS EXPECTED.
EYES.....:	WEAR CHEMICAL GOGGLES, IF AIRBORNE DUST IS EXPECTED.
GLOVES.....:	NO SPECIAL REQUIREMENT.
SPECIAL CLOTHING AND EQUIPMENT..:	NO SPECIAL REQUIREMENT.
FOOTWEAR.....:	NO SPECIAL REQUIREMENT.
==========	STORAGE AND HANDLING ==========
(PLEASE USE THIS STATEMENT TO SATISTY THE IN-PLANT LABELING REQUIREMENTS OF THE OSHA HAZARD COMMUNICATIONS STANDARD 29CFR 1910.1200)	USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION AND CHEMICAL GOGGLES, IF AIRBORNE DUST IS EXPECTED.
	STORE IN DRY AREA, FOR PRODUCT QUALITY ASSURANCE.
==========	DISPOSAL, SPILL OR LEAK PROCEDURES ==========
PROCEDURE FOR RELEASE OR SPILL....:	MATERIAL SHOULD BE SWEPT UP FOR SALVAGE OR DISPOSAL.
WASTE DISPOSAL METHOD....:	IF MATERIAL CAN NOT BE SALVAGED, A METHOD OF DISPOSAL IS IN A LANDFILL IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
==========	TRANSPORTATION DATA ==========
DOT PROPER SHIPPING NAME.:	NONE, NOT REGULATED
DOT CLASSIFICATION.....:	NOT REGULATED
DOT LABELS.....:	NOT REQUIRED
DOT MARKING.....:	NOT REQUIRED
DOT PLACARD.....:	NOT REQUIRED

PCD

FMC

TETRASODIUM PYROPHOSPHATE

NFPA Designation 704



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REVISION: 07 EFFECTIVE: 02/07/91 PRINTED: 01/04/93

========== ADDITIONAL INFORMATION ==========

AQUATIC TOXICITY DATA (FOR TKPP)
96 HR LC50 > 100 MG/L, NON-TOXIC (MYSID SHRIMP, MENIDIA, RAINBOW TROUT)
FMC STUDIES I89-1089, I89-1090 & I89-1091
48 HR EC50 > 100 MG/L, NON-TOXIC (DAPHNIA).
FMC STUDY I89-1092

CHEMICAL NAME Tetrasodium pyrophosphate

SECTION VI – TOXICOLOGY (Product)

ACUTE ORAL LD 50 4.0 g/kg (rat)	CARCINOGENIC Not known to be carcinogenic
ACUTE DERMAL LD 50 Not known	MUTAGENIC Not known to be mutagenic
ACUTE INHALATION LC 50 Not known	EYE IRRITATION Irritant
	PRIMARY SKIN IRRITATION May be an irritant

PRINCIPAL ROUTES OF ABSORPTION
Oral.

EFFECTS OF ACUTE EXPOSURE Nausea, vomiting, dairrhea, eye and mucous membrane irritation. May cause skin irritation.

EFFECTS OF CHRONIC EXPOSURE
None expected at industrial use levels.

SECTION VII – SPILL OR LEAKAGE PROCEDURES (Control Procedures)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear goggles, coveralls and impervious gloves and boots. If material is in powdered form, wear NIOSH/MSHA approved dust respirator. Follow OSHA regulations for respirator use. (See 29 CFR 1910.134). Shovel or sweep up and place in an approved DOT container and seal. Flush any residual material with water.

In the event of a massive spill, use the emergency phone number shown on the front of this sheet.

WASTE DISPOSAL METHOD

Dispose of unused and contaminated product in a manner approved for this material. Consult appropriate Federal, State and Local regulatory agencies to ascertain proper disposal procedures.

SECTION VIII – REACTIVITY DATA

STABLE X UNSTABLE AT ____ °C ____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR
		WILL NOT OCCUR X

CONDITIONS TO AVOID

INCOMPATABILITY (Material To Avoid) None

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION IX – PHYSICAL DATA

MELTING POINT 1610°F	VAPOR PRESSURE NA	VOLATILES None
BOILING POINT	SOLUBILITY IN WATER 6% @ 75°F	EVAPORATION RATE NA
SPECIFIC GRAVITY (H_2O =1) 2.5	pH of 1% aq soln = 10.2	VAPOR DENSITY (Air = 1) NA

INFORMATION FURNISHED BY: C. J. Michaels DATE 3/19/80

Department of Environmental Hygiene and Toxicology
Olin CORPORATION
120 Long Ridge Road, Stamford, Connecticut 06904
EMERGENCY PHONE (203) 356 - 2345

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Brown green spheres

Odorless

Flash Point: Not Applicable

Contains SUSPECT CANCER HAZARD - Risk of cancer depends on route, duration and level of exposure.

Prolonged or repeated exposure may cause damage to the lungs, liver, kidneys, and may cause blood disorders.

Causes eye, skin and respiratory tract irritation.
May cause allergic skin and respiratory reaction.
Harmful if swallowed. May cause nausea, vomiting, diarrhea, coma, convulsions and death.
Not a fire or explosion hazard. However, toxic emissions are possible in a fire situation.

ROUTES OF ENTRY

Eyes? YES Skin? YES Inhalation? YES Ingestion? YES

POTENTIAL HEALTH EFFECTS

EYE CONTACT causes irritation and possible corneal injury.

SKIN CONTACT causes irritation and may cause itching. Sensitization and allergic reactions are possible. Absorption of large amounts through damaged skin may lead to systemic toxicity.

INHALATION causes irritation of the respiratory tract and possibly symptoms similar to that of the common cold. May also cause allergic respiratory reactions. Prolonged or excessive exposure may result in COPPER poisoning.

INGESTION is harmful. May cause abdominal pain, cramps, nausea, vomiting, diarrhea and weakness. Systemic toxicity may result in convulsions, shock, coma and death.

CARCINOGENICITY

NTP? YES IARC? YES OSHA? NO

Certain CHROMIUM +6 compounds have been listed as suspect human carcinogens by both the National Toxicology Program (NTP) and the International Agency for Research on Cancer IARC - Group 1), and as confirmed human carcinogens (A1) by the American Conference of Governmental Industrial Hygienists (ACGIH). There is insufficient evidence on the carcinogenicity of CHROMIUM and CHROMIUM +3 compounds.
This product contains both CHROMIUM +3 and CHROMIUM +6 compounds.

HMIS HAZARD CLASSIFICATION

Health: 2* Flammable: 0 Reactivity: 0 Special: C

*Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information.

EXTINGUISHING MEDIA

Use water, carbon dioxide or foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Not a fire or explosion hazard. However, toxic emissions are possible in a fire situation.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Contain spillage and scoop up or vacuum. Avoid dusting. Notification of the National Response Center (800/424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

It is recommended that each user establish a spill prevention, control and countermeasure plan (SPCC). Such plan should include procedures applicable to proper storage, control and clean up of spills, including reuse or disposal as appropriate (see Section 13: Disposal Considerations).

NOTE In the event of an accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

Wash thoroughly after handling.
Keep storage container closed.
Store in a cool, dry location away from incompatible materials.
Avoid generating or breathing dust.
Avoid contact with eyes, skin and clothing.
Use only with adequate ventilation.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Brown green spheres
Odor: Odorless
Boiling Point: Not Applicable
Specific Gravity (H2O=1): 0.9 g/cc (Bulk Density)
Melting Point: Not Applicable
Vapor Pressure (mm Hg): Not Applicable
Vapor Density (Air=1): Not Applicable
Evaporation Rate: Not Applicable
% Solubility In Water: Slightly Soluble
pH: Not Applicable

SECTION 10: STABILITY AND REACTIVITY

Stability: Generally considered stable.
Avoid: High temperatures.

INCOMPATIBILITY (Materials to Avoid)

Strong oxidizers, ammonia and bases.

Acids and reducing agents.

May undergo an exothermic hydration reaction with water.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS

Thermal decomposition will produce metal oxides fumes.

Polymerization: Polymerization is not expected to occur.
Avoid: Not applicable.

SECTION 11: TOXICOLOGICAL INFORMATION

CHEMICAL NAME	% Wt. LD50	LC50
ALUMINA CAS NO.: 1344-28-1	80-90 Not Available	Not Available
CHROMIUM (3+) OXIDE CAS NO.: 1308-38-9	8-12 Not Available	Not Available
CHROMIUM (6+) TRIOXIDE CAS NO.: 1333-82-0	0-3 80 mg/kg RAT, oral	Not Available
COPPER OXIDE CAS NO.: 1317-38-0	1-3 Not Available	Not Available

NOTE: See Sections 3, 8 and 12 for additional information.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES

IMMEDIATE (Acute) Health Hazard: YES
DELAYED (Chronic) Health Hazard: YES
FIRE Hazard: NO
REACTIVITY Hazard: NO
Sudden Release of PRESSURE: NO

SARA SECTION 313 NOTIFICATION

This product contains a toxic chemical (or chemicals) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHEMICAL NAME	CAS Number	% Wt.
CHROMIUM (3+) OXIDE	1308-38-9	8-12
CHROMIUM (6+) TRIOXIDE	1333-82-0	0-3
COPPER OXIDE	1317-38-0	1-3

OZONE DEPLETING SUBSTANCES (ODS)

This product neither contains nor is manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments 1990 and 40 CFR Part 82.

VOLATILE ORGANIC COMPOUNDS (VOC)

Not Applicable

US STATE REGULATIONS

CALIFORNIA: The State of California has a regulation (Proposition 65), which identifies specific chemicals known to the State of California to cause cancer or birth defects. Proposition 65 requires a disclosure for products sold within the State of California containing an identified chemical. The following information is required by the State of California for this product:

*WARNING: This product contains chemicals known to the State of California to cause cancer.

VOLATILE ORGANIC COMPOUND (CARB): Not Applicable

199 Pomeroy Road
Parsippany, NJ 07054
phone 973-599-4400
fax 973-428-6048

MATERIAL SAFETY DATA SHEET

Product: ECON-ABATOR® LCO CATALYST

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Common Name:	CHROME-COPPER ALUMINA CATALYST
Chemical Name:	CHEMICAL MIXTURE
Formula:	CHEMICAL MIXTURE
Product CAS No.:	CHEMICAL MIXTURE
Product Use:	Industrial catalyst

Supplier: AirPol, Inc.
199 Pomeroy Road
Parsippany, NJ 07054
973-599-4400

FOR CHEMICAL EMERGENCY CALL CHEMTREC (24 HOURS):
1-800-424-9300 (US, Canada, Puerto Rico, Virgin Islands)
1-703-527-3887 (Outside Above Area)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT:	CAS NO.	% Wt.
ALUMINA	1344-28-1	80-90
CHROMIUM (3+) OXIDE	1308-38-9	8-12
CHROMIUM (6+) TRIOXIDE	1333-82-0	0-3
COPPER OXIDE	1317-38-0	1-3

INGREDIENT NOTES

NOTE: The percentage by weight values reported above for the ingredients in this product represent typical formulation values.

NOTE: See Section 8 for Exposure Limits and Section 11 for Toxicological Information.

CHRONIC HEALTH HAZARDS

Overexposure may lead to COPPER poisoning, resulting in hemolytic anemia and liver, kidney and spleen damage.

Prolonged or repeated exposure to CHROMATES may cause damage to the lungs, liver, kidneys, and may cause blood disorders.

Refer to Potential Health Effects and Carcinogenicity.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

May adversely affect existing medical conditions, such as eye, skin, respiratory, blood, liver and/or kidney ailments.

May aggravate existing heart or cardiovascular disorders.

Individuals with Wilson's disease are at increased risk of COPPER poisoning.

NOTE: See Section 8 for Exposure Limits, Section 11 for Toxicological Information and Section 12 for Ecological Information.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician or poison center.

SKIN CONTACT: Immediately wash skin with soap and plenty of water. If irritation persists, call a physician or poison center.

INHALATION: Remove to fresh air. If breathing is difficult, qualified personnel should administer oxygen. Call a physician or poison center.

INGESTION: Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

SECTION 5: FIRE-FIGHTING MEASURES

Flash Point:	Not Applicable
Auto-Ignition:	Not Applicable
LEL:	Not Applicable
UEL:	Not Applicable

NFPA HAZARD CLASSIFICATION

Health: 2 Flammable: 0 Reactivity: 0

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS INGREDIENT	PEL-OSHA	TLV-ACGIH
ALUMINA CAS NO.: 1344-28-1	10 mg/m3 (Total dust) 5 mg/m3 (Respirable dust)	10 mg/m3 (as Al, dust)
CHROMIUM (3+) OXIDE CAS NO.: 1308-38-9	1 mg/m3 (as Cr)	0.5 mg/m3 (as Cr)
CHROMIUM (6+) TRIOXIDE CAS NO.: 1333-82-0	0.1 mg/m3 (as CrO3) Ceiling	0.05 as mg/m3 (as Cr)
COPPER OXIDE CAS NO.: 1317-38-0	1 mg/m3 (as Cu)	1 mg/m3 (as Cu)

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only). All ACGIH TLVs refer to the 2000 Standards. Unless otherwise noted, all OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989.

