DARLING INGREDIENTS

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Via eForms

May 6, 2025

Mr. Zach Bittner
Kentucky Department for Environmental Protection
Division for Air Quality
300 Sower Boulevard
Frankfort, KY 40601

Subject: Application to Renew Title V Operating Permit
Darling Ingredients Inc. – Butler, Kentucky Facility
Title V Operating Permit No.: V-19-023
AI No.: 3408

To Whom It May Concern,

Darling Ingredients Inc. (Darling) herein provides an application to the Kentucky Department for Environmental Protection (KDEP) for renewal of the subject Title V Air Permit for Darling's Butler facility.

Included in the attached application package is a supporting narrative that provides:

1. a recapitulation of permitting history, including since Darling's most recent Title V renewal application,
2. a description of the herein-requested revisions (modifications),
3. combustion and process emission factors used for unlimited potential to emit (PTE) calculations,
4. PTE emission calculations, and
5. KDEP application forms.

Per Darling's discussions with the KDEP (Mr. Zach Bittner), only pertinent KDEP forms have been attached. Per 401 KAR 52:020, "*Applications for permit renewals shall provide only the information that is new or different from the most recent source-wide permit application…*" Thus, Darling has included the KDEP forms for information that has changed pursuant to Darling's request in the attached application narrative. If there should be any questions concerning the information in this application, please contact me at your convenience at the address or telephone number listed at the top of the page, or you may contact me by email at kthomas@darlingii.com.

Sincerely,
DARLING INGREDIENTS INC.

Kelly Thomas

Kelly Thomas
Director of Environmental Affairs

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Attachments: KDEP Title V Application

cc: Brandon Lachner, Regional VP (email only)
Jon Thelen, VP of Bakery Feeds (email only)
Rick Speaks, VP of Bakery Feeds (email only)
Brad Eden, General Manager, Rendering Operations (email only)
Nathan Hatfield, General Manager, Bakery Feeds Operations (email only)

DARLING INGREDIENTS INC.

1176 Bryan Griffin Road

Butler, KY 41006

Application for Renewal & Modifications

Title V Permit No.: V-19-023

May 6, 2025

AIR PERMIT INFORMATION
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I. History of Permitting

On August 1, 2019, Darling Ingredients (Darling) submitted an application to renew the subject Title V Operating Permit V-13-010 R2 for the Darling facility located in Butler, Kentucky (Facility). The KDEP subsequently issued the Title Air Operating Permit No. V-19-023 (Permit) on November 8, 2020.

On May 4, 2020, Darling submitted a 502(b)(10) change to place the previous contingency backup packed tower scrubber into full-service operation. The scrubber was placed into operation after the main venturi scrubber for conditioning of the air stream prior to subsequent treatment by the regenerative thermal oxidizer (RTO). Darling decided to place the packed tower scrubber to full-time duty as a continuous pre-scrubbing conditioning opportunity prior to the RTO, mainly to reduce the temperature and moisture saturation of the gas stream entering the RTO. This style of a pre-conditioning scrubber system also further reduces odor and sulfur compounds, as experienced from emissions testing at similar operating Darling facilities. Should the RTO go down for repair, maintenance, etc., the air stream is discharged directly to the atmosphere from the packed tower scrubber. **The KDEP incorporated the information contained in the 502(b)(10) change in the November 2020 renewal of the Permit.**

On December 29, 2022, Darling submitted a notification that the Dupps 4300 Discor Cooker, permitted with the Rendering Process (Emission Unit [EU]04), had reached maturity and equipment life cycle. The unit was replaced with another identical Dupps 4300 Discor Cooker. On February 22, 2024, the KDEP responded the agreeance with the "in-kind" replacement.

II. Facility Operations and Emission Units/Emission Points

Table I reflects the current and proposed EU inventory permitting at the Darling Butler facility.

Table I
Emission Units/Emission Points Currently Permitted

Emission Unit ID	Emission Point ID	Description
02	02	33.5 mmBtu/hr Cleaver Brooks Boiler
04	04 & 05	Rendering Process (Controlled by Venturi Scrubber/Packed Tower Scrubber, Regenerative Thermal Oxidizer, and Room Air Scrubber)
06	07	Biomass Burner and Dryer
07	08	Product/Blending Stock Mixing, Size Reduction, and Storage
09	10	277 HP Diesel-Fired Emergency-Power Generator RICE (Stationary)
10	11	63 mmBtu/hr Victory Energy Boiler
11	12	465 HP Diesel-Fired RICE
12	13	20 ton/hr Bakery Product Grinder
13	14	29.291 mmBtu/hr Cleaver Brooks Boiler
~~14~~	~~15~~	~~3.348 mmBtu/hr Cleaver Brooks Boiler~~ **(removed from service and decommissioned January 2021)**
~~15~~	~~16~~	~~1.6 mmBtu/hr Fulton Boiler~~ **(removed from service and decommissioned January 2021)**

III. Request for Revisions (Modifications)

Darling requests the following permit modifications:

1. In January 2021, Darling decommissioned the Cleaver Brooks Boiler (EU14) and the Fulton Boiler (EU15). Darling requests the conditions associated with these units in Section B of the Permit, be removed.

IV. Requested Fuels and Combustion Emissions Calculations

Rendering Combustion Discussion

TABLE II
Rendering Facility Combustion Units

Equipment	Manufacturer	Permitted Heat Input
Boiler EU02	Cleaver Brooks	33.5 mmBtu/hr
Boiler EU10	Victory Energy	63 mmBtu/hr
Boiler EU13	Cleaver Brooks	29.291 mmBtu/hr
RTO Burner EU04	Jay Gee Manufacturing Custom	3 mmBtu/hr
Diesel-Fired RICE EU09	Cummins	277 HP (1.939 mmBtu/hr)

Boilers EU02, EU10, EU13, EU14, & EU15, & RTO Burner EU04

The boilers (EU02, EU10, and EU13) are currently permitted to combust natural gas, processed fats, biodiesel, and LSD (0.05% sulfur or less). The RTO (EU04) is permitted to combust only natural gas.

All of the emission factors (EFs) presented below (bullets) for facility combustion units have been previously presented to and accepted by the KDEP in previous permitting iterations for the facility; Darling therefore simply recapitulates for the KDEP.

