

Darling Ingredients Inc. Tacoma Facility - Permitting Workbook

Potential to Emit

Unit Information - Rendering Operation	
Equipment Description:	Rendering Operation
Emissions Points	RTO and Room Air Scrubber
Maximum Daily Throughput - Raw Material	500 tons/day
% Solid	19.5%
% Moisture	65%
Maximum Annual Throughput - Raw Material	182,500 tons/year
TO Heat Input Rating	18 MMBtu/hr
Room Air Scrubber Flowrate	100,000 CFM
Maximum Daily Schedule	24 hrs/day
Maximum Annual Schedule	365 days/day
Molar Specific Volume	379.5 scf/lbmole

Room Air Scrubber		
Criteria Pollutant	EF	Reference
PM ₁₀	0.001 gr/dscf	SJVAPCD Project C-1172884 - based on average of selected source test results for room air scrubber for a meat rendering operation permitted as N-1252-30
VOC	3.2 ppmv as CH ₄	SJVAPCD Project C-1172884 - based on average of selected source test results for room air scrubber for a meat rendering operation permitted as N-1252-30
H ₂ S	0.75 ppmv	SJVAPCD Project C-1172884 - based on average of selected source test results for room air scrubber for a meat rendering operation permitted as N-1252-30

TO		
Criteria Pollutant	EF	Reference
NO _x	0.0069 lb/ton of raw material	
SO _x	0.0335 lb/ton of raw material	
PM ₁₀	0.0033 lb/ton of raw material	
CO	0.0137 lb/ton of raw material	
VOC	0.0052 lb/ton of raw material	Proposed based on similar operation - SJVAPCD Project C-1172884

TO		
TAP	EF	Reference
Acetaldehyde	3.10E-06 lb/MMBtu	
Acrolein	2.70E-06 lb/MMBtu	
Benzene	5.80E-06 lb/MMBtu	
Ethylbenzene	6.90E-06 lb/MMBtu	
Formaldehyde	1.23E-05 lb/MMBtu	
Hexane	4.60E-06 lb/MMBtu	"Natural Gas Fired External Combustion Equipment" in the May 2001 update of VCAPCD

Naphthalene	3.00E-07 lb/MMBtu	AB 2588 Combustion Emission Factors
PAH's (excl. naphthalene)	1.00E-07 lb/MMBtu	
Propylene	5.30E-04 lb/MMBtu	
Toluene	2.65E-05 lb/MMBtu	
Xylenes (mixed)	1.97E-05 lb/MMBtu	

Room Air Scrubber		
Criteria Pollutant	Daily PE	Annual PE
PM₁₀	20.6 lbs/day	7,509 lbs/year
VOC	19.4 lbs/day	7,091 lbs/year

TO		
Criteria Pollutant	Daily PE	Annual PE
NO_x	3.5 lbs/day	1,259 lbs/year
SO_x	16.8 lbs/day	6,114 lbs/year
PM₁₀	1.7 lbs/day	602 lbs/year
CO	6.9 lbs/day	2,500 lbs/year
VOC	2.6 lbs/day	949 lbs/year

Room Air Scrubber		
TAP	Hourly PE	Annual PE
H₂S	0.4 lbs/hour	3,532 lbs/year

TO		
TAP	Hourly PE	Annual PE
Acetaldehyde	5.58E-05 lbs/hour	4.89E-01 lbs/year
Acrolein	4.86E-05 lbs/hour	4.26E-01 lbs/year
Benzene	1.04E-04 lbs/hour	9.15E-01 lbs/year
Ethylbenzene	1.24E-04 lbs/hour	1.09E+00 lbs/year
Formaldehyde	2.21E-04 lbs/hour	1.94E+00 lbs/year
Hexane	8.28E-05 lbs/hour	7.25E-01 lbs/year
Naphthalene	5.40E-06 lbs/hour	4.73E-02 lbs/year
PAH's (excl. naphthalene)	1.80E-06 lbs/hour	1.58E-02 lbs/year
Propylene	9.54E-03 lbs/hour	8.36E+01 lbs/year
Toluene	4.77E-04 lbs/hour	4.18E+00 lbs/year
Xylenes (mixed)	3.55E-04 lbs/hour	3.11E+00 lbs/year

Unit Information - Protein Grinding and Storage	
Equipment Description:	Protein Grinding System consisting of two screw conveyors, one hammermill (served by a cyclone), one vibratory screen, two rerun conveyors and storage silos
Emissions Points	Room Air Scrubber and Silo Bin Vents
Maximum Daily Throughput - Raw Material	500 tons/day
% Solid	19.5%
% Moisture	65%
Maximum Daily Throughput - Solid	98 tons/day
Maximum Annual Throughput - Solid	35,588 tons/year
Maximum Daily Schedule	24 hrs/day
Maximum Annual Schedule	365 days/day

PM10 Emission Factors for Protein Grinding and Storage		
Activity	PM10 EF	Reference
Conveyor to Grinding Process¹	0.00008 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed Mills – Uncontrolled Shipping adjusted by room air scrubber (90% control)

Grinding¹	0.0335 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed mills – Hammermill – controlled by Cyclone, assuming 50% of PM is PM ₁₀ and adjusted by room air scrubber (90% control)
Screening¹	0.0335 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed mills – Hammermill – controlled by Cyclone, assuming 50% of PM is PM ₁₀ and adjusted by room air scrubber (90% control)
Rerun Conveyors¹	0.00008 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed mills – Shipping – uncontrolled, adjusted by room air scrubber (90% control)
Storage Silo Conveyors¹	0.00008 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed mills – Shipping – uncontrolled, adjusted by room air scrubber (90% control)
Silo Loading	0.000008 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed Mills – Uncontrolled Shipping adjusted by bin vent (99% control)
Truck Unloading	0.0008 lb/ton of solid	EPA AP-42, Table 9.9.1-2, Animal Feed Mills – Uncontrolled Shipping

1. These emissions are included in the room air scrubber emissions

PTE for Protein Grinding and Storage		
Criteria Pollutant	Daily PE	Annual PE
PM ₁₀	0.1 lbs/day	29 lbs/year