RESPIRATORY PROTECTION

A NIOSH/MSHA approved dust respirator is recommended if dust is generated. If respiratory protection is used, follow all requirements for respiratory programs set forth in OSHA regulations (29 CFR 1910.139).

VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT

Safety glasses (with side shields).
Appropriate chemical resistant gloves should be worn.
Body protection as necessary to prevent skin contact.

PERSONNEL SAMPLING PROCEDURE

For HEXAVALENT CHROMIUM: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Methods 7600, 7604, 9101. For CHROMIUM: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7024.
For COPPER (dust & fume): Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7029.
For NUISANCE DUST: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, and Method 0500.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY

No data available.

ENVIRONMENTAL FATE

No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

US EPA Waste Number: D007

This product, if disposed of by itself, is a hazardous waste under the EPA hazardous waste regulations because of extractable CHROMIUM. Waste mixtures containing this product should be tested for Toxicity Characteristics (TC) using the current Toxicity Characteristic Leaching Procedure (TCLP).

Federal, state and local disposal laws and regulations will determine the proper waste disposal/recycling/reclamation procedure. Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected. Refer to 40 CFR Part 261 et al. for details.

NOTE Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/re-claimed in accordance with federal, state, and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

INTERNATIONAL
UN Number: Not Regulated

UNITED STATES

EPA Waste Number: D007
DOT Classification: Not Regulated

CANADA
PIN Number: Not Regulated
TDG Class: Not Regulated

EC
DGL: Not Determined

CANADIAN REGULATIONS

DSL/NDSL: DSL
WHMIS Classification: Class D Division 1 Subdivision B
Class D Division 2 Subdivision A
Class D Division 2 Subdivision B

EUROPEAN REGULATIONS

EINECS: Yes

OTHER REGULATIONS

MITI (Japan): Yes AICS (Australia): Yes

SECTION 16: OTHER INFORMATION

REVISIONS

November 10, 2004
Revision Number: 2

PREPARATION INFORMATION

Prepared By: AirPol, Inc. Phone Number: See Section 1

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling this product. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section 1 to make certain that this sheet is current. End of MSDS..

MATERIAL SAFETY DATA SHEET INDEX
RAW MATERIALS - CLAY
PLANT

Attagel (R) (All) Attagel 50 / Attagel 20
Attagel ™ 50
Attapulgite Clay
Hectorite Crude
National Bentonite
Min-U-Gel and Florigel

Scan all these
MSDSs + label pdf
"MSDSs Raw Materials Clay"

Tan powder or particles

Odorless

Flash Point: Nonflammable

Contains Suspect Cancer Hazard (Attapulgite contains naturally occurring crystalline silica). However, in reviewing this material, IARC has determined that there is inadequate evidence of carcinogenicity to humans and experimental animals (Group 3).
May cause mechanical irritation to eyes and skin.
Prolonged or repeated inhalation of dust may cause a disabling, progressive pulmonary fibrosis.
This product is not a fire or explosion hazard.

ROUTES OF ENTRY

Eyes? NO Skin? NO Inhalation? YES Ingestion? NO

POTENTIAL HEALTH EFFECTS

EYE CONTACT may cause mechanical irritation if exposed to large amounts of dust.

SKIN CONTACT may cause irritation.

INHALATION may cause irritation to respiratory tract and lung damage if exposure is repeated or prolonged.

INGESTION: No adverse effects expected.

CARCINOGENICITY

NTP? YES IARC? NO OSHA? NO

In evaluating a naturally occurring clay component of this product, the International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence of carcinogenicity to humans and experimental animals (Group 3). However, this component, like other naturally occurring minerals, contains crystalline silica. Crystalline silica has been classified by the National Toxicology Program (NTP) as reasonably anticipated to be carcinogenic. Inhaled quartz or cristobalite have been classified by IARC as carcinogenic to humans (Group 1).

CHRONIC HEALTH HAZARDS

NIOSH has studied the exposure effects of a clay component of this product, which contains crystalline silica, on pulmonary function and has determined that there is no evidence of significant respiratory morbidity. However, crystalline silica (quartz) by itself may cause disabling, progressive pulmonary fibrosis (silicosis) characterized by coughing, dyspnea, wheezing and impairment of pulmonary function.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

May aggravate pre-existing medical conditions, such as asthma and inflammatory or fibrotic lung disease.

NOTE: See Section 8 for Exposure Limits, Section 11 for Toxicological Information and Section 12 for Ecological Information.

SECTION 4: FIRST AID MEASURES

Keep container closed.
Avoid breakage of bagged material or spills of bulk material.
Use dustless systems for handling, storage, and clean up so that airborne dust does not exceed the PEL. Use adequate ventilation and dust collection. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment.
Maintain, clean, and fit test respirators in accordance with OSHA regulations. Maintain and test ventilation and dust collection equipment. Wash or vacuum clothing which has become dusty.
We recommend that smoking be prohibited in all areas where respirators must be used.
See also American Society for Testing and Materials (ASTM) standard practice E 1132-86, "Standard Practice for Health Requirements Relating to Occupational Exposure to Quartz Dust."

Avoid breathing dust.

Avoid contact with eyes.

Use only with adequate ventilation.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS INGREDIENT	PEL-OSHA	TLV-ACGIH
MAGNESIUM ALUMINUM SILICATE* CAS NO.: 12174-11-7	15 mg/m3 (Total dust) 5 mg/m3 (Respirable dust)	10 mg/m3 (Inhalable particulate) 3 mg/m3 (Respirable particulate)
MAGNESIUM OXIDE CAS NO.: 1309-48-4	10 mg/m3 (Fume, total dust) 5 mg/m3 (Fume, respirable fraction)	10 mg/m3 (Fume)
SILICA, CRYSTALLINE (QUARTZ) CAS NO.: 14808-60-7	0.1 mg/m3 (Respirable dust)	0.05 mg/m3 (Respirable fraction)

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only). All ACGIH TLVs refer to the 1999 Standards. All OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989.

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved respirator as necessary.

VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT

Safety glasses (with side shields).

PERSONNEL SAMPLING PROCEDURE

SECTION 13: DISPOSAL CONSIDERATIONS

US EPA Waste Number: Not Regulated

This product, if disposed as received, is a non-hazardous waste on the basis of TCLP testing under current EPA Hazardous Waste Regulation as defined by 40 CFR Part 261 et al. Disposal/recycling/reclamation requirements will vary by location and type of disposal selected. Consult with state and local regulatory authorities.

NOTE Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

INTERNATIONAL
UN Number: Not Regulated

UNITED STATES

EPA Waste Number: Not Regulated
DOT Classification: Not Regulated

CANADA
PIN Number: Not Regulated
TDG Class: Not Regulated

EC
DGL: Not Determined

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES

IMMEDIATE (Acute) Health Hazard: NO
DELAYED (Chronic) Health Hazard: YES
FIRE Hazard: NO
REACTIVITY Hazard: NO
Sudden Release of PRESSURE: NO

SARA SECTION 313 NOTIFICATION

This product does not contain toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

OZONE DEPLETING SUBSTANCES (ODS)

This product neither contains nor is manufactured with an ozone depleting substance subject to the labelling requirements of the Clean

ENGELHARD

20 → $0.131
30 → 0.180
50 → 0.360

ATTAGEL™ 50

Typical Properties

Property	Typical Value
Average Particle Size, microns	0.1
Residue, + 325 mesh (wet, wt %)	0.01 % maximum
Oil Absorption (ASTM D281)	115
Free Moisture, as produced (wt % @ 220°F)	12 %
Volatile matter, as produced (wt % @ 1200°F, moisture-free basis)	10 %
Bulking Value (lbs./gal.) (gr/liter)	19.70 2360
pH (ASTM D1208)	7.5 - 9.5
Color	Light Cream
Specific Gravity	2.36
Tamped Bulk Density (lbs./ft³) (kgs./m³)	19 - 22 300 - 350
B.E.T. surface area, m²/gm (moisture-free basis)	150

rev. 2/95

...rmation and data regarding the composition, properties, or use of the products described herein is ...ved to be reliable. However, no representation or warranty is made with respect thereto except as made by Engelhard in writing at the time of sale. Engelhard Corporation cannot assume responsibility for any patent liability which may arise from the use of any product in a process, manner or formula not designed by Engelhard.
EC-3283-4

ENGELHARD CORPORATION
SPECIALTY MINERALS AND COLORS GROUP
101 WOOD AVENUE
ISELIN, NEW JERSEY 08830-0770 U.S.A.
TELEPHONE: (908) 205-5000

INGREDIENT NOTES

*Naturally occurring chemical substance per TSCA, 40 CFR 710.4(b).

NOTE: See Section 8 for Exposure Limits and Section 11 for Toxicological Information.

[redacted]

EMERGENCY OVERVIEW

Tan powder or particles

Odorless

Flash Point: Nonflammable

May cause mechanical irritation to eyes.
Prolonged or repeated inhalation of dust may cause a disabling, progressive pulmonary fibrosis.
This product is not a fire or explosion hazard.

ROUTES OF ENTRY

Eyes? NO Skin? NO Inhalation? YES Ingestion? NO

POTENTIAL HEALTH EFFECTS

EYE CONTACT may cause mechanical irritation if exposed to large amounts of dust.

SKIN CONTACT may cause irritation.

INHALATION may cause irritation to respiratory tract and lung damage if exposure is repeated or prolonged.

INGESTION: No adverse effects expected.

CARCINOGENICITY

NTP? NO IARC? NO OSHA? NO

In evaluating naturally occurring ATTAPULGITE, the International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence of carcinogenicity to humans and limited evidence of carcinogenicity to experimental animals (Group 3). However, Attapulgite, like other naturally occurring minerals, contains crystalline silica. Crystalline silica has been classified by both the National Toxicology Program (NTP) and IARC as having sufficient evidence of carcinogenicity

NFPA HAZARD CLASSIFICATION

Health: 0 Flammable: 0 Reactivity: 0

HMIS HAZARD CLASSIFICATION

Health: 1* Flammable: 0 Reactivity: 0

* Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information.

EXTINGUISHING MEDIA

Product will not burn. Use appropriate extinguishing media to extinguish combustible materials stored near-by.

SPECIAL FIRE FIGHTING PROCEDURES

Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS

This product is not a fire or explosion hazard.

[redacted]

Contain spillage and scoop up or vacuum. Do not use a cleaning method that will generate dust.

NOTE In the event of an accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

[redacted]

Wash thoroughly after handling.
Keep container closed.
Avoid breakage of bagged material or spills of bulk material.
Use dustless systems for handling, storage, and clean up so that airborne dust does not exceed the PEL. Use adequate ventilation and dust collection. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain, clean, and fit test respirators in accordance with OSHA

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved respirator as necessary.

VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT

Safety glasses (with side shields).

PERSONNEL SAMPLING PROCEDURE

For CRYSTALLINE SILICA: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Methods 7500, 7601 and 7602.
For NUISANCE DUST: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 0500.
For RESPIRABLE DUST: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 0600.

[redacted]

Appearance: Tan powder or particles
Odor: Odorless
Boiling Point: Not Applicable
Specific Gravity (H_2O=1): > 1.0
Melting Point: Not Applicable
Vapor Pressure (mm Hg): Not Applicable
Vapor Density (Air=1): Not Applicable
Evaporation Rate: Not Applicable
% Solubility In Water: Insoluble
pH: Not Determined

[redacted]

Stability: Generally considered stable.
Avoid: Not applicable.

INCOMPATIBILITY (Materials to Avoid)

None expected.

NOTE Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

SECTION 14 - TRANSPORT INFORMATION

INTERNATIONAL
UN Number: Not Regulated

UNITED STATES

EPA Waste Number: Not Regulated
DOT Classification: Not Regulated

CANADA
PIN Number: Not Regulated
TDG Class: Not Regulated

EC
DGL: Not Regulated

SECTION 15 - REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES

IMMEDIATE (Acute) Health Hazard: NO
DELAYED (Chronic) Health Hazard: YES
FIRE Hazard: NO
REACTIVITY Hazard: NO
Sudden Release of PRESSURE: NO

SARA SECTION 313 NOTIFICATION

This product does not contain toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and

SECTION 11: TOXICOLOGICAL INFORMATION
SECTION 15: REGULATORY INFORMATION
LABEL COPY

PREPARATION INFORMATION

Prepared By: Corporate Environment, Health & Safety Group
Phone Number: See Section 1

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling this product. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section I to make certain that this sheet is current. Copyright Engelhard Corporation. License granted to make unlimited copies for internal use only. End of MSDS.....