- The combustion PTE from Boiler EU10 have been calculated using U.S. Environmental Protection Agency's (EPA) AP-42[1] EFs for low Nitrogen Oxide (NO_x) combustion technology /flue gas recirculation external combustion sources with less than 100 million British thermal units per hour (mmBtu/hr) heat input, and recent actual compliance performance emissions testing data conducted by Darling on similar low NO_x boiler equipment. The AP-42 EFs for Volatile Organic Compounds (VOC), SO_2, and PM species emissions from natural gas combustion (Chapter 1, Tables 1.4-1 and 1.4-2) were last updated in July 1998. According to footnote "c" to Table 1.4-2, all PM (total, condensable, and filterable) from natural gas combustion is assumed to be less than one micron (PM_1); and therefore, used to estimate PM less than ten microns (PM_{10}), less than 2.5 microns ($PM_{2.5}$), or PM_1 emissions. The EFs for Carbon Monoxide (CO) and NO_x emissions from natural gas combustion were obtained during an actual July 2011 compliance performance emissions test conducted at the Darling Jackson, Mississippi, facility on a new boiler equipped with a low NO_x burner.

- The burners for Boilers EU02 and EU13 are not equipped with low NO_x equipment technology, and combustion emissions PTE are therefore calculated using AP-42 PM, VOC, SO_2, CO and NO_x EFs for natural gas combustion in eternal combustion

[1] US EPA AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources Chapter 1, Tables 1.4-1 and 1.4-2, last updated in July 1998

sources with less than 100 mmBtu/hr heat input (for not low NO_x burners) (Chapter 1, Tables 1.4-1 and 1.4-2), last updated in July 1998.

- Darling utilized AP-42 EFs from Chapter 1.3 – Fuel Oil Combustion (last updated in May of 2010) for PM, VOC, SO_2, CO, and NO_x emissions for fuel oil fired units (Tables 1.3-1, 1.3-2, and 1.3-5) as well as $PM_{2.5}$ and PM_{10} from Table 1.3-6 to calculate the boilers' LSD fuel-derived PTE emissions. Note: $PM_{2.5}$ and PM_{10} emissions are a combination of condensable emissions from Table 1.3-2 and specific particle size EF from Table 1.3-6.

- Darling developed the processed fats and biodiesel combustion EFs based on engineering tests conducted at another Darling facility on a 1,200 HP 50.219 mmBtu/hr boiler. This engineering testing did not include delineation of $PM_{2.5}$/PM_{10} emissions; however, Darling believes that all PM emissions from the combustion of processed fats fuel are PM_{10}, and that $PM_{2.5}$ emissions are negligible as the processed fats and biodiesel fuels do not contain any metals, or toxic/hazardous constituents, and contain only negligible VOC and sulfur content.

- The combustion emission rates and PTE from the regenerative thermal oxidizer (RTO) burner for NO_x and CO are also as described above for the boilers (for not low NO_x burners). RTO burner VOC, SO_2, $PM_{2.5}$, PM_{10}, and PM combustion emission rates and PTE are included in the process emissions (see Process Emissions section below); they were derived from RTO emissions testing conducted at RTO exhausts at the facility.

A summary of the EFs used for the facility boilers and the RTO burner, on a fuel unit basis, is provided in Table III.

TABLE III
Rendering Facility Combustion Emission Factors – Fuel Unit Based

	Natural Gas (Low NO_x Boiler EU10)	**Natural Gas (Not Low NO_x Boilers EU02, EU13, & RTO EU04 Burner)**	**Low Sulfur Diesel Fuel (Boilers Only)**	**Processed Fats Fuel (Boilers Only)**	**Biodiesel Fuel (Boilers Only)**
Fuel HHV	1,000 Btu/scf	1,000 Btu/scf	133,650 Btu/gal	125,900 Btu/gal	122,400 Btu/gal
VOC	5.50 lb/10^6 scf	5.50 lb/10^6 scf	0.20 lb/10^3 gal	0.000 lb/10^3 gal	0 lb/10^3 gal
SO_2	0.60 lb/10^6 scf	0.60 lb/10^6 scf	142(S) lb/10^3 gal	0.038 lb/10^3 gal	0 lb/10^3 gal
NO_x	19.0 lb/10^6 scf	100.0 lb/10^6 scf	20 lb/10^3 gal	20 lb/10^3 gal	14.91 lb/10^3 gal
CO	0.60 lb/10^6 scf	84 lb/10^6 scf	5 lb/10^3 gal	2.81 lb/10^3 gal	4.62 lb/10^3 gal
$PM_{2.5}$	7.6 lb/10^6 scf	7.6 lb/10^6 scf	0.25 lb/10^3 gal +1.3 lb/10^3 gal condensables	negligible	negligible
PM_{10}	7.6 lb/10^6 scf	7.6 lb/10^6 scf	1 lb/10^3 gal +1.3 lb/10^3 gal condensables	1.259 lb/10^3 gal	0.46 lb/10^3 gal
PM	7.6 lb/10^6 scf	7.6 lb/10^6 scf	2 lb/10^3 gal	1.259 lb/10^3 gal	0.46 lb/10^3 gal

(S) = Sulfur content in %

For comparison purposes (for worst case fuels), the different fuel unit-based (e.g. standard cubic feet [scf], gallon [gal]) EFs in Table III have been converted to the common unit of pounds per mmBtu (lbs/mmBtu) in Table IV using the fuel higher heating values (HHVs) from Table III. An example calculation (SO_2) of the conversion from pounds of criteria pollutant per unit of fuel to lbs/mmBtu is provided as follows for LSD fuel oil at the maximum 0.05% sulfur content:

$$\frac{142(\%S)\ \text{lb}}{1{,}000\ \text{gallons}} \times \frac{\text{gallon}}{133{,}650\ \text{Btu}} \times \frac{1{,}000{,}000\ \text{Btu}}{\text{mmBtu}} = 0.053\ \text{lbs/mmBtu}$$

