



On March 21, 2022, at approximately 11:26 AM, the plant experienced a partial power outage, causing many of the variable frequency drives on pumps and fans throughout the plant to fault and shut down. This resulted in RTO-1400 on the drum dryer and RTO-1900 on the ring dryer to shut down along with the fans on both dryers. This caused both dryers to vent immediately to atmosphere. The distillation scrubber immediately came on-line once RTO-1400 shut down, resulting in no deviation emissions from distillation operations. The fermentation scrubber RTO1500 also shut down due to the event, but the scrubber came on immediately once the RTO went offline. Excess emissions from this event are summarized below.

**Table 1 - Estimated Uncontrolled Dryer VOM/HAP Emissions
 Partial Plant Power Outage on March 21, 2022 at 11:26 AM**

When plant power was interrupted, the rotary dryer emergency relief vent immediately opened to atmosphere. The dryer, dryer RTO, and all dryer fans lost power and stopped operating. Due to the lack of air flow through the dryer it took an extended period of time for the outlet dryer temperature to reach 130°F - the point at which VOM and HAP emissions are negligible. Due to the lack of air flow, excess emissions would have been minimal; however, for the purpose of this emission estimate we have calculated emissions as if this was a typical dryer shutdown with continuing air flow and a typical period of 90-minutes to reach an outlet temperature of 130°F resulting in a conservative estimate of actual emissions.

21-Mar-22 11:26 AM Parameter	Dryer By-Pass Uncontrolled Emissions	
	(lbs)	tons
Duration	90 min	
PM/PM10	1.95	0.001
CO	16.79	0.008
VOM	67.56	0.034
Total HAPs	4.60	0.002
Acetaldehyde	1.149	0.001
Acrolein	0.919	0.000
Formaldehyde	1.838	0.001
Methanol	0.689	0.000

Uncontrolled dryer VOM emissions based on May 2016 compliance testing.

**Table 2 - Estimated Uncontrolled Distillation Scrubber VOM/HAP Emissions
 Partial Plant Power Outage on March 21, 2022 at 11:26 AM**

The distillation process emissions were ducted to the dryer RTO at the time of this event. When power to the dryer RTO was lost, the distillation scrubber immediately came on-line, so there were no uncontrolled process emissions during this event.

Compound	Uncontrolled Distillation Scrubber VOM Emissions August 2003 Test (lb/hr)	Uncontrolled Distillation Scrubber VOM Emissions 0.00 Hrs	
		(lbs)	(tons)
Acetaldehyde (HAP)	4.62	0.00	0.0000
Formaldehyde (HAP)	0.00	0.00	0.0000
Acrolein (HAP)	0.00	0.00	0.0000
Methanol (HAP)	0.06	0.00	0.0000
Total HAPs	4.68	0.00	0.0000
Total VOM (MSF)	85.33	0.00	0.0000

**Table 3 - Estimated Uncontrolled Ring Dryer VOM/HAP Emissions
 Partial Plant Power Outage on March 21, 2022 at 11:26 AM**

The ring dryer was operating at the time of this event, which caused EV-1835 (Dryer Exhaust to atmosphere Damper) to open immediately and vent to atmosphere. Since all power was lost, it took an extended time for the dryer to vent; however, the entire volume of air remaining in the dryer at the time of the outage is considered to be exhausted.

21-Mar-22 11:26 AM Parameter	Dryer By-Pass Uncontrolled Emissions	
	(lbs)	tons
PM/PM10	0.07	0.00004
CO	6.96	0.003
SO2	0.04	0.00002
VOM	14.74	0.007
Total HAPs	5.41	0.003
Acetaldehyde	4.095	0.002
Acrolein	1.310	0.001
Formaldehyde	3.276	0.002
Methanol	0.737	0.000

Uncontrolled ring dryer emissions are based on a calculation of the remaining volume of air in the dryer ductwork at the time the Dryer Exhaust opens to atmosphere.



**Table 4 - Estimated Uncontrolled Fermentation VOM/HAP Emissions
 Partial Plant Power Outage on March 21, 2022 at 11:26 AM**

The fermentation scrubber came on immediately once the RTO went offline, resulting in no excess emissions from fermentation operations.

Time	Excess Emissions Duration (hrs)	Ferm. Tank #1		Ferm. Tank #2		Ferm Tank #3		Ferm Tank #4		Ferm Tank #5		Total VOM Uncontrolled (lbs)
		Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	
10/19/20 7:16 AM			#N/A		#N/A		#N/A		#N/A		#N/A	
			#N/A		#N/A		#N/A		#N/A		#N/A	
			#N/A		#N/A		#N/A		#N/A		#N/A	
Totals	0.00											-

Fermentation Process Emission Estimate

Compound	Uncontrolled VOM Emissions by FTIR		Estimated Uncontrolled Fermentation Emissions	
	Low Flow Uncontrolled VOM ^a (lb/hr)	Percent of Total VOM by FTIR (%)		
			(lbs)	(tons)
Acetaldehyde	3.0000	0.8192%	0.0000	0.0000
Formaldehyde	0.3967	0.1083%	0.0000	0.0000
Acrolein	0.0000	0.0000%	0.0000	0.0000
Methanol	0.0200	0.0055%	0.0000	0.0000
Total HAPs			0.0000	0.0000
Total VOM (M25A)	366.20		0	0.00

a. Distribution of HAPs in VOM emissions based on uncontrolled emissions from August 2006 testing upstream of scrubber during low flow conditions.

**Table 5 - Estimated Total Uncontrolled VOM/HAP Emissions from Deviation Event
 Partial Plant Power Outage on March 21, 2022 at 11:26 AM**

Compound	Estimated Uncontrolled VOM / HAP Emissions from Event	
	(lbs)	(tons)
Acetaldehyde (HAP)	5.24	0.0026
Formaldehyde (HAP)	5.11	0.0026
Acrolein (HAP)	2.23	0.0011
Methanol (HAP)	1.43	0.0007
Total HAPs	14.01	0.0070
Total VOM (MSF)	82	0.04