INGREDIENT NOTES

*Naturally occurring chemical substance per TSCA, 40 CFR 710.4(b).

NOTE: See Section 8 for Exposure Limits and Section 11 for Toxicological Information.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Tan powder or particles

Odorless

Flash Point: Nonflammable

Contains Suspect Cancer Hazard (Attapulgite contains naturally occurring crystalline silica). However, in reviewing this material, IARC has determined that there is inadequate evidence of carcinogenicity to humans and limited evidence of carcinogenicity to experimental animals (Group 3).
May cause mechanical irritation to eyes and skin.
Prolonged or repeated inhalation of dust may cause a disabling, progressive pulmonary fibrosis.
This product is not a fire or explosion hazard.

ROUTES OF ENTRY

Eyes? NO Skin? NO Inhalation? YES Ingestion? NO

POTENTIAL HEALTH EFFECTS

EYE CONTACT may cause mechanical irritation if exposed to large amounts of dust.

SKIN CONTACT may cause irritation.

INHALATION may cause irritation to respiratory tract and lung damage if exposure is repeated or prolonged.

INGESTION: No adverse effects expected.

CARCINOGENICITY

NTP? YES IARC? NO OSHA? NO

In evaluating a naturally occurring clay component of this product, the International Agency for Research on Cancer (IARC) has determined that

UEL: Not Applicable

NFPA HAZARD CLASSIFICATION

Health: 0 Flammable: 0 Reactivity: 0

HMIS HAZARD CLASSIFICATION

Health: 1* Flammable: 0 Reactivity: 0

* Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information.

EXTINGUISHING MEDIA

Product will not burn. Use appropriate extinguishing media to extinguish combustible materials stored near-by.

SPECIAL FIRE FIGHTING PROCEDURES

Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS

This product is not a fire or explosion hazard.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Contain spillage and scoop up or vacuum. Do not use a cleaning method that will generate dust.

NOTE In the event of an accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

Wash thoroughly after handling.
Keep container closed.
Avoid breakage of bagged material or spills of bulk material.
Use dustless systems for handling, storage, and clean up so that airborne dust does not exceed the PEL. Use adequate ventilation and dust collection. Practice good housekeeping. Do not permit dust to

VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT

Safety glasses (with side shields).

PERSONNEL SAMPLING PROCEDURE

For CRYSTALLINE SILICA: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Methods 7500, 7601 and 7602.
For NUISANCE DUST: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 0500.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Tan powder or particles
Odor: Odorless
Boiling Point: Not Applicable
Specific Gravity (H_2O=1): > 1.0
Melting Point: Not Applicable
Vapor Pressure (mm Hg): Not Applicable
Vapor Density (Air=1): Not Applicable
Evaporation Rate: Not Applicable
% Solubility In Water: Insoluble
pH: Not Determined

SECTION 10: STABILITY AND REACTIVITY

Stability: Generally considered stable.
Avoid: Not applicable.

INCOMPATIBILITY (Materials to Avoid)

None expected.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS

No hazardous decomposition or by-products are expected.

Polymerization: Polymerization will not occur.
Avoid: Not applicable.

claimed in accordance with federal, state, and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

INTERNATIONAL
UN Number: Not Regulated

UNITED STATES

EPA Waste Number: Not Regulated
DOT Classification: Not Regulated

CANADA
PIN Number: Not Regulated
TDG Class: Not Regulated

EC
DGL: Not Determined

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES

IMMEDIATE (Acute) Health Hazard: NO
DELAYED (Chronic) Health Hazard: YES
FIRE Hazard: NO
REACTIVITY Hazard: NO
Sudden Release of PRESSURE: NO

SARA SECTION 313 NOTIFICATION

This product does not contain toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

OZONE DEPLETING SUBSTANCES (ODS)

This product neither contains nor is manufactured with an ozone depleting substance subject to the labelling requirements of the Clean

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling this product. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section I to make certain that this sheet is current. Copyright Engelhard Corporation. License granted to make unlimited copies for internal use only. End of MSDS.....

Elementis Specialties
P.O. Box 700
Hightstown, NJ 08520
Customer Service: (800) 866-6800

Emergency Telephone No's.
CHEMTREC: (800) 424-9300
Elementis Specialties: (609) 443-2800

HECTORITE CRUDE	Approval Date: August 25, 2000 Supersedes: July 1, 1998

6. ACCIDENTAL RELEASE MEASURES

Minimize dusting. Caution: May cause a slippery condition when wet.
Sweep/shovel up and transfer into a drum for re-use or disposal.

PERSONAL PROTECTIVE EQUIPMENT

Wear an air-purifying dust respirator and chemical resistant gloves.
Wear eye protection to prevent dust from entering the eyes.

7. HANDLING AND STORAGE

HANDLING

Avoid high dust concentrations while handling through the use of ventilation or other suitable controls.

STORAGE

None.

8. EXPOSURE CONTROL INFORMATION

OCCUPATIONAL EXPOSURE LIMITS

	ACGIH - TLV	OSHA - PEL
Particulates not otherwise classified:	8 hr. TWA - 10 mg/m³, inhalable 8 hr. TWA - 3 mg/m³, respirable	8 hr. TWA - 10 mg/m³, total 8 hr. TWA - 5 mg/m³, respirable
Quartz:	8 hr. TWA - 0.1 mg/m³, respirable	8 hr. TWA - 0.1 mg/m³, respirable

ENGINEERING CONTROL MEASURES

Use local exhaust ventilation if airborne concentrations are above recommended exposure limits.

PERSONAL PROTECTION EQUIPMENT

Respiratory:	Use an air-purifying dust respirator if airborne concentration levels are above exposure limits.
Hand:	Use gloves.
Eye:	Use safety glasses/goggles.
Other:	None.

OTHER CONTROL MEASURES

Use good hygiene practices. Wash hands and face before eating or drinking.

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SAFETY DATA SHEET

ELEMENTIS SPECIALTIES

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ENVIRONMENTAL/DISPOSAL CONSIDERATIONS

12. ENVIRONMENTAL HAZARDS

None known.

13. DISPOSAL CONSIDERATIONS

Dispose of in a manner in accordance with local and federal regulations. Use a licensed waste handler.

14. TRANSPORTATION

Shipping Name: Not regulated.		Label: N.A.
Hazard Class: N.A.	Packing Group: N.A.	UN#: N.A.

15. REGULATORY INFORMATION

CHEMICAL INVENTORIES In compliance denotes that all components are on the inventory or exempt.

U.S. TSCA Inventory: On the inventory Canadian DSL: On the DSL

SARA 313 Information

None known.

OTHER REGULATORY INFORMATION

Canada / WHMIS Controlled Product: Contains > 0.1% Crystalline Silica.
California Proposition 65 - Crystalline Silica is listed as "Known to the State to Cause Cancer".

16. OTHER INFORMATION

H.M.I.S. CODES Health: 2 Flammability: 0 Reactivity: 0

N.A.: Not Applicable

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4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	All standard firefighting media.
Special Exposure Hazards	Not applicable.
Special Protective Equipment for Fire-Fighters	Not applicable.
NFPA Ratings:	Health 0, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Inhalation	Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A). Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).
Skin Contact	May cause mechanical skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	None known
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
Chronic Effects/Carcinogenicity	Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis. Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2). There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.
Other Information	For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Chronic Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	The California Proposition 65 regulations apply to this product.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.
Disclaimer Statement	This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

END OF MSDS

B. Potential Health Effects:

Acute Eye:
Crystalline silica (quartz) may cause abrasion of the cornea

Acute Skin:
Not anticipated under normal use conditions.

Acute Inhalation:
Prolonged exposure to Magnesium Alumino Silicate may cause delayed (chronic) lung injury (silicosis) due to the presence of respirable crystalline silica. Silicosis is a form of disabling pulmonary fibrosis, which can be progressive and may lead to death.

Acute Ingestion:
Not anticipated under normal use conditions. In the event of ingestion of this product, contact a poison control center or other emergency service and obtain the appropriate medical attention.

Chronic effects:
The adverse health effects from crystalline silica exposure - silicosis, cancer, scleroderma, tuberculosis, and nephrotoxicity - are chronic effects

IV. First Aid Measures

First Aid Measures for Accidental:

Eye Exposure:
Immediately flush eyes with plenty of water for 15 minutes. Get medical attention, if irritation persists.

Skin Exposure:
Remove contaminated clothing as needed and launder before reuse. Wash skin thoroughly with mild soap/water. Get medical attention if irritation develops or persists.

Inhalation:
Remove to fresh air. If breathing has stopped, administer artificial respiration and supply oxygen. Seek medical attention.

Ingestion:
If a significant quantity (> 5 ml) is ingested, seek medical advice. Note: Magnesium Alumino Silicate is an active ingredient in some over-the-counter anti-diarrhea treatments. Ingestion of too much Magnesium Alumino Silicate can result in the excess absorption of fluids in the gastro-intestinal tract and can cause severe blockage.

V. Fire Fighting Measures

Fire Hazard Data:

Flash Point:	NA
Autoignition:	NA
Method Used:	NA

The following chart specifies the types of respirators which may provide respiratory protection for dust containing crystalline silica (quartz).

CONDITION Particulate Concentration	MINIMUM RESPIRATORY PROTECTION* *Use only NIOSH-approved equipment. See 42 CFR §84
5 x PEL or less	Any particulate respirator.
10 x PEL or less	Any particulate respirator, except single-use or quarter-mask respirator. Any fume respirator or high efficiency particulate filter respirator. Any supplied-air respirator. Any self-contained breathing apparatus.
50 x PEL or less	A high efficiency particulate filter respirator with a full face piece. Any supplied-air respirator with a full face piece, helmet, or hood. Any self-contained breathing apparatus with a full face piece.
500 x PEL or less	A powered air-purifying respirator with a high efficiency particulate filter. A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous -flow mode.
Greater than 500 x PEL or entry and escape from unknown concentrations.	Self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode. A combination respirator which includes a Type C supplied-air respirator with a full face piece operated in pressure-demand or other positive pressure continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

Eye / Face Protection:
Wear safety glasses with side shields or goggles.

Skin Protection:
Wear chemical resistant gloves and protective clothing to minimize skin contact. Wash thoroughly after handling.

In the event that this product is used as a component in a polymeric formulation used to mold, cast, form or in any other manner to produce a finished part which may require machining or other finishing procedure, dust may be generated which may contain free crystalline silica. Observe all safety precautions as listed above.

IX. Physical and Chemical Properties

Physical Appearance: Tan or Grey powder

Odor: None

pH: 9.0

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

Accelerated silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and progression is more rapid.

Acute silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

CANCER

The International Agency for Research on Cancer (IARC) concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans* (Group 1)". The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, Silica, Some Silicates (1997).

The National Toxicology Program (NTP), in its *Ninth Annual Report on Carcinogens*, concluded that silica, crystalline (respirable) is "known to be a carcinogen, based on sufficient evidence in experimental animals and in humans."

The U.S. Occupational Safety and Health Administration (OSHA) does not regulate crystalline silica (quartz) as a carcinogen.