TABLE IV
Rendering Facility Combustion Emission Factors – HHV (lbs/mmBtu) Based

	Natural Gas (Low NO_x Boiler EU10)	**Natural Gas (Not Low NO_x Boilers EU02, EU13, & RTO EU04 Burner)**	**Low Sulfur Diesel Fuel (Boilers Only)**	**Processed Fats Fuel (Boilers Only)**	**Biodiesel Fuel (Boilers Only)**
VOC	**0.0055**	**0.0055**	0.001	0.000	0.000
SO_2	0.0006	0.0006	**0.053** [a]	0.0003	0.000
NO_x	0.019	0.1000	0.150	**0.159**	0.122
CO	0.0006	**0.0840** [b]	0.037	0.022	**0.038** [b]
$PM_{2.5}$	0.0076	0.0076	**0.012**	Negligible	Negligible
PM_{10}	0.0076	0.0076	**0.017**	0.010	0.004
PM	0.0076	0.0076	**0.015**	0.010	0.004

[a] (S) = 0.05%

[b] CO emissions are highest for Boiler EU10 when combusting biodiesel and highest for Boilers EU02, EU13 and the RTO (EU04) burner when combusting natural gas.

The EFs from the fuel resulting in the highest emissions per unit of heat input are highlighted in **bold** and underlined text in Table IV for use in the boiler PTE determinations (only the boilers are proposed for alternate backup liquid fuels). For example, for PM, the highest HHV based emission rate will occur when the boilers are fired with LSD fuel oil, for VOC when fired with natural gas, and so forth. Please note that natural gas (not low NO_x) and biodiesel EFs for CO have both been highlighted. CO emissions are highest when combusting natural gas in Boilers EU02 and EU13 and the RTO burner as these are not equipped with low NO_x combustion technology/flue gas recirculation. For Boiler EU10 (equipped with low NO_x combustion technology/flue gas recirculation), CO emissions are highest when combusting biodiesel.

The maximum PTE (in pounds per hour [lbs/hr]) for each criteria pollutant by fuel are calculated below and tabulated in Table V using the maximum rated heat input for the boilers and the RTO burner and worst case (highest) EFs identified in Table IV.

Boiler EU02 at 33.5 mmBtu/hr (Not Low NO_x burners)

VOC	=	0.0055 lbs/mmBtu	x	33.5 mmBtu/hr	=	0.18 lbs/hr (Natural Gas)
SO_2	=	0.053 lbs/mmBtu	x	33.5 mmBtu/hr	=	1.78 lbs/hr (LSD Fuel Oil)
NO_x	=	0.159 lbs/mmBtu	x	33.5 mmBtu/hr	=	5.33 lbs/hr (Processed Fats)
CO	=	0.084 lbs/mmBtu	x	33.5 mmBtu/hr	=	2.81 lbs/hr (Natural Gas)
$PM_{2.5}$	=	0.012 lbs/mmBtu	x	33.5 mmBtu/hr	=	0.40 lbs/hr (LSD Fuel Oil)
PM_{10}	=	0.017 lbs/mmBtu	x	33.5 mmBtu/hr	=	0.57 lbs/hr (LSD Fuel Oil)
PM	=	0.015 lbs/mmBtu	x	33.5 mmBtu/hr	=	0.50 lbs/hr (LSD Fuel Oil)

Boiler EU13 at 29.291 mmBtu/hr (Not Low NO_x burners)

VOC	=	0.0055 lbs/mmBtu	x	29.291 mmBtu/hr	=	0.16 lbs/hr (Natural Gas)
SO_2	=	0.053 lbs/mmBtu	x	29.291 mmBtu/hr	=	1.55 lbs/hr (LSD Fuel Oil)
NO_x	=	0.159 lbs/mmBtu	x	29.291 mmBtu/hr	=	4.66 lbs/hr (Processed Fats)
CO	=	0.084 lbs/mmBtu	x	29.291 mmBtu/hr	=	2.46 lbs/hr (Natural Gas)
$PM_{2.5}$	=	0.012 lbs/mmBtu	x	29.291 mmBtu/hr	=	0.35 lbs/hr (LSD Fuel Oil)
PM_{10}	=	0.017 lbs/mmBtu	x	29.291 mmBtu/hr	=	0.50 lbs/hr (LSD Fuel Oil)
PM	=	0.015 lbs/mmBtu	x	29.291 mmBtu/hr	=	0.44 lbs/hr (LSD Fuel Oil)

Boiler EU10 at 63 mmBtu/hr (Low NO_x burners)

VOC	=	0.0055 lbs/mmBtu	x	63 mmBtu/hr	=	0.35 lbs/hr (Natural Gas)
SO_2	=	0.053 lbs/mmBtu	x	63 mmBtu/hr	=	3.34 lbs/hr (LSD Fuel Oil)
NO_x	=	0.159 lbs/mmBtu	x	63 mmBtu/hr	=	10.02 lbs/hr (Processed Fats)
CO	=	0.038 lbs/mmBtu	x	63 mmBtu/hr	=	2.39 lbs/hr (Biodiesel)
$PM_{2.5}$	=	0.012 lbs/mmBtu	x	63 mmBtu/hr	=	0.76 lbs/hr (LSD Fuel Oil)
PM_{10}	=	0.017 lbs/mmBtu	x	63 mmBtu/hr	=	1.07 lbs/hr (LSD Fuel Oil)
PM	=	0.015 lbs/mmBtu	x	63 mmBtu/hr	=	0.95 lbs/hr (LSD Fuel Oil)

RTO EU04 Burner at 3 mmBtu/hr (Not Low NO_x burner)

VOC	=	NA*				
SO_2	=	NA*				
NO_x	=	0.1000 lbs/mmBtu	x	3.0 mmBtu/hr	=	0.30 lbs/hr (Natural Gas)
CO	=	0.0840 lbs/mmBtu	x	3.0 mmBtu/hr	=	0.25 lbs/hr (Natural Gas)
$PM_{2.5}$	=	NA*				
PM_{10}	=	NA*				
PM	=	NA*				

*VOC, SO_2, and PM combustion emissions from RTO EU04 Burner already included in process VOC, SO_2, and PM species emissions from RTO EU04 Burner as tested during performance tests at the Butler facility.