There is substantial literature on the issues of the carcinogenicity of crystalline silica, which the reader should consult for additional information. A summary of the literature is set forth in *Exposure to Crystalline Silica & Risk of Lung Cancer: The Epidemiological Evidence*, Thorax, Volume 51, pp. 97-102 (1996). The official statement of the American Thoracic Society on the issue of silica carcinogenicity was published in *Adverse Effects of Crystalline Silica Exposure*, American Journal of Respiratory and Critical Care Medicine, Vol. 155, pp. 761-765 (1997). The official statement concluded that "The available data support the conclusion that silicosis produces increased risk for bronchogenic carcinoma. The cancer risk may also be increased by smoking and other carcinogens in the workplace. Epidemiologic studies provide convincing evidence for increased cancer risk among tobacco smokers with silicosis. Less information is

XIV. Transportation Information

Shipping Name:

ADR/RID/IMO/ICAO /US DOT	Proper Shipping Name	Not Regulated
	Hazard Class	Not Regulated
	ID Number	Not Regulated
	Packaging Group	Not Regulated
	Label Statement	Not Regulated

XV. Regulatory Information

U.S. Federal Regulations:

TSCA Inventory Status:
Listed on Inventory: Yes

RCRA Haz. Waste No.: NA

SARA Title III:
Section 302 No
SARA Title III Hazard Classes:
Fire Hazard: N
Reactive Hazard: N
Release of Pressure: N
Acute Health Hazard: N
Chronic Health Hazard: Y

U.S. State Regulations:

The components identified with an X are present on the respective state's Right To Know lists:

Component	MA	PA	MN	NJ	CA	MI
Hydrous Alumino Silicate						
Crystalline Silica as quartz	X	X		X	X	

California Prop 65 List: Crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen

XVI. Other Information

National Fire Protection Association Hazard Ratings – NFPA(R):

Health Hazard: 0
Flammability: 0
Reactivity: 0

MATERIAL SAFETY DATA SHEET INDEX
PRODUCTION SUPPLIES
PLANT

Carbon Dioxide, Liquid
Ion Exchange Resin, USF C-381
Amberlite ® 200C Resin
Sodium Carbonate (Soda Ash)
Behenic Acid
Sulfamic Acid
Quartz Gravel

Scan all these
MSDSs + label pdf.
as MSDSs. MSDSs Supp[illegible].

rapid breathing and heart rate, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

Skin Contact. No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

Swallowing. An unlikely route of exposure. This product is a gas at normal temperature and pressure.

Eye Contact. No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

Effects of Repeated (Chronic) Overexposure. No harm expected.

Other Effects of Overexposure. Damage to retinal or ganglion cells and central nervous system may occur.

Medical Conditions Aggravated by Overexposure. The toxicology and the physical and chemical properties of carbon dioxide suggest that overexposure is unlikely to aggravate existing medical conditions.

CARCINOGENICITY: Carbon dioxide is not listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None known. For further information, see section 12, Ecological Information.

3. Composition/information on ingredients

This section covers materials of manufacture only. See sections 8, 10, 11, and 16 for information on by-products generated during use in welding and cutting. See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Carbon dioxide	124-38-9	>99%*

**The symbol > means "greater than."*

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: For exposure to cold vapor or solid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: For exposure to cold vapor or solid, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

the floor of an enclosed space, displacing air and pushing it upward. This creates an oxygen-deficient atmosphere near the floor. Ventilate space before entry. Verify sufficient oxygen concentration. Close cylinder valve after each use; keep closed even when empty. ***Prevent reverse flow.*** Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. ***Do not strike an arc on the cylinder.*** The defect produced by an arc burn could lead to cylinder rupture. Do not ground the cylinder or allow it to become part of an electrical circuit. ***Firmly secure cylinders upright to keep them from falling or being knocked over.*** Screw valve protection cap firmly in place by hand. ***Store full and empty cylinders separately.*** Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

RECOMMENDED PUBLICATIONS: For further information on storage, handling, and use, see Praxair publications P-14-153, *Guidelines for Handling Gas Cylinders and Containers;* P-15-073, *Safety Precautions for Carbon Dioxide;* and P-3499, *Safety Precautions and Emergency Response Planning.* Obtain from your local supplier.

8. Exposure Controls/Personal Protection

See section 16 for important information on by-products generated during use in welding and cutting.

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2007)
Carbon dioxide	5,000 ppm	5,000 ppm, 30,000 ppm 15 min STEL

TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

IDLH = 40,000 ppm

ENGINEERING CONTROLS:

Local Exhaust. Use a local exhaust system, if necessary, to keep the concentration of carbon dioxide below all applicable exposure limits in the worker's breathing zone.

Mechanical (General). Under certain conditions, general exhaust ventilation may be acceptable to keep carbon dioxide below the exposure limits.

Special. None

Other. None

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Wear insulated neoprene gloves for cylinder handling; welding gloves for welding. Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. See section 16 for requirements when using carbon dioxide or carbon dioxide mixtures in welding and cutting. Regardless of protective equipment, never touch live electrical parts.

Eye/Face Protection. Select in accordance with OSHA 29 CFR 1910.133. See section 16 for requirements when using carbon dioxide or carbon dioxide mixtures in welding and cutting.

Respiratory Protection. None required under normal use. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

11. Toxicological Information

ACUTE DOSE EFFECTS: LC_{Lo} = 90,000 ppm, 5 min., human

The welding process may generate hazardous fumes and gases. (See sections 10 and 16.)

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECT:	CONCENTRATION:
Breathing rate increases slightly.	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	4 - 5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5 - 10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	10 - 100%

REPRODUCTIVE EFFECTS: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

12. Ecological Information

ECOTOXICITY: No known effects.

OTHER ADVERSE EFFECTS: No adverse ecological effects expected. Carbon dioxide does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Carbon dioxide is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Carbon dioxide is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Carbon dioxide is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Carbon dioxide is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

ADDITIONAL SAFETY AND HEALTH HAZARDS: Using carbon dioxide or mixtures containing carbon dioxide in welding and cutting may create additional hazards.

Read and understand the manufacturer's instructions and the precautionary labels on the products used in welding and cutting. Ask your welding products supplier for a copy of Praxair's free safety booklets, P-2035, *Precautions and Safe Practices for Gas Welding, Cutting, and Heating*, and P-52-529, *Precautions and Safe Practices for Electric Welding and Cutting*, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society (AWS), or see OSHA's Web site at *http://www.osha-slc.gov/SLTC/weldingcuttingbrazing/*. Order AWS documents from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5710, *http://global.ihs.com/*.

FUMES AND GASES can be dangerous to your health and may cause serious lung disease.

- **Keep your head out of fumes. Do not breathe fumes and gases. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness; nausea; and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort.**

Fumes and gases cannot be classified simply. The amount and type depend on the metal being worked and the process, procedure, equipment, and supplies used. Possible dangerous materials may be found in fluxes, electrodes, and other materials. Get an MSDS for every material you use.

Contaminants in the air may add to the hazard of fumes and gases. One such contaminant, chlorinated hydrocarbon vapors from cleaning and degreasing activities, poses a special risk.

- **Do not use electric arcs in the presence of chlorinated hydrocarbon vapors—highly toxic phosgene may be produced.**

Metal coatings such as paint, plating, or galvanizing may generate harmful fumes when heated. Residues from cleaning materials may also be harmful.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		HMIS RATINGS:	
HEALTH	= 1	HEALTH	= 1
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= SA (CGA recommends this to designate Simple Asphyxiant.)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-320
PIN-INDEXED YOKE:	CGA-940 (medical use)
ULTRA-HIGH-INTEGRITY CONNECTION:	CGA-716

Use the proper CGA connections. DO NOT USE ADAPTERS. Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information can be found in the following materials published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
AV-7	*Characteristics and Safe Handling of Carbon Dioxide*
G-6	*Carbon Dioxide*
G-6.1	*Standard for Low Pressure Carbon Dioxide Systems at Customer Sites*
G-6.2	*Commodity Specification for Carbon Dioxide*
P-1	*Safe Handling of Compressed Gases in Containers*
SB-2	*Oxygen-Deficient Atmospheres*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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SECTION V -- HEALTH HAZARD DATA (CONT'D)

EFFECTS OF OVEREXPOSURE (Cont'd):

Skin Contact: Prolonged contact with carbon dioxide "snow" (solid) could result in cryogenic "burn" or frostbite. Persons in ill health where such illness would be aggravated by exposure to liquid carbon dioxide should not be allowed to work with or handle this product.

EMERGENCY AND FIRST AID PROCEDURE:

If Inhaled: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. If unconscious, provide assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive. Self-contained breathing apparatus should be available for rescue personnel.

Skin Contact: (Frostbite) Flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

SECTION VI -- REACTIVITY DATA

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY (MATERIALS TO AVOID): Reacts with alkaline materials to form carbonates and bicarbonates. Can be explosive with reactive metals (Sodium, Potassium, Magnesium) and their hydrides.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide at high temperatures.

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

SECTION VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Liquid carbon dioxide will not spill, but forms solid "snow" at pressures below 67 psig.

Leaks should be vented to the atmosphere "outside" in a safe area. Follow all federal, state and local regulations.

SECTION VIII -- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: In event of major leak, self-contained breathing apparatus may be required.

VENTILATION: LOCAL EXHAUST (X) To prevent accumulation above the TWA,
MECHANICAL (GENERAL) (X) STEL or PEL.

PROTECTIVE GLOVES: Loose fitting, insulated EYE PROTECTION: Safety goggles or glasses plus transparent full face shield

OTHER PROTECTIVE EQUIPMENT: Safety shoes; portable CO_2 analyzer

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SECTION 3 – HAZARDS IDENTIFICATION (cont.)

Inhalation – Acute Effects: Vapors are unlikely due to physical properties.
Skin Contact – Acute Effects: Prolonged or repeated exposure is not likely to cause significant skin irritation. May cause more severe response if skin is scratched or cut. Skin absorption is unlikely due to physical properties.
Eye Contact – Acute Effects: May cause severe eye irritation. May cause moderate corneal injury. Effects are likely to heal.
Ingestion – Acute Effects: Single dose oral toxicity is considered to be low. No hazards anticipated from swallowing small amounts incidental to normal handling operation.

SECTION 4 – FIRST AID MEASURES

Inhalation First Aid: Remove affected person from area to fresh air and provide oxygen if breathing is difficult. Give artificial respiration ONLY if breathing has stopped and give CPR ONLY if there is no breathing and no pulse. Obtain medical attention. No adverse effects anticipated by this route of exposure.
Skin Contact First Aid: Immediately remove clothing from affected area and wash skin vigorously with flowing water. Clothing should be washed before reuse. DO NOT instruct person to neutralize affected skin area.
Eye Contact First Aid: Immediately irrigate eyes with flowing water continuously for 15 minutes while holding eyes open. Contacts should be removed before or during flushing. Obtain medical attention. DO NOT instruct person to neutralize.
Ingestion First Aid: No adverse effects anticipated by this route of exposure incidental to proper industrial handling. If ingestion does occur, if victim is alert and not convulsing rinse mouth with water and give plenty of water to drink. If spontaneous vomiting occurs, have affected person lean forward with head down to avoid breathing in of vomitus. Rinse mouth again and give more water to drink. Obtain medical attention.
Medical Conditions Aggravated: There are no known conditions aggravated by exposure.
Note to Physician: No specific antidote. Supportive care. Treatment based on judgement of the physician in response to reactions of the patient.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point/Method: Not applicable
Auto Ignition Temperature: Above 500°C (900°F)
Upper/Lower Explosion Limits: Not applicable

Extinguishing Media: Water, carbon dioxide, dry chemical
Fire Fighting Procedures: Keep people away. Isolate fire area and deny unnecessary entry. Cool surrounding area with water to localize fire zone. Soak thoroughly with water to cool and prevent reignition.

SECTION 8 –PERSONAL PROTECTION/ EXPOSURE CONTROL

Respiratory Protection: No respiratory protection should be needed.
Skin Protection: Wear gloves impervious to this material to prevent skin contact.
Eye Protection: Wear protective eyeglasses or chemical safety goggles. Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Ventilation Protection: Good general ventilation should be sufficient.
Other Protection: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.
Safety showers, with quick opening valves which stay open, and eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

Exposure Limits:
Exposure limits have not been developed.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Spherical beads/Odorless to slight amine odor

Vapor Pressure: N/A*	**Vapor Density (Air=1):** N/A
Boiling Point: N/A	**Melting Point:** N/A
Specific Gravity: N/A	**Solubility in Water:** Insoluble
Volatile Percentage: N/A	**pH:** N/A
Flash Point/method: N/A	**Auto Ignition Temperature:** Above 500°C (900°F)
Upper/Lower Explosion Limits: N/A	**Other:** none

*N/A=Not applicable

SECTION 10 – STABILITY AND REACTIVITY

Stability: Stable under normal handling and storage conditions.
Incompatibilities: Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions and could result is slightly degraded resin up to an explosive reaction. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.
Polymerization: Hazardous polymerization cannot occur.
Decomposition: Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials. Hazardous decomposition products may include and are not limited to: aromatic compounds, hydrocarbons, organic sulfonates, sulfur oxides.
Conditions to Avoid: Resin can decompose at temperatures greater than 90°C (194°F). Do not pack column with dry ion exchange resins. Dry beads expand when wet. This expansion can cause a glass column to shatter.

SECTION 15 – REGULATORY INFORMATION

US Regulations:
SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SRA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

TSCA Considerations: Every different salt or ionic form of an ion exchange resin is a separate chemical. If you use an ion exchange resin for ion exchange purposes and then remove the by-product resin from its vessel or container prior to recovery of the original or another form of the resin or of another chemical, the by-product resin must be listed on the TSCA Inventory (Unless an exemption is applicable). It is the responsibility of the customer to ensure that such isolated, recycled by-product resins are in compliance with TSCA. Failure to comply could result in substantial civil or criminal penalties being assessed by the EPA.

State Regulations: Consult individual state agency for further information.

Canadian Regulations:
WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

D2B - eye or skin irritant
Refer elsewhere in the MSDS for specific warnings and safe handling information.

CPR Statement: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

SECTION 16 – OTHER INFORMATION

Disclaimer: The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the user thereof. It is the buyer's responsibility to ensure that its activities comply with federal, state, provincial and local laws.

Created by: MSDS Coordinator

V — REACTIVITY INFORMATION

STABILITY	CONDITIONS TO AVOID
[X] STABLE [ ] UNSTABLE	Temperatures over 200C/392F.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may yield styrene monomer, divinylbenzene, sulfur oxides.

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
[ ] MAY OCCUR [X] WILL NOT OCCUR	None known

INCOMPATIBILITY (MATERIALS TO AVOID): [ ] WATER [X] OTHER — Avoid contact with concentrated nitric acid or any other strong oxidizing agents at all times.

VI — SPILL OR LEAK PROCEDURE INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Floor may be slippery. Use care to avoid falls. Sweep up and transfer to containers for recovery or disposal.

WASTE DISPOSAL METHODS: Unused resin may be incinerated or landfilled in facilities meeting local, state and federal regulations. For contaminated resin, the user must determine the hazard and use an appropriate disposal method.

VII — SPECIAL PROTECTION INFORMATION

VENTILATION TYPE:
Normal room ventilation.

RESPIRATORY PROTECTION:
None required for normal operations.

PROTECTIVE GLOVES	EYE PROTECTION
None required	Safety glasses (ANSI Z87.1 or equivalent)

OTHER PROTECTIVE EQUIPMENT:
Eyewash facility

VIII — STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
MAX. 49C/120F MIN. 0C/32F	YES	NO	NO	YES

Store at ambient conditions. Avoid repeated freeze-thaw cycles.

NOTE: The maximum operating temperature recommended for this product is 150C/300F. Above this temperature functional group destruction and loss of capacity will occur.

IX — TOXICITY INFORMATION

No toxicity data available for this product.

X — MISCELLANEOUS INFORMATION

Caution: Do not pack column with dry ion exchange resins. Dry beads expand when wetted; this expansion can cause a glass column to shatter.

Caution: Nitric acid and other strong oxidizing agents can cause explosive type reactions when mixed with ion exchange resins. Proper design of equipment to prevent rapid build-up of pressure is necessary if use of an oxidizing agent such as nitric acid is contemplated. Before using strong oxidizing agents in contact with ion exchange beads, consult sources knowledgeable in handling these materials.

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	906226-6	01/03/89	08/05/87

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE

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MATERIAL SAFETY DATA

SODIUM CARBONATE

FMC

497 -19 -8

U.S./CANADA VERSION EFFECTIVE: 02/13/97 PRINTED: 03/12/97

==========	4. FIRST AID MEASURES ==========
	CORNEAL OPACITIES AND VESICULAR SKIN REACTIONS IN HUMANS WITH ABRADED SKIN ONLY. TREATMENT IS SYMPTOMATIC AND SUPPORTIVE.
==========	5. FIRE FIGHTING MEASURES ==========
EXTINGUISHING MEDIA.....	WATER, WATER FOG, CARBON DIOXIDE (CO2), DRY CHEMICAL.
SPECIAL FIREFIGHTING PROCEDURES	WEAR FULL PROTECTIVE CLOTHING AND SELF CONTAINED BREATHING APPARATUS.
DEGREE OF FIRE AND EXPLOSION HAZARD	NOT APPLICABLE.
HAZARDOUS DECOMPOSITION PRODUCTS	HEATED TO DECOMPOSITION, IT EMITS FUMES OF SODIUM OXIDE.
==========	6. ACCIDENTAL RELEASE MEASURES ==========
PROCEDURE FOR RELEASE OR SPILL	SWEEP UP AND RECYCLE INTO PROCESS IF CONTAMINATION DOES NOT PRESENT A PROBLEM. USE APPROPRIATE PROTECTIVE EQUIPMENT IF DUST IS GENERATED OR CONTACT WITH EYES OR SKIN IS EXPECTED. FLUSH RESIDUES AND LIQUID TO HOLDING AREA FOR NEUTRALIZATION BEFORE DISCHARGE.
==========	7. HANDLING AND STORAGE ==========
HANDLING.....	USE AIR CONVEYING/MECHANICAL SYSTEMS FOR BULK TRANSFER TO STORAGE. FOR MANUAL HANDLING OF BULK TRANSFER USE MECHANICAL VENTILATION TO REMOVE AIRBORNE DUST FROM RAILCAR, SHIP OR TRUCK. USE APPROVED RESPIRATORY PROTECTION WHEN VENTILATION SYSTEMS ARE NOT AVAILABLE. SELECTION OF RESPIRATORS IS BASED ON THE DUST CLOUD GENERATED.
VENTILATION.....	PROVIDE GENERAL MECHANICAL AND/OR LOCAL EXHAUST VENTILATION TO PREVENT RELEASE OF AIRBORNE DUST INTO THE WORK ENVIRONMENT. APPROVED RESPIRATORY PROTECTION SHOULD BE USED WHEN AIRBORNE DUST IS EXPECTED TO BE RELEASED.
STORAGE.....	STORE IN A COOL DRY AREA, AWAY FROM ACIDS.
==========	8. EXPOSURE CONTROLS/PERSONAL PROTECTION ======
CONTROL MEASURES.....	MINIMIZE EYE AND SKIN CONTACT BY USING APPROPRIATE PROTECTIVE EQUIPMENT. USE LOCAL OR GENERAL ROOM VENTILATION TO CONTROL AIRBORNE DUST THAT MAY BE GENERATED INTO THE WORK ENVIRONMENT.
RECOMMENDED PERSONAL	

(CONTINUED) PAGE 02

MATERIAL SAFETY DATA

SODIUM CARBONATE

FMC

497 -19 -8

U.S./CANADA VERSION EFFECTIVE: 02/13/97 PRINTED: 03/12/97

==========	10. STABILITY AND REACTIVITY ==========
CONTRIBUTE TO INSTABILITY	NONE
INCOMPATIBILITY.....	REACTS WITH ACIDS WITH RELEASE OF LARGE VOLUMES OF CARBON DIOXIDE GAS AND HEAT.
HAZARDOUS DECOMPOSITION.. PRODUCTS	NONE
SENSITIVITY TO MECH..... IMPACT	NONE
SENSITIVITY TO STATIC.... DISCHARGE	NONE
==========	11. TOXICOLOGICAL INFORMATION ==========
EYE CONTACT.....	SEVERE IRRITANT (RABBIT) TOXICOLOGY 23:281-291 (1982)
SKIN CONTACT.....	NON-IRRITATING TO INTACT SKIN. MINOR IRRITATION MAY OCCUR ON ABRADED SKIN. NON-SENSITIZING (HUMANS, 0.25% SODIUM CARBONATE) TOXICOL. APPL. PHARMACOL. 31:481-490 (1975)
SKIN ABSORPTION.....	NO DATA AVAILABLE.
INHALATION.....	LC50 = 2.3 MG/L (RAT,2 HR.) ENVIRON RES 31:138 (1983).
INGESTION.....	LD50 = 4090 MG/KG (RAT) (RTECS 1985-6).
ACUTE EFFECTS FROM..... OVEREXPOSURE	MAY CAUSE SEVERE IRRITATION OF THE EYES, INCLUDING CORNEAL OPACITIES. DUSTS AND MISTS ARE IRRITATING TO THE SKIN, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
CHRONIC EFFECTS FROM..... OVEREXPOSURE (EFFECTS CONSIDERED INCLUDE: SENSITIVITIES, CARCINOGENICITY, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, AND ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.)	MAY CAUSE INFLAMMATION OF THE MUCOUS MEMBRANES IN THE RESPIRATORY TRACT AND OF THE SKIN.
==========	12. ECOLOGICAL INFORMATION ==========
ENVIRONMENTAL FATE.....	BIODEGRADABILITY DOES NOT APPLY TO INORGANIC SUBSTANCES. NO OTHER DATA AVAILABLE.
	96 HR LC50 (BLUEGILL SUNFISH) = 300-320 MG/L

(CONTINUED) PAGE 04

MATERIAL SAFETY DATA

SODIUM CARBONATE

497 -19 -8

U.S./CANADA VERSION EFFECTIVE: 02/13/97 PRINTED: 03/12/97

15. REGULATORY INFORMATION

UNLISTED SUBSTANCE(S)	NOT APPLICABLE
RQ	NOT APPLICABLE
CHARACTERISTIC	NOT APPLICABLE
RCRA WASTE NO.	NOT APPLICABLE
SARA TITLE III SEC 313 (40 CFR 372)	
LISTED TOXIC CHEMICAL	NOT LISTED
INVENTORY REPORTING	
SARA TITLE III SEC 311/312 HAZARD CATEGORY	IMMEDIATE (ACUTE) HEALTH HAZARD (IRRITANT)
PLANNING THRESHOLD	10,000 POUNDS
EMERGENCY PLANNING	
SARA TITLE III SEC 302-303 (40 CFR 355)	
LISTED SUBSTANCE(S)	NOT APPLICABLE
RQ	NOT APPLICABLE
PLANNING THRESHOLD	NOT APPLICABLE
U.S. TSCA STATUS	LISTED
CANADA	
INGREDIENT DISCLOSURE LIST SUBSTANCE(S)	SODIUM CARBONATE
CONTROLLED PRODUCT	YES
HAZARD SYMBOLS	TOXIC
CLASS & DIVISION	CLASS D, DIVISION 2, SUBDIVISION B.
PRODUCT IDENTIFICATION NO	NOT APPLICABLE
DOMESTIC SUBSTANCE LIST	LISTED
CEPA PRIORITY LIST	NOT LISTED
CARCINOGENICITY	
ACGIH APPENDIX A	NOT LISTED
A1 - CONFIRMED HUMAN	NOT LISTED
A1 - SUSPECTED HUMAN	NOT LISTED
IARC GROUP 1 OR 2	NO
LABEL LANGUAGE (US/CANADA)	
HEALTH	DUST MAY CAUSE SEVERE IRRITATION OF EYES AND SLIGHT IRRITATION OF NOSE AND THROAT. REPEATED CONTACT MAY CAUSE REDNESS AND DRY, CRACKED SKIN.
PHYSICAL	NOT APPLICABLE
HANDLING AND STORAGE	DO NOT STORE CLOSE TO ACIDS. WEAR EYE PROTECTION AND APPROVED DUST RESPIRATOR WHEN EXCESSIVE DUST IS PRESENT.
FIRST AID	IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL ATTENTION. FLUSH SKIN WITH WATER.
STATE REGULATIONS	CALIFORNIA PROPOSITION 65: SAFE WATER AND TOXIC ENFORCEMENT ACT OF 1986, THE FOLLOWING CHEMICALS HAVE BEEN DETECTED.

(CONTINUED) PAGE 06

Safety data for behenic acid

General

Synonyms: docosanoic acid
Molecular formula: $C_{22}H_{44}O_2$
CAS No: 112-85-6
EINECS No: 204-010-8

Physical data

Appearance: white to cream crystals or powder
Melting point: 74-78 C
Boiling point:
Vapour density:
Vapour pressure:
Density (g cm^{-3}):
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: insoluble

Stability

Stable. Combustible. Incompatible with bases, oxidizing agents, reducing agents.

Toxicology

Avoid breathing dust. Eye, skin and respiratory irritant. Toxicology not fully investigated.

Risk phrases
R36 R37 R38.

Transport information

Non-hazardous for road, sea and air freight.

Personal protection

Minimize contact.

Safety phrases
S22 S24 S25 S26 S36.

Mfg. by
Kuang Ming Enterprise

aic

American International Chemical, Inc.
17 Strathmore Road, Natick, MA 01760
(800) 238-0001 (508) 655-5805 FAX (508) 655-0927
Web Site: www.aicma.com Email: info@aicma.com

MATERIAL SAFETY DATA SHEET

SULFAMIC ACID

SECTION 1 - CHEMICAL PRODUCT AND COMPANY INFORMATION

American International Chemical, Inc. 17 Strathmore Road Natick, MA 01760	Emergency Number: Chemtrec Information Number: 800-238-0001	800-424-9300 703-527-3887

Date: October 1, 2001

Synonyms: Amidosulfonic Acid

CAS #: 5329-14-6

DOT Hazard Class: Corrosive UN 2967

SECTION 2 - COMPOSITION AND INFORMATION ON INGREDIENTS

Sulfamic Acid 99.5% min.