TABLE V
Maximum Unrestricted Rendering Facility Combustion PTE Summary
Boilers EU02, EU10, EU13 & EU04 Burner (Combined)
Maximum Emission Rates (Worse Case Fuel) Annual Emissions

	All Boilers & EU04's Burner	
Pollutant	**lbs/hr**	**tpy**
VOC	0.69	3.02
SO_2	6.67	29.21
NO_x	20.31	88.96
CO	7.91	34.65
$PM_{2.5}$	1.86	8.15
PM_{10}	2.14	9.37
PM	1.89	8.28

Diesel-Fired RICE EU09

All of the EFs presented below (bullet) for the Rendering facility's diesel-fired RICE powering the plant office and corporate laboratory have been previously presented to and accepted by the KDEP in previous permitting iterations for the facility; Darling therefore simply recapitulates for the KDEP.

- The diesel-fired RICE EU09 at the facility provides emergency backup power for the plant office and corporate laboratory. Although there is no limit on the use of the emergency RICE generator in emergency situations, Darling does not anticipate the annual usage to exceed 500 hours; therefore, PTE emissions are calculated using 500 hours per year. Darling utilized AP-42 EFs from Chapter 3.3 – Gasoline and Diesel Industrial Engines for PM, VOC, SO_2, CO, and NO_x emissions for diesel-fired units (Table 3.3-1). According to footnote "b" to AP-42 Table 3.3-1, all PM is assumed to be less than 1 micron in size. A summary of the EFs used for the diesel-fired RICE EU09 is provided in Table VI.

TABLE VI
Diesel-Fired RICE EU09 Combustion Emission Factors – HHV (lbs/mmBtu) Based

	Diesel
VOC	0.35
SO_2	0.29
NO_x	4.41
CO	0.95
$PM_{2.5}$	0.31
PM_{10}	0.31
PM	0.31

The maximum PTE (in lbs/hr) for each criteria pollutant by fuel are calculated below and tabulated in Table VII using the maximum rated heat input for the diesel-fired RICE EU09 and EFs identified in Table VI.

Diesel-Fired RICE EU09 at 277 HP (or 1.939 mmBtu/hr)

VOC = 0.35 lbs/mmBtu x 1.939 mmBtu/hr = 0.68 lbs/hr
SO_2 = 0.29 lbs/mmBtu x 1.939 mmBtu/hr = 0.56 lbs/hr
NO_x = 4.41 lbs/mmBtu x 1.939 mmBtu/hr = 8.55 lbs/hr
CO = 0.95 lbs/mmBtu x 1.939 mmBtu/hr = 1.84 lbs/hr
$PM_{2.5}$ = 0.31 lbs/mmBtu x 1.939 mmBtu/hr = 0.60 lbs/hr
PM_{10} = 0.31 lbs/mmBtu x 1.939 mmBtu/hr = 0.60 lbs/hr
PM = 0.31 lbs/mmBtu x 1.939 mmBtu/hr = 0.60 lbs/hr

TABLE VII
Maximum Restricted Combustion PTE Summary
Diesel-Fired RICE EU09
Maximum Emission Rates and Annual Emissions

	Diesel-Fired RICE EU09 @ 500 hrs/yr	
Pollutant	**lbs/hr**	**tpy**
VOC	0.68	0.04
SO_2	0.56	0.03
NO_x	8.55	0.49
CO	1.84	0.11
$PM_{2.5}$	0.60	0.03
PM_{10}	0.60	0.03
PM	0.60	0.03

<u>Bakery Combustion Discussion</u>

TABLE VIII
Bakery Facility Combustion Units

Equipment	Manufacturer	Permitted Heat Input
Biomass Burner EU06	Energy Unlimited	22.5 mmBtu/hr
Diesel-Fired RICE EU11 (Powering Grinder EU12)	Caterpillar	3.26 mmBtu/hr

Biomass Burner EU06

The biomass burner (EU06) is currently permitted to combust natural gas, packaging materials fuel, sawdust, and peanut shells/hulls.

All of the EFs presented below (bullet) for facility combustion units have been previously presented to and accepted by the KDEP in previous permitting iterations for the facility; Darling therefore simply recapitulates for the KDEP.

- The combustion PTE for natural gas from biomass burner EU06 have been calculated using EPA AP-42[2] EFs for external combustion sources with less than 100 mmBtu/hr heat input in AP-42, Chapter 1.4 – Natural Gas Combustion. The combustion PTE for packaging materials fuel, sawdust, and peanut shells/hulls from Biomass Burner EU06 have been calculated using EPA AP-42 EFs for dry wood combustion in AP-42, Chapter 1.6 – Wood Residue Combustion.

A summary of the EFs used for the facility biomass burner EU06 is provided in Table IX.

TABLE IX
Bakery Facility Combustion Emission Factors – HHV (lbs/mmBtu) Based

	Natural Gas	Packaging Materials Fuel	Sawdust	Peanut Shells/Hulls
VOC	0.0055	**<u>0.017</u>**	**<u>0.017</u>**	**<u>0.017</u>**
SO_2	0.0006	**<u>0.025</u>**	**<u>0.025</u>**	**<u>0.025</u>**
NO_x	0.1000	**<u>0.49</u>**	**<u>0.49</u>**	**<u>0.49</u>**
CO	0.0840	**<u>0.60</u>**	**<u>0.60</u>**	**<u>0.60</u>**
$PM_{2.5}$	0.0076	**<u>0.31</u>**	**<u>0.31</u>**	**<u>0.31</u>**
PM_{10}	0.0076	**<u>0.36</u>**	**<u>0.36</u>**	**<u>0.36</u>**
PM	0.0076	**<u>0.40</u>**	**<u>0.40</u>**	**<u>0.40</u>**

The EFs from the fuel resulting in the highest emissions per unit of heat input are highlighted in **bold** and <u>underlined</u> text in Table IX for use in the biomass burner PTE determinations. The maximum PTE (in lbs/hr) for each criteria pollutant by fuel are calculated below and tabulated in Table X using the maximum rated heat input for the biomass burner and worst case (highest) EFs identified in Table IX.