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Odorless, white granules that are corrosive. Can cause burns and harmful if swallowed or inhaled.

POTENTIAL HEALTH EFFECTS
Eye & Skin: Can cause severe irritation.
Inhalation: Will cause severe irritation to the upper respiratory tract.
Ingestion: Can cause severe burns to the mouth, throat and stomach.

CARCINOGENICITY: Not listed under OSHA, IARC, or NTP.

SECTION 4 - FIRST AID MEASURES

Eye: Flush with plenty of water for at least 15 minutes.
Skin: Wash off with plenty of water. Remove any contaminated clothing.
Inhalation: Remove to the fresh air. Give artificial respiration if necessary.
Ingestion: Dilute with water, milk or Milk of Magnesia. Call a physician.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 209°C or 408°F

Vapor Pressure (MM Hg): Not Applicable

Vapor Density (AIR=1): Not Applicable

Specific Gravity (H20=1): 2.11

Bulk Density: 1.2 - 1.5 g/cc

Percent Volatile by Volume (%): Not Applicable

Melting Point: 205°C or 401°F

Evaporation Rate (Butyl Acetate=1): Not Applicable

Solubility in Water: Appreciable 18% WT @ 20°C and 43% by WT @ 70°C

pH: 1.2 (1% solution)

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under normal temperatures and pressures.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur trioxide, sulfur dioxide, nitrogen and ammonia.

KEEP AWAY FROM: Oxidizers, strong bases, alkalis, nitrates, nitrites, carbonates, sulfides and cyanides.

SECTION 11 - TOXICOLOGICAL INFORMATION

ORAL RAT LD_{50} 3160mg/kg

SECTION 12 - ECOLOGICAL INFORMATION

Not available

SECTION 13 - DISPOSAL CONSIDERATIONS

MATERIAL SAFETY DATA SHEET INDEX
WASTE WATER TREATMENT PLANT

Calsoft LAS-99
ChemTreat FO-620
ChemTreat P-835E
ChemTreat P-845E
ChemTreat P-890L
ChemTreat CT-9004
Citranox
Citric Acid Solution
Dry Alum
Ferric Chloride Solution
Sodium Hypochlorite Solution
Prestochlor Calcium Hypochlorite Granules
Liquid Caustic Soda, 50%
Nalco 8103 Plus
Phosphoric Acid 75-80% By Weight
Polarographic D.O. Probe Electrolyte Solution
Sodium Carbonate, Anhydrous
Sodium Metabisulfite
Sodium Tripolyphosphate Anhydrous
Urea Prill XLT IND

Scan in + label
" MSDS - WWTP "

Product Name: CALSOFT® LAS-99

5. FIRE FIGHTING MEASURES:

FLAMMABLE PROPERTIES: FlashPoint: > 300°C. T.O.C.
HAZARDOUS COMBUSTION PRODUCTS: Product burns to form oxides of carbon (CO, CO_2), sulfur containing hydrocarbons, hydrocarbons and soot.
FIRE FIGHTING INSTRUCTIONS:
Extinguishing Media: Water, foam, CO_2, or dry chemical.
Fire Fighting Procedures: Cool the material with water. It burns only when hot.
Fire & Explosion Hazards: None

USE SELF-CONTAINED BREATHING APPARATUS!

6. ACCIDENTAL RELEASE MEASURES:

CAUTION - MATERIAL IS SLIPPERY ON WET & HARD SURFACES

SMALL SPILL: Steps to be taken in case material is leaked or spilled: Recover all usable material. Soak up balance with sand or dirt. May be neutralized with soda ash, TSP, or bicarbonate of soda.
LARGE SPILL: In case of large spill by truck or rail car, call CHEMTREC 1-800-424-9300.

7. HANDLING AND STORAGE:

HANDLING: Spilled material is slippery on walkways and highways. Foams profusely when hit with a stream of water. See section #8 for personal protection equipment.
STORAGE: Store in iron, stainless steel, or acid resistant Fiberglas tanks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

ENGINEERING CONTROLS: Mechanical ventilation recommended if personnel would be working in a confined space with open containers or in direct exposure to the material.
RESPIRATORY PROTECTION: Avoid breathing vapors as they are irritating (sulfur dioxide). A NIOSH approved acid gas respirator should be used if vapors are unavoidable.
SKIN PROTECTION: Chemical resistant gloves, long sleeved shirt, long trousers, chemical resistant boots.
EYE PROTECTION: Safety glasses or goggles and full face-shield.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Boiling Point:	>572°F (300°C)
Vapor Pressure:	15 mm Hg @ 25°C; 39 mm Hg @ 90°C.
Vapor Density (Air=1)	Not applicable.
% Volatile by Volume:	<0.5
Evaporation Rate:	Unknown
pH of Liquid, Typical:	<2.0
Solubility in Water:	Soluble in all proportions, may gel.
Specific Gravity:	1.06
Liquid Density:	8.8 Lbs/Gal.
Appearance:	Clear to slightly hazy brown liquid.
Odor:	Sharp sulfur dioxide odor.

Product Name: **CALSOFT® LAS-99**

15. REGULATORY INFORMATION (Continued):

FEDERAL EPA (Continued)

CERCLA:

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

Chemical:	CAS#:	Concentration % :	RQ (lbs):
Dodecylbenzene sulfonic acid	27176-87-0	31	1000
Sulfuric Acid	7664-93-9	1.50	1000
Sulfur Dioxide	7446-09-5	0.10	500

****

Sulfuric acid and sulfur dioxide are identified as **EXTREMELY HAZARDOUS SUBSTANCES** under SARA Title III, Section 302.

****

SARA Title III - Sections 313

Sulfuric acid is identified as a **TOXIC CHEMICAL**, but is *not* subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372, because it is in a non-aerosol form.

****

INTERNATIONAL REGULATIONS

Global Status: Canada – DSL; EEC – EINECS; Japan- ENCS; Korean – ECL; Australia – AICS; China- IECSC, listed on all inventories.

****

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65: No substance present.
MASSACHUSETTS Right-To-Know, Substance List (MSL): See CERCLA Information.
NEW JERSEY Right-to-Know: See Section 2.
PENNSYLVANIA Right-To-Know: See CERCLA information.

16. OTHER INFORMATION:

NFPA Ratings: Health (2) = Hazardous, Use breathing apparatus;
Flammability (1) = Must be preheated to burn; Reactivity (0) = Normally stable.
HIMS: H2-F1-R0-PH

This data sheet is for information purposes only and is accurate to best of Pilot Chemical Company's knowledge. The manufacture makes no warranties, expressed or implied, as to the accuracy, completeness, or adequacy of the information contained therein.

Prepared By: B.F. Cruickshank _____ Revised By: B.F. Cruickshank _____

Code Nos.: 4000

Section 5. Fire Fighting Measures

Flammable Properties: Flash point = > 250 F
Suitable Extinguishing Media: Use carbon dioxide, dry chemicals, water fog, or foam.
Fire & Explosion Hazards: None known.
Protective Equipment: If product is involved in a fire, wear full protective clothing including a positive-pressure, NIOSH-approved, self-contained breathing apparatus.

Section 6. Accidental Release Measures

Small Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the material. Wearing appropriate personal protective equipment, move the leaking container to a containment area or plug the leak. Absorb on inert material, then shovel up and dispose of according to local, state, federal regulations.
Large Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the product. Wearing appropriate personal protective equipment, close or cap valves and/or block or plug hold in leaking container and transfer to another container for proper disposal.

Section 7. Handling and Storage

Do not get in eyes, or on skin and clothing. Wash thoroughly after handling. Avoid breathing mists. Do not ingest. Keep away from heat and open flame. Store at ambient temperatures. Keep container securely closed when not in use. Label precautions also apply to empty container. Recondition or dispose of empty containers in accordance with government regulations.

Section 8. Exposure Controls/Personal Protection

Use protective equipment in accordance with 29 CFR 1910 Subpart I. Good general ventilation should be sufficient to control airborne levels. Wear chemical splash goggles or safety glasses with full-face shield. Wear rubber gloves. Wash them after each use and replace as necessary. If conditions warrant, wear impervious protective clothing such as boots, aprons, and coveralls to prevent skin contact. Maintain eyewash fountain and quick-drench facilities in work area.

Section 9. Physical and Chemical Properties

Appearance: Milky straw colored, opaque
Boiling Point: > 212 F
Evaporation Rate: N/D
Freezing Point: 32 F
Melting Point: N/D
Molecular Weight: N/A
Odor: Mild hydrocarbon
pH: N/A
Physical state: Liquid dispersion
Solubility in Water: Insoluble
Specific Gravity: ~ 0.908
Vapor Density: N/D
Vapor Pressure: N/D
Viscosity: N/A
% Volatile: 0

Section 10. Stability and Reactivity

Chemical Stability: Stable at normal temperature and pressure.

ChemTreat, Inc.

MSDS

MATERIAL SAFETY DATA SHEET

Section 1. Chemical Product and Company Identification

Product Name:	**ChemTreat P-835E**
Manufacturer's Name:	ChemTreat, Inc.
Emergency Telephone Number:	(800) 424-9300
Address (Corporate Headquarters)	4461 Cox Road, Glen Allen, VA 23060
Telephone Number for Information:	(800) 648-4579
Date of MSDS:	April 21, 2003

Section 2. Composition/Hazardous Ingredients

Component	CAS Registry #	Wt. %
Petroleum distillate hydrotreated light	64742-47-8	24
Cationic polyacrylamide	Proprietary	40.7

Section 3. Hazards Identification

Emergency Overview: White, viscous, opaque liquid; slight hydrocarbon odor.
Potential Health Effects:
Eyes – Causes minimal eye irritation.
Skin – May be irritating to skin.
Inhalation –May cause irritation of respiratory tract.
Ingestion: May cause nausea.
Chronic Effects/Carcinogenicity: No applicable information was found on the long-term health effects of this product. Persons with pre-existing skin conditions may be more susceptible to the effects of this product. Overexposure to this product may cause irritation and/or burns to the skin.

Section 4. First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.
Eyes: Immediately flush eyes with plenty of water. Get medical attention if irritation persists.
Skin: Wash with soap and water. Get medical attention if irritation develops or persists.
Ingestion: Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammable Properties: Flashpoint = > 200 F
Suitable Extinguishing Media: Use water spray, carbon dioxide, or dry chemical.

Hazardous Decomposition Products: Carbon oxides, nitrogen oxides, and ammonia hydrogen chloride vapor
Hazardous Polymerization: Will not occur

Section 11. Toxicological Information

Petroleum distillate hydrotreated light: Oral LD50 (rat) = > 10 ml/kg; Dermal LD50 (rabbits) = > 10 ml/kg; TLV = 400 ppm OSHA TWA/Ceiling

Section 12. Ecological Information

Fathead Minnow 96h LC50 = 5.815 mg/l; Ceriodaphnia Dubia 48h LC50 = 1.233 mg/l
Sheepshead Minnow 96h LC50 = 117.5 mg/l; Mysid Shrimp 48h LC50 = 33.2 mg/l

Section 13. Disposal Considerations

Dispose of in accordance with federal, state, and local regulations. Does not meet the criteria of a hazardous waste as described in 40 CFR 261.

Section 14. Transport Information (not meant to be all inclusive)

D.O.T. Shipping Name: Not D.O.T. Regulated

Section 15. Regulatory Information (*Not meant to be all inclusive – selected regulation represented)*

TSCA Status: All ingredients listed
CERCLA Reportable Quantity: None
SARA Title III:
Section 302 Extremely Hazardous Substances: None
Section 313 Toxic Chemicals: None
CALIFORNIA PROPOSITION 65: No
KOSHER – This product is certified by the Orthodox Union as kosher pareve. (IA)
NSF – Certified to ANSI/NSF 60. Maximum use rate for potable water – 2 mg/L.

Section 16. Other Information

Hazard (NFPA) Rating: Health 2 Flammability 0 Reactivity 0

SARA Hazard Categories – Section 311/312
Acute – Yes Chronic – No Fire – No Reactive – No Sudden Release – No

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Timothy H. Reid
Director, Regulatory Affairs

Protective Equipment: If product is involved in a fire, wear full protective clothing including a posit pressure, NIOSH-approved, self-contained breathing apparatus.

Section 6. Accidental Release Measures

Small Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the material. Wearing appropriate personal protective equipment, move the leaking container to a containment area or plug the leak. Absorb on inert material, then shovel up and dispose of according to local, state, federal regulations. Spills of this product are very slippery.
Large Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the product. Wearing appropriate personal protective equipment, close or cap valves and/or block or plug hold in leaking container and transfer to another container for proper disposal. Spills of this product are very slippery.

Section 7. Handling and Storage

To avoid product degradation and equipment corrosion, do not use iron, copper, or aluminum containers or equipment. OSHA regulations (29 CFR 106.a.14) require that the flashpoint of materials of this type be determined by the Pensky-Martens Closed Cup test method. The test for this product indicates it has a flashpoint greater than 200 F (93.3 C). Another method indicates a potential for flash at approximately 154 F (67.8 C); therefore, caution should be exercised in storage and handling. Do not get in eyes, or on skin and clothing. Wash thoroughly after handling. Avoid breathing mists. Do not ingest. Keep away from heat and open flame. Store at ambient temperatures. Keep container securely closed when not in use. Label precautions also apply to empty container. Recondition or dispose of empty containers in accordance with government regulations.

Section 8. Exposure Controls/Personal Protection

Use protective equipment in accordance with 29 CFR 1910 Subpart I. Good enclosure and local exhaust ventilation should be sufficient to control airborne levels. Wear chemical splash goggles or safety glasses with full-face shield. Wear rubber gloves. Wash them after each use and replace as necessary. If conditions warrant, wear impervious protective clothing such as boots, aprons, and coveralls to prevent skin contact. Maintain eyewash fountain and quick-drench facilities in work area.

Section 9. Physical and Chemical Properties

Appearance: Grayish, milky, opaque
Boiling Point: 212 F
Evaporation Rate: N/A
Freezing Point: 0 F
Melting Point: N/A
Molecular Weight: N/D
Odor: Amine
pH: N/A
Physical state: Liquid
Solubility in Water: Limited by viscosity
Specific Gravity: ~ 1.051
Vapor Density: Similar to water
Vapor Pressure: Similar to water
Viscosity: 2.3 min. (cps)
% Volatile: ~ 65-70
Bulk Density: N/A

Section 10. Stability and Reactivity

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Timothy H. Reid

Director, Regulatory Affairs

Protective Equipment: If product is involved in a fire, wear full protective clothing including a positive-pressure, NIOSH-approved, self-contained breathing apparatus.

Section 6. Accidental Release Measures

Small Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the material. Wearing appropriate personal protective equipment, move the leaking container to a containment area or plug the leak. Absorb on inert material, then shovel up and dispose of according to local, state, federal regulations.

Large Spill: Construct temporary dikes of dirt, sand, or any readily available inert material to prevent spreading of the product. Wearing appropriate personal protective equipment, close or cap valves and/or block or plug hole in leaking container and transfer to another container for proper disposal.

Section 7. Handling and Storage

Do not get in eyes, or on skin and clothing. Wash thoroughly after handling. Avoid breathing mists. Do not ingest. Keep away from heat and open flame. Store at ambient temperatures. Keep container securely closed when not in use. Label precautions also apply to empty container. Recondition or dispose of empty containers in accordance with government regulations.

Section 8. Exposure Controls/Personal Protection

Use protective equipment in accordance with 29 CFR 1910 Subpart I. Good general ventilation should be sufficient to control airborne levels. Wear chemical splash goggles or safety glasses with full-face shield. Wear rubber gloves. Wash them after each use and replace as necessary. If conditions warrant, wear protective clothing such as boots, aprons, and coveralls to prevent skin contact. Maintain eyewash fountain and quick-drench facilities in work area.

Section 9. Physical and Chemical Properties

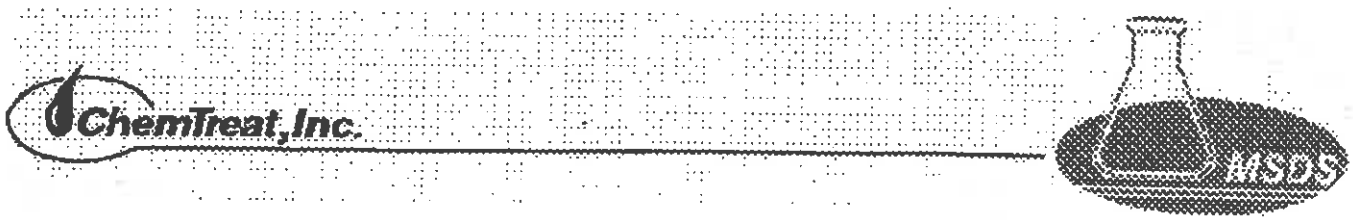
Appearance: Clear, colorless
Boiling Point: 220°F
Evaporation Rate: N/A
Freezing Point: 32°F
Melting Point: N/A
Molecular Weight: N/A
Odor: Mild
pH: ~ 2.7
Physical state: Liquid
Solubility in Water: Miscible
Specific Gravity: ~1.201
Vapor Density: N/A
Vapor Pressure: N/A
Viscosity: N/A
% VOC:

Section 10. Stability and Reactivity

Chemical Stability: Stable at normal temperatures and pressures
Incompatibility: Bases, oxidizers
Hazardous Decomposition Products: None known
Hazardous Polymerization: Will not occur

Section 11. Toxicological Information

Slightly toxic by ingestion. May be irritating to eyes and skin.



MATERIAL SAFETY DATA SHEET

Section 1. Chemical Product and Company Identification

Product Name:	**ChemTreat CT-9004**
Manufacturer's Name:	ChemTreat, Inc.
Emergency Telephone Number:	(800) 424-9300
Address (Corporate Headquarters)	4461 Cox Road, Glen Allen, VA 23060
Telephone Number for Information:	(800) 648-4579
Date of MSDS:	March 9, 2004

Section 2. Composition/Hazardous Ingredients

Component	CAS Registry #	Wt. %
1-Hydroxyethylidene-1,1diphosphonic acid, tetrapotassium salt	14860-53-8	1 - 10
Sodium polyacrylate	9003-04-7	5 - 25
Polyacrylate, copolymer	Proprietary	5 - 25

Section 3. Hazards Identification

Emergency Overview: Straw colored liquid; mild odor. Not flammable.
Potential Health Effects:
Eyes - Irritating to eyes.
Skin - Irritating to skin.
Inhalation - Irritating to respiratory tract.
Ingestion: Low toxicity if ingested.
Chronic Effects/Carcinogenicity: No information available on significant long-term effects.

Section 4. First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.
Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of entire eye surface. Get medical attention if irritation persists.
Skin: In case of contact, immediately wash with plenty of water while removing contaminated clothing. Wash and decontaminate clothing before reuse. Seek medical advice.
Ingestion: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

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Section 10. Stability and Reactivity

Chemical Stability: Stable at normal temperatures and pressures.
Incompatibility: Strong acids.
Hazardous Decomposition Products: Unknown.
Hazardous Polymerization: Will not occur

Section 11. Toxicological Information

Eyes, skin and inhalation – irritating; ingestion – low order of toxicity.

Section 12. Ecological Information

Not tested.

Section 13. Disposal Considerations

Dispose of in accordance with local, state, and federal regulations.

Section 14. Transport Information (not meant to be all inclusive)

D.O.T. Shipping Name: Not D.O.T. Regulated

Section 15. Regulatory Information (*Not meant to be all inclusive – selected regulation represented*)

TSCA Status: All ingredients listed
CERCLA Reportable Quantity: None
SARA Title III:
Section 302 Extremely Hazardous Substances: None
Section 313 Toxic Chemicals: None
CALIFORNIA PROPOSITION 65: None known.

Section 16. Other Information

Hazard (NFPA) Rating:
Health 1 Flammability 0 Reactivity 0

SARA Hazard Categories – Section 311/312
Acute – Yes Chronic – No Fire – No Reactive – No Sudden Release – No

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, ChemTreat, Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ChemTreat, Inc. be responsible for damages of any nature whatsoever resulting from the use or reliance upon information.
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Timothy N. Reid

Director, Regulatory Affairs

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Not available.

Sensitivity to mechanical impact: Not available.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.
Oxygen.
Hydrogen.
Carbon.

Rate of burning: Not available.

Explosive power: Containers may rupture if exposed to heat or fire.

Section 5 : REACTIVITY DATA

Chemical stability: Product is stable under normal handling and storage conditions.

Conditions of instability: Extreme temperatures.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong alkalies.
Strong oxidizing agents.

Hazardous decomposition products: See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of Acute Exposure

Eye contact: Irritant.

Skin contact: Slight irritation upon prolonged contact.

Inhalation: May cause slight irritation.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: Contains an ingredient which may be corrosive.

Respiratory/Type: None required under normal use.
If exposed to misting.
NIOSH approved respirator for vapours and mists.

Eye/Type:

Chemical safety goggles with side-shields.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.
Ventilation should be corrosion-proof.

BRENNTAG

BRENNTAG MID-SOUTH, INC.
MATERIAL SAFETY DATA SHEET
Effective Date: December 13, 2004

CITRIC ACID SOLUTION

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist or spray may cause irritation.

EYE CONTACT: May irritate eyes.

SKIN CONTACT: May irritate skin upon prolonged or repeated over-exposure.

INGESTION: None listed

PRIMARY ROUTES OF ENTRY: Inhalation, eyes and skin , ingestion.
CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN: NTP/No IARC/No OSHA/No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. Give artificial respiration if not breathing. Get prompt medical attention.

EYE CONTACT: Flush eyes with plenty of water while holding eyelids open. Get prompt medical attention if irritation occurs.

SKIN CONTACT: Flush skin with plenty of water. Remove and wash contaminated clothing prior to reuse.

INGESTION: Seek medical attention.

SECTION VI – TOXICOLOGICAL INFORMATION

For 100% Citric acid: (rat)
Oral LD50 – 11,700 mg/kg
Dermal (acute) – 500 mg/24 hr, moderate
Eye – 750 mg/24 hr, severe

SECTION VII – ECOLOGICAL INFORMATION

No information available

SECTION VIII - REACTIVITY DATA

STABILITY: Stable **HAZARDOUS POLYMERIZATION:** none

CONDITIONS TO AVOID: Avoid evaporating to dryness and generating dust.

INCOMPATIBILITY (MATERIALS TO AVOID): Metal nitrates, carbonate, bicarbonates and strong oxidizers. Citric acid corrodes copper, zinc, aluminum and their alloys

HAZARDOUS DECOMPOSITION PRODUCTS: May release hydrogen gas with contact with copper, zinc, aluminum and their alloys

BRENNTAG

BRENNTAG MID-SOUTH, INC.
MATERIAL SAFETY DATA SHEET
Effective Date: December 13, 2004

CITRIC ACID SOLUTION

SECTION XIII – REGULATORY INFORMATION

This Regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

TSCA (Toxic Substance Control Act): All components of this product are listed on the TSCA inventory.

Super Fund Amendments and Reauthorization Act (SARA) of 1986, Section 313, Title III, CFR 40 Part 372: none

CERCLA RQ 40 CFR302.4: none

SARA TITLE III: HAZARD CLASSIFICATIONS: Acute: yes Chronic: no Fire: no Pressure: no Reactivity: no

SARA 302 Components 40 CFR 370.2: None

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PREPARED BY

APPROVED BY

C:\RD1\WORD\MSDS\CITRIC ACID SOLUTION

FORMAT REVISION DATE: April 23, 2001

General Chemical

MATERIAL SAFETY DATA SHEET
Dry Alum

4. FIRST AID MEASURES

SKIN: Flush with plenty of soap water, removing contaminated clothing. If irritation develops, get medical attention.

EYES: Immediately flush with water, continuing for at least 15 minutes. If irritation persists, get medical attention.

INHALATION: Promptly remove to fresh air.

INGESTION: If conscious, immediately give large quantity of water or milk. If not already vomiting, induce vomiting by touching finger to back of throat. Get medical assistance.

ADVICE TO PHYSICIAN: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:
Product is not flammable. Use any extinguishing agent suitable for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:
Use self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (See section 8 for recommended personal protective equipment.)
Shovel up dry chemical and place in empty container and cover. Spray residue with plenty of water. Neutralize any further residue with alkali such as soda ash, lime or limestone. Adequate ventilation is required if soda ash or limestone is used, because of the consequent release of carbon dioxide gas. Collect liquid and/or residue and dispose of in accordance with applicable regulations.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (See section 8 for recommended personal protective equipment.)
Avoid contact with skin, eyes and clothing. Do not breathe product dusts or mists.

General Chemical

MATERIAL SAFETY DATA SHEET

Dry Alum

VAPOR PRESSURE:	Negligible		
VAPOR DENSITY (air = 1.0):	Not applicable		
EVAPORATION RATE:	Not applicable	**COMPARED TO:**	Not applicable.
% VOLATILES:	Not applicable		
FLASH POINT:	Not flammable		

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):
Normally stable. Avoid temperatures above 760°C, as this will yield toxic and corrosive gases.