Biomass Burner EU06 at 22.5 mmBtu/hr

VOC = 0.017 lbs/mmBtu x 22.5 mmBtu/hr = 0.38 lbs/hr (Biomass Fuels)
SO_2 = 0.025 lbs/mmBtu x 22.5 mmBtu/hr = 0.56 lbs/hr (Biomass Fuels)
NO_x = 0.490 lbs/mmBtu x 22.5 mmBtu/hr = 11.03 lbs/hr (Biomass Fuels)
CO = 0.600 lbs/mmBtu x 22.5 mmBtu/hr = 13.50 lbs/hr (Biomass Fuels)
$PM_{2.5}$ = 0.310 lbs/mmBtu x 22.5 mmBtu/hr = 6.98 lbs/hr (Biomass Fuels)
PM_{10} = 0.360 lbs/mmBtu x 22.5 mmBtu/hr = 8.10 lbs/hr (Biomass Fuels)
PM = 0.400 lbs/mmBtu x 22.5 mmBtu/hr = 9.00 lbs/hr (Biomass Fuels)

[2] US EPA AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources Chapter 1, Tables 1.4-1 and 1.4-2, last updated in July 1998

TABLE X
Maximum Unrestricted Bakery Facility Combustion PTE Summary
Biomass Burner EU06
Maximum Emission Rates and Unconstrained (Worse Case Fuel) Annual Emissions

	Biomass Burner EU06	
Pollutant	**lbs/hr**	**tpy**
VOC	0.38	1.66
SO_2	0.56	2.45
NO_x	11.03	48.31
CO	13.50	59.13
$PM_{2.5}$	6.98	30.57
PM_{10}	8.10	35.48
PM	9.00	39.42

Diesel-Fired RICE EU11

All of the EFs presented below (bullet) for the Bakery facility's diesel-fired RICE powering the bakery product "box" grinder have been previously presented to and accepted by the KDEP in previous permitting iterations for the facility; Darling therefore simply recapitulates for the KDEP.

- The RICE at Darling's Henderson, Kentucky, facility is also a Caterpillar 3406 series non-certified RICE. During the permitting for the Henderson RICE (2010), Darling received the emissions concentrations data from a Caterpillar representative. However, Darling can no longer locate the specific documentation of the emissions concentrations previously used and approved by the KDEP. However, during the permitting of the RICE at the Butler facility, the KDEP was amenable to using the previously provided Caterpillar information for the Henderson facility. The Butler RICE is 465 HP, slightly larger than the Henderson RICE at 425 HP. Thus, since the RICE at the Butler facility is also a Caterpillar 3406 series non-certified RICE and to remain consistent with previously permitted and KDEP approved emissions information, Darling used the emissions concentrations data from the Henderson facility permitting to calculate PTE emissions for the Butler facility RICE. The KDEP was amenable to using this information and applying a multiplier ratio (465 HP versus 425 HP) to develop adjusted PTE emissions for NO_x, VOC, CO, and PM species. For SO_2 PTE emissions calculations, Darling utilized the SO_2 EF from the EPA document AP-42, Chapter 3.3 Gasoline and Diesel Industrial Engines (SO_2 emissions data were not provided by Caterpillar). These emission rates and annual PTE emissions are populated below in Table XI.

TABLE XI
Maximum Unrestricted Combustion PTE Summary
Diesel-Fired RICE EU11
Maximum Emission Rates and Unconstrained Annual Emissions

	Diesel-Fired RICE EU11	
Pollutant	**lbs/hr**	**tpy**
VOC	0.348	1.52
SO_2	0.953	4.18
NO_x	7.344	32.17
CO	0.667	2.92
$PM_{2.5}$	0.132	0.58
PM_{10}	0.132	0.58
PM	0.132	0.58

V. Process Emissions Calculations

Rendering Process Discussion

Rendering Process Line EU04

The maximum potential process weight-rate of finished meal production for the rendering process line at the facility has been presented and technically supported to, and accepted by, the KDEP in previous permitting iterations. There are no changes; therefore, Darling does not wish to restate the method of calculation of this potential weight-rate. The potential weight-rate has been provided below in Table XII.

All of the EFs presented below (bullet) for the Bakery facility's diesel-fired RICE powering the bakery product "box" grinder have been previously presented to and accepted by the KDEP in previous permitting iterations for the facility; Darling therefore simply recapitulates for the KDEP.

Process Emissions- PM Species, SO_2, and VOC

- **PM Species**

Darling developed process EFs for filterable and condensable PM emissions using data from engineering emissions testing that were conducted at Butler on July 8, 2015. As has been done with other emissions test results, Darling utilized the controlled PM emissions test results (filterable and condensable) from the Butler facility and calculated a weight-rate based controlled EF. Darling divided the PM emissions rate of 0.395 lbs/hr by the finished meal production rate of 5.3 tons per hour (tph) measured during the test (0.395 lbs/hr ÷ 5.3 tph), which resulted in a controlled PM (filterable and condensable) weight-rate based EF of 0.075 pounds per ton (lbs/ton). Condensable emissions were observed to be 0.372 lbs/hr, which results in a weight-rate based controlled EF of 0.070 lbs/ton (0.372 lbs/hr ÷ 5.3 tph). Darling has used this emissions test as basis for the $PM_{2.5}$, PM_{10}, and total PM (or total PM_{10}) EFs for purposes of this application. Darling proposes to use the 0.075 lbs/ton EF for PM_{10} and total PM due to its understanding that condensable emissions are to be counted as $PM_{2.5}$ and PM_{10} and that all filterable PM emissions are filterable PM_{10} emissions. Darling proposes to use the 0.070 lbs/ton EF for $PM_{2.5}$ emissions as $PM_{2.5}$ is limited to only condensable emissions.

- **TRS/H_2S and SO_2**

Darling developed further SO_2 emissions data from compliance performance testing conducted at similar Darling operating facilities with RTOs controlling process emissions after becoming aware of the oxidation and subsequent conversion of Hydrogen Sulfide (H_2S) and other Total Reduced Sulfur (TRS) to SO_2 within the RTO combustion chamber. It was confirmed that process H_2S (or TRS) emissions from the high-intensity capture system, controlled by the RTO, are a precursor to SO_2 emissions from the RTO, due to the oxidation conversion of H_2S to SO_2. Thus, Darling conducted engineering emissions testing at the Butler facility on the exhaust of the RTO. Again, Darling monitored the production rate during this test and converted the SO_2 emission rate into a finished protein meal weight-rate based controlled EF (pursuant to EPA's AP-42 document that also provides EFs on a finished meal weight-rate basis). Darling divided the SO_2 emissions rate of 0.165 lbs/hr by the finished meal production rate of 5.3 tpy measured during the test (0.165 lbs/hr ÷ 5.3 tph), which resulted in a controlled SO_2 weight-rate based EF of 0.031 lbs/ton. Darling has used this emissions test as basis for the SO_2 EFs for purposes of this application.

- **VOC**

Darling developed EFs for VOC emissions using data from engineering emissions testing conducted at Butler on July 8, 2015. As has been done with other emissions test results, Darling utilized the controlled VOC emissions test results from the Butler facility and calculated a weight-rate based controlled EF. Darling divided the VOC emissions rate of 0.940 lbs/hr by the finished meal production rate of 5.3 tph measured during the test (0.940 lbs/hr ÷ 5.3 tph), which resulted in a controlled VOC weight-rate based EF of 0.177 lbs/ton. Darling has used this emissions test as basis for the VOC EFs for purposes of this application.

The controlled process PM species, SO_2, and VOC weight-rate EFs and the maximum potential finished meal process capacities at the facility have been used to determine weight-rate based process emissions in lbs/hr and PTE in tpy in Table XII.

TABLE XII
Rendering Facility Controlled SO_2, VOC, and PM Species Process PTE

Process Line	Finished Meal Max Potential	SO_2 PTE (0.031 lbs/ton)		VOC PTE (0.177 lbs/ton)		$PM_{2.5}$ PTE (0.07 lbs/ton)		PM_{10} PTE (0.075 lbs/ton)		PM PTE (0.075 lbs/ton)	
	tph	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
EU04	5.7	0.18	0.79	1.01	4.42	0.40	1.75	0.43	1.88	0.43	1.88

Bakery Process Discussion

Bakery Dryer Process EU06

PM and VOC emissions from the rotary dryer process EU06 are comingled with combustion emissions from the biomass burner and discharged out the dryer exhaust stack. VOC emissions in the dryer exhaust stack are highly variable and not conducive to establishing, or verifying, an emission rate based on a "snap shot" obtained by a stack test. To assure that emissions are in compliance with minor source emission limitations, the KDEP has previously agreed and continued to agree that VOC emissions may be calculated using the American Institute of Baking (AIB) formula on a monthly basis and totaled on a rolling twelve (12) month basis. This method has been successfully utilized for the multiple permit cycles. The facility previously requested, and has been operating under, a VOC synthetic limit of 90% of PSD threshold, or 225 tpy to avoid being classified as a major source under PSD.

The formula used by Darling is modeled after the AIB formula.

VOC EF = 0.95Y + 0.195T + 1.9, where
Y = Percent of yeast added to the dough by the bakery plant
T = Maximum proof time in hours (customer + Bakery Feeds)

This EF is calculated for each specific customer.

The equation above is then used to calculate actual VOC emissions as follows:

VOC emissions = VOC EF x DT x 0.0005
VOC EF = EF in lbs VOC/ton of yeasted dough
DT = tpy of yeasted dough
0.0005 = conversion from lbs to tons (tons/2,000 lbs)

Darling utilizes these equations to calculate VOC emissions from the drying process on a month by month basis and reports these emissions to the KDEP on a semiannual basis. Darling records and maintains the numbers used in the calculations at the plant site allowing the KDEP to verify the emissions rate at any time.

Allowable PM emissions, in lbs/hr from the drying process, are determined using the process weight rate calculation ($3.59(p)^{0.62}$ lbs/hr). With a process weight throughput of 27.1 tph (25 tph of raw materials and 2.1 tph of solid fuel), the allowable PM emission rate would be 27.77 lbs/hr. Actual PM emissions were determined to be 7.32 lbs/hr during the July 2015 emissions test; less than one half of the allowable emission rate. Though no test data is available, all PM emissions are continued to be assumed to be less than 10 micron in size. Therefore, PM PTE emissions are calculated using the 7.32 lbs/hr emission rate (7.32 lbs/hr x 8,760 hours/year ÷ 2000 lbs/ton = 32.06 tpy).

Product/Blending Stock mixing, Size Reduction, and Storage EU07

PM emissions from this process tend to be large sized particles with a high residual moisture content that quickly drop to the ground and do not remain airborne. Any emissions from this source would be fugitive emissions at the building egress points. There are no AP-42 EFs for this specific process. Darling has determined the most appropriate existing AP-42 EFs are those from Table 9.9.1-1 of AP-42, Chapter 9.9.1 – Grain Elevators and Processes for headhouse and grain handling. Darling conservatively estimates that the building enclosure provides a minimum of 85% control efficiency. The maximum PTE for each PM species is calculated by multiplying the maximum processing rate by the AP-42 EFs and then multiplying by the control inefficiency.

PM = 25 tph x 0.061 lb/ton x (100 – 85%) = 0.23 lb/hr
PM_{10} = 25 tph x 0.034 lb/ton x (100 – 85%) = 0.13 lb/hr
$PM_{2.5}$ = 25 tph x 0.0058 lb/ton x (100 – 85%) = 0.02 lb/hr

Therefore, PM PTE emissions are calculated using the above emission rates as follows:

PM = 0.23 lb/hr x 8,760 hours/year ÷ 2000 lbs/ton = 1.01 tpy
PM_{10} = 0.13 lb/hr x 8,760 hours/year ÷ 2000 lbs/ton = 0.57 tpy
$PM_{2.5}$ = 0.02 lb/hr x 8,760 hours/year ÷ 2000 lbs/ton = 0.09 tpy

Bakery Grinder EU12

Darling believes that no EPA AP-42 EFs have been published for this specific grinding operation. Chapter 9 of US EPA AP-42 – Food and Agricultural Industries, the Chapter most closely related to this operation, does not address grinding operations such as this. However, per the KDEP's recommendation, Darling has calculated PM species PTE emissions using EFs from US EPA AP-42, Chapter 9.9.1 Grain Elevators and Processes (Table 9.9.1-1 for Grain Handling); these EFs, in lb/ton of material, are presented in Table XIII below.