INCOMPATIBILITIES:
Alkalis and water reactive materials such as oleum; causes exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS:
At elevated temperatures, sulfur oxides may be formed. These are toxic and corrosive and are oxidizers. Sulfur trioxide is also a fire hazard. The loss of these gases leaves a caustic residue.

HAZARDOUS POLYMERIZATION:
Will not occur

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:
Aluminum sulfate:
LD_{50} (oral, mouse): 6207 mg/kg
LD_{50} (oral, rat): 1930 mg/kg

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:
Data not available

OTHER DATA:
None

12. ECOLOGICAL INFORMATION

Aluminum sulfate:
14 ppm/36 hr/ fundulus/fatal/fresh water.
240 ppm/48 hr/mosquito fish/TL_m/water type not specified.
TL_m Mosquito fish, 235 ppm, 96 hours
LC_{50} Largemouth bass, 250 ppm, 96 hours

General Chemical

MATERIAL SAFETY DATA SHEET

Dry Alum

The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirements CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
No ingredients listed in this section.	

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section.		

ADDITIONAL REGULATORY INFORMATION:
None listed

WHMIS CLASSIFICATION (CANADA):
Class D2B.
Classified in accordance with WHMIS Controlled Product regulations.

FOREIGN CHEMICAL CONTROL INVENTORY STATUS:
All ingredients listed on Canadian DSL.

16. OTHER INFORMATION

CURRENT ISSUE DATE: June, 2001
PREVIOUS ISSUE DATE: December, 1993

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:
Updated to ANSI format.

OTHER INFORMATION: None

Potential Chronic Health Effects: Repeated dosage may cause possible damage to the liver and pancreas.

****

Potential Health Effects:

Inhalation: Irritation to mucous membranes, difficulty breathing

Skin Contact: Irritation and possibly burns

Eye Contact: Irritation and possibly burns

Ingestion: Irritation of the mouth and stomach. Symptoms of severe poisoning include stomach pain, vomiting, diarrhea, dehydration, shock, pallor, weak pulse, drowsiness, dilated pupils, and coma.

Sub-chronic Effects: No data available

Chronic Effects: Repeated dosage may cause hemosiderosis with possible damage to the liver and pancreas.

Carcinogenicity: Ferric chloride is not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (Occupational Safety and Health Administration) and not listed as carcinogens by NTP (National Toxicology Program).

SECTION 4 – FIRST AID MEASURES

General: If you feel unwell, seek medical advice (show the label where possible). Effects of exposure (inhalation, ingestion or skin contacts) to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Inhalation: If symptoms are experienced, move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention IMMEDIATELY.

Skin Contact: Remove contaminated clothing, jewellery and shoes. Immediately wash skin with soap or mild detergent and running water for at least 15-20 minutes, until no evidence of chemical remains. For minor skin contact, avoid spreading material on unaffected skin. For burns, obtain medical attention immediately.

Eye Contact: Immediately flush eyes with running water for at least 20 minutes, occasionally lifting upper and lower lids, until no evidence of chemical remains. Obtain medical attention IMMEDIATELY.

Ingestion: If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. Avoid gastric lavage or emesis.

Storage Requirements: Store in tightly closed container, preferably the supplier container. Do not store in metal containers. Fibreglass, plastic or rubber-lined tanks may be used for storage. Protect from damage. Keep dry. Read the label before use. Keep separated from incompatible substances.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

PREVENTIVE MEASURES

Recommendations listed in this section indicate the type of equipment, which will provide protection against over-exposure to this product. Conditions of use, adequacy of engineering or other control measures and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: A ventilation system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Ensure that eyewash station and safety showers are proximal to the workstation location.

PERSONAL PROTECTIVE EQUIPMENT

Eye Protection: Wear splash resistant chemical goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. **Recommended Protective Material:** Neoprene

Respiratory Protection: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

- Any chemical cartridge respirator with acid gas cartridge(s)
- Any chemical cartridge respirator with a full face piece and acid gas cartridge(s)
- Any air-purifying respirator with a full-face piece and an acid gas canister.
- For Unknown Concentrations or Immediately Dangerous to Life or Health (IDLH)
  Any supplied air respirator with full-face piece and operated in a pressure-demand or other positive-pressure mode.

EXPOSURE GUIDELINES

Product: ACGIH: TLV – 1 mg/m^3 (as Fe) (Iron salts, soluble)

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicological Information: TLm Daphnia 15 ppm/96 hr fresh water / Conditions of bioassay not specified

Persistence and Degradation: No data available

SECTION 13 - DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal.

Whatever cannot be saved for recovery or recycling, including containers, should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

RCRA: Test waste material for corrosivity, D002, prior to disposal.

SECTION 14 - TRANSPORTATION REGULATIONS

	Canada (TDG)	U.S. (DOT)
Shipping Name	Ferric Chloride Solution	Ferric Chloride Solution
Hazard Class/Division	8: Corrosive liquid 9.2: Environmentally hazardous material	8: Corrosive liquid
Identification No. **Packing Group:**	UN2582 II	UN2582 II

Transportation Emergency Telephone Number: 1800-424-9300 CHEMTREC

IATA/ICAO Class: 8

SECTION 15 - REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1920.1200)

CERCLA: hazardous substance/reportable quantity (RQ): final RQ = 1000 lb. (454 kg)

SARA Regulations sections 313 and 40 CFR 372: N

SARA Hazard Categories, SARA SECTIONS 311/312 (40CRF370.21):
Acute: Y
Chronic: N
Fire: N
Reactive: N
Sudden Release: N
OSHA Process Safety (29CFR1910.119): Y

REFERENCES:

1. **RTECS-Registry of Toxic Effects of Chemical Substances,** On-line search, Canadian Centre for Occupational Health and Safety RTECS database, Doris V. Sweet, Ed., National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, Updated Dec 1997.
2. **"CHEMINFO"**, through **"CCINFOdisc"**, Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada (August 1998).
3. **HSDB-Hazardous Substances Data Bank,** through "CCINFO disc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (August 1998).
4. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, June 1997
5. Sax, N.I., "Dangerous Properties of Industrial Materials", 7th Edition, 1989
6. "1999 Threshold Limit Values and Biological Exposure Indices", American Conference of Government Industrial Hygienists, 1999.
7. Merck, 11th Edition, 1989

Legend:

CAS # - Chemical Abstracts Service Registry Number
CERCLA- Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
DOT - Department of Transportation
LC_{50} - The concentration of material in air expected to kill 50% of a group of test animals
LD_{50} - Lethal Dose expected to kill 50% of a group of test animals
LEL - Lower Explosive Limit
MSHA - Mine Safety and Health Administration
NIOSH - National Institute for Occupational Safety and Health
PEL - Permissible Exposure Limit
PVC - Polyvinyl chloride
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reauthorization Act of the U.S. EPA
STEL - Short Term Exposure Limit
TC - Transport Canada
TDG - Transportation of Dangerous Goods Act/Regulations
TLV - Threshold Limit Value
TSCA - Toxic Substances Control Act
TWA - Time-Weighted Average
UEL - Upper Explosive Limit

Prepared By: KEMIRON
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Date MSDS Prepared/Revised	PRE-HCS
Date of Technical Review	07MAY79
Active Indicator	N
Item Manager	CX

Alternate Vendors

Vendor #5 CAGE	BFHMX

SECTION III - Physical/Chemical Characteristics

Specification Number	O-S-602
Hazard Storage Compatibility Code	C3-L3
Appearance/Odor	LIGHT YELLOW COLOR;SLIGHT CHLORINE ODOR
Boiling Point	UNK
Specific Gravity	1.090
Solubility in Water	APPRECIABLE
Container Pressure Code	4
Temperature Code	8
Product State Code	U

SECTION IV - Fire and Explosion Hazard Data

Flash Point Method	UNK
Extinguishing Media	NONE
Special Fire Fighting Procedures	NONE
Unusual Fire/Explosion Hazards	NONE

SECTION V - Reactivity Data

Stability	YES
Stability Conditions to Avoid	AVOID SUNLIGHT & TEMPERATURES > 90F.DECOMPOSES GIVES OXYGEN
Materials to Avoid	ACIDS,SOAPS,ORGANICS,TOILET CLEANERS-SEE SUPPLEMENTAL DATA
Hazardous Decomposition Products	CHLORINE ON CONTACT WITH ACIDS
Hazardous Polymerization	NO

SECTION VI - Health Hazard Data

Symptoms of Overexposure	IRRITATION OF EYES;SKIN IRRITATION WITH BLISTERING & ECZEMA;BLISTERING IN

	EXPLOSIVE]]
Disposal Code	O

SECTION IX - Label Data

Protect Eye	NO
Protect Skin	NO
Protect Respiratory	NO
Chronic Indicator	UNKNOWN
Contact Code	UNKNOWN
Fire Code	UNKNOWN
Health Code	UNKNOWN
React Code	UNKNOWN

SECTION X - Transportation Data

Container Quantity	1
Unit of Measure	GL

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)	0
Volatile Organic Compounds (G/L)	0

SECTION XII - Ingredients/Identity Information

Ingredient #	01
Ingredient Name	HYPOCHLOROUS ACID, SODIUM SALT
CAS Number	7681529
NIOSH Number	NH3486300
Proprietary	NO
Percent	5.25
ACGIH TLV	UNKNOWN
Ingredient #	02
Ingredient Name	SODIUM CHLORIDE
NIOSH Number	VZ4725000
Proprietary	NO
Percent	6.0
ACGIH TLV	UNKNOWN
Ingredient #	03
Ingredient Name	WATER
NIOSH Number	ZC0110000
Proprietary	NO
Percent	87.0
ACGIH TLV	N/A

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Prestochlor Calcium Hypochlorite Granules
PRODUCT ID: 27488
SYNONYMS: Calcium Hypochlorite Granular; Cal Hypo Granules; Ca(OCl)2
ISSUE DATE: 07/18/2001
EDITION NO.: 8

PPG Industries, Inc.
One PPG Place, Pittsburgh, PA 15272, USA
24-hour Emergency Telephone Number: 1-304-843-1300
For Product Information (8am-5pm Eastern time):
1-800-245-2974 (Cal Hypo)

PREPARER: Product Safety, Chemicals

2. COMPOSITION/INFORMATION ON INGREDIENTS

Material/CAS Number	Percent
Calcium Hypochlorite 7778-54-3	>65

Note: 65% Available Chlorine. 35% inert ingredients (includes 5.5-10% moisture).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! Strong Oxidizing Agent! Mix only with water. Contamination may cause fire or explosion. Do not add this product to any dispensing device containing remnants of any other product.

Precautions: Do not swallow. Swallowing may cause injury or death. Do not get in eyes, on skin, or on clothing. May cause burns. Avoid breathing dust. Irritating to nose and throat. Wash hands after handling. Keep out of reach of children.

4. FIRST AID MEASURES

INHALATION: Remove from area to fresh air. If symptomatic, contact a poison control center.

PPG: 27488 Prestochlor Calcium Hypochlorite Granules 07/18/2001

placing in trash collection. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:
8-hour Time Weighted Average (TWA); 15-minute Short-Term Exposure Limit (STEL)

OSHA: No occupational exposure limits have been established by OSHA for this product.

ACGIH: No occupational exposure limits have been established by ACGIH for this product.

PPG (IPEL): 1 mg/cu.m. TWA. 2 mg/cu.m. STEL.

RESPIRATORY PROTECTION: If dusty conditions are encountered, use NIOSH approved respirator with acid gas cartridge and dust prefilter. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

VENTILATION: None required unless dusty conditions are encountered.

EYE AND FACE PROTECTION: Chemical safety goggles.

PROTECTIVE GLOVES: Natural or synthetic rubber.

OTHER PROTECTIVE EQUIPMENT: Boots, aprons, or chemical suits should be used when necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 (general requirements), .133 (eye and face protection), and .138 (hand protection).

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT:	Decomposes at 180° C
VAPOR DENSITY (Air=1):	NA
SPECIFIC GRAVITY (Water=1):	NA
pH:	Alkaline
FREEZING/MELTING POINT:	NA
SOLUBILITY (wt.% in water):	217 g/l @ 27° C
BULK DENSITY:	65-67 lbs./cu.ft.
VOLUME % VOLATILE:	NA
VAPOR PRESSURE:	NA
EVAPORATION RATE:	NA
HEAT OF SOLUTION:	Slightly exothermic
PHYSICAL STATE:	Powder
ODOR:	Slight chlorine
COLOR:	White