TABLE XIII
Bakery Grinder EU12 Emission Factors

	Grinder (EU-12)
$PM_{2.5}$	0.0058 lb/ton
PM_{10}	0.034 lb/ton
PM	0.061 lb/ton

Darling calculated the lbs/hr emission rates, using the EFs presented in Table XIII, to calculate the annual PTE for the bakery product grinder as presented below in Table XIV.

TABLE XIV
Bakery Grinder EU12 Maximum Unrestricted Grinder PTE Summary

	Grinder (EU-12)	
Pollutant	**lb/hr**	**tpy**
$PM_{2.5}$	0.12	0.53
PM_{10}	0.68	2.98
PM	1.22	5.34

VI. Facility-Wide Total (Combustion and Process) Emissions

Facility-wide process emission rates and PTE (from Tables XII and XIV) combined with facility-wide combustion emission rates and PTE (from Tables V, VII, X, and XI) are summarized in Table XV. The facility's VOC emissions are currently synthetically limited at 225 tpy allowing the facility to be classified as a Title V Source. The facility calculates actual emissions of VOC on a monthly and rolling 12-month basis to demonstrate compliance with the 225 tpy synthetic limit.

Greenhouse Gas (GHG) Emissions

No GHG emissions from process emissions were calculated, as none are known. By way of this application, Darling has updated the combustion GHG PTE calculations to remove residual fuel oils and on-spec used oil and revise distillate fuels to LSD fuel oil. Darling has determined that the worst-case scenario for combustion GHG PTE from the facility boilers is achieved by maximizing the combustion of processed fats (and/or biodiesel). Darling has also determined that the worst-case scenario for combustion GHG PTE from the facility biomass burner is achieved by maximizing the combustion of peanut shells/hulls. Additionally, Darling calculated the GHG PTE from the RTO burner (EU04), emergency generator (EU09) (at 500 hours), and diesel-fired RICE (EU11). The GHG PTE from all combustion sources is 122,557 short tpy carbon dioxide equivalent (CO_2e).

TABLE XV – Maximum Facility-Wide Potential (Controlled) Emissions Totals [a]

	VOC		SO_2		NO_x		CO		$PM_{2.5}$		PM_{10}		PM	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Boiler EU02	0.18	0.79	1.78	7.80	5.33	23.35	2.81	12.31	0.40	1.75	0.57	2.50	0.50	2.19
RTO Burner EU04	NA	NA	NA	NA	0.30	1.31	0.25	1.10	NA	NA	NA	NA	NA	NA
Biomass Burner EU06	0.38	1.66	0.56	2.45	11.03	48.31	13.50	59.13	6.98	30.57	8.10	35.48	9.00	39.42
RICE EU09	0.68	0.04	0.56	0.03	8.55	0.49	1.84	0.11	0.60	0.03	0.60	0.03	0.60	0.03
Boiler EU10	0.35	1.53	3.34	14.63	10.02	43.88	2.39	10.47	0.76	3.33	1.07	4.69	0.95	4.16
RICE EU11	0.348	1.52	0.953	4.18	7.344	32.17	0.667	2.92	0.132	0.58	0.132	0.58	0.132	0.58
Boiler EU13	0.16	0.70	1.55	6.79	4.66	20.41	2.46	10.77	0.35	1.53	0.50	2.19	0.44	1.93
Total Combustion Emissions	2.10	6.24	8.74	35.88	47.23	169.92	23.92	96.81	9.22	37.79	10.97	45.47	11.62	48.31
Rendering Process EU 04	1.01	4.42	0.18	0.79	NA	NA	NA	NA	0.40	1.75	0.43	1.88	0.43	1.88
Bakery Process EU06	Varies	Varies	NA	NA	NA	NA	NA	NA	7.32	32.06	7.32	32.06	7.32	32.06
Bakery Blending EU07	NA	NA	NA	NA	NA	NA	NA	NA	0.02	0.09	0.13	0.57	0.23	1.01
Total Process Emissions	Varies	Varies	0.18	0.79	NA	NA	NA	NA	7.74	33.90	7.88	34.51	7.98	34.95
Unrestricted Totals (Unlimited)	Varies	Varies	8.92	36.67	47.23	169.92	23.92	96.81	16.96	71.69	18.85	79.98	19.60	83.26
Totals (Limited)[a]	**Varies**	**≤225**	**8.92**	**36.67**	**47.23**	**169.92**	**23.92**	**96.81**	**16.96**	**71.69**	**18.85**	**79.98**	**19.60**	**83.26**

[a] VOC synthetically limited to 225 tpy.

DARLING INGREDIENTS INC.

APPLICATION FOR TITLE V RENEWAL & MODIFICATIONS

BUTLER, KENTUCKY

KDEP APPLICATION FORMS

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

___ Additional Documentation attached

Source Name: **Darling Ingredients Inc.**

KY EIS (AFS) #: **21- 191-00007**

Permit #: **V-19-023**

Agency Interest (AI) ID: **3408**

Date: **5/6/2025**

Section AI.1: Source Information

Physical Location Address:	**Street:**	1176 Bryan Griffin Road				
	City:	Butler	**County:**	Pendleton	**Zip Code:**	41006
Mailing Address:	**Street or P.O. Box:**	4221 Alexandria Pike				
	City:	Cold Spring	**State:**	KY	**Zip Code:**	41076

Standard Coordinates for Source Physical Location

Longitude: -84.404064 (decimal degrees) **Latitude:** 38.730853 (decimal degrees)

Primary (NAICS) Category: Rendering and Meat Byproduct Processing **Primary NAICS #:** 311613

#

Classification (SIC) Category: Animal and Marine Fats and Oils **Primary SIC #:** 2077

Briefly discuss the type of business conducted at this site: The facility recycles inedible animal byproducts and bakery materials into ingredients used in the manufacturing of animal feed.

Description of Area Surrounding Source:
- ☑ Rural Area
- ☐ Urban Area
- ☐ Industrial Park
- ☑ Industrial Area
- ☐ Residential Area
- ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 86

Approximate distance to nearest residence or commercial property: *0.5 miles*

Property Area: **Approx. 518 acres**

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:
- ☐ Mixed Waste Generator
- ☐ Generator
- ☐ Recycler
- ☐ Other: ______________
- ☐ U.S. Importer of Hazardous Waste
- ☐ Transporter
- ☐ Treatment/Storage/Disposal Facility
- ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Darling Ingredients Inc.

Title: (if individual)

Mailing Address:
Street or P.O. Box: 4221 Alexandria Pike
City: Cold Spring **State:** KY **Zip Code:** 41076

Email: (if individual)

Phone: (859) 781-2010

Technical Contact

Name: Kelly Thomas

Title: Director of Environmental Affairs

Mailing Address:
Street or P.O. Box: 4221 Alexandria Pike
City: Cold Spring **State:** KY **Zip Code:** 41076

Email: cteastenv@darlingii.com

Phone: (859) 572-2591

Air Permit Contact for Source

Name: Brad Eden

Title: General Manager

Mailing Address:
Street or P.O. Box: 1176 Bryan Griffin Road
City: Butler **State:** KY **Zip Code:** 41006

Email: Brad.Eden@darlingii.com

Phone: (859) 472-7361

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: ____________________

Title: ____________________

Mailing Address: **Street or P.O. Box:** ____________________
City: __________ **State:** __________ **Zip Code:** __________

Email: ____________________

Phone: ____________________

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position
Randy Stuewe	Chief Executive Officer

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☑ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☐ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: ____________

Is the source requesting a limitation of potential emissions? ☑ Yes ☐ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☑ Volatile Organic Compounds (VOC)	225	☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* NA

Proposed Operation Start-Up Date: *(MM/YYYY)* NA

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* NA

Proposed Operation Start-Up Date: *(MM/YYYY)* NA

Applicant is seeking coverage under a permit shield. ☐ Yes ☑ No **Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.**

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- [x] DEP7007A Indirect Heat Exchangers and Turbines
- [x] DEP7007B Manufacturing or Processing Operations
- [ ] DEP7007C Incinerators and Waste Burners
- [ ] DEP7007F Episode Standby Plan
- [ ] DEP7007J Volatile Liquid Storage
- [ ] DEP7007K Surface Coating or Printing Operations
- [ ] DEP7007L Mineral Processes
- [ ] DEP7007M Metal Cleaning Degreasers
- [x] DEP7007N Source Emissions Profile
- [ ] DEP7007P Perchloroethylene Dry Cleaning Systems
- [ ] DEP7007R Emission Offset Credit
- [ ] DEP7007S Service Stations
- [ ] DEP7007T Metal Plating and Surface Treatment Operations
- [x] DEP7007V Applicable Requirements and Compliance Activities
- [ ] DEP7007Y Good Engineering Practice and Stack Height Determination
- [ ] DEP7007AA Compliance Schedule for Non-complying Emission Units
- [ ] DEP7007BB Certified Progress Report
- [ ] DEP7007CC Compliance Certification
- [x] DEP7007DD Insignificant Activities
- [x] DEP7007EE Internal Combustion Engines
- [ ] DEP7007FF Secondary Aluminum Processing
- [x] DEP7007GG Control Equipment
- [ ] DEP7007HH Haul Roads
- [ ] Confidentiality Claim
- [ ] Ownership Change Form
- [ ] Secretary of State Certificate
- [x] Flowcharts or diagrams depicting process
- [ ] Digital Line Graphs (DLG) files of buldings, roads, etc.
- [ ] Site Map
- [ ] Map or drawing depicting location of facility
- [ ] Safety Data Sheet (SDS)
- [ ] Emergency Response Plan
- [ ] Other: ____________________________

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

[signature]	4/24/2025
Authorized Signature	**Date**
Brandon Lachner	Regional Vice President
Type or Printed Name of Signatory	**Title of Signatory**

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007A

Indirect Heat Exchangers and Turbines

___ Section A.1: General Information
___ Section A.2: Operating and Fuel Information
___ Section A.3: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

____ Manufacturer's specifications

Source Name: **Darling Ingredients Inc.**
KY EIS (AFS) #: **21-191-00007**
Permit #: **V-19-023**
Agency Interest (AI) ID: **3408**
Date: **5/6/2025**

Section A.1: General Information

Emission Unit #	Emission Unit Name	Process ID	Process Name	Identify General Type: Indirect Heat Exchanger, Gas Turbine, or Combustion Turbine	Indirect Heat Exchanger Configuration	Manufacturer	Model No./ Serial No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	SCC Code	SCC Units	Control Device ID	Stack ID
EU02	Boiler EU02	EU02	Boiler EU02	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	N-193751	1973	10200602	mmscf	NA	EP02
EU02	Boiler EU02	EU02	Boiler EU02	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	N-193751	1973	10200501	1000 gallons Low Sulfur Diesel burned (No. 2)	NA	EP02
EU02	Boiler EU02	EU02	Boiler EU02	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	N-193751	1973	10201303	1000 gallons Processed Fats burned	NA	EP02
EU10	Boiler EU10	EU10	Boiler EU10	Indirect Heat Exchanger	Horizontally Opposed	Victory Energy	F3-1500-S250-G&Oil	11/20/2015	10200602	mmscf	NA	EP11
EU10	Boiler EU10	EU10	Boiler EU10	Indirect Heat Exchanger	Horizontally Opposed	Victory Energy	F3-1500-S250-G&Oil	11/20/2015	10200501	1000 gallons Low Sulfur Diesel burned (No. 2)	NA	EP11
EU10	Boiler EU10	EU10	Boiler EU10	Indirect Heat Exchanger	Horizontally Opposed	Victory Energy	F3-1500-S250-G&Oil	11/20/2015	10201303	1000 gallons Processed Fats burned	NA	EP11

				Identify General				Proposed/Actual				
EU13	Boiler EU13	EU13	Boiler EU13	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	CB400-700 / L-61633	12/20/2017	10200602	mmscf	NA	EP14
EU13	Boiler EU13	EU13	Boiler EU13	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	CB400-700 / L-61633	12/20/2017	10200501	1000 gallons Low Sulfur Diesel burned (No. 2)	NA	EP14
EU13	Boiler EU13	EU13	Boiler EU13	Indirect Heat Exchanger	Horizontally Opposed	Cleaver Brooks	CB400-700 / L-61633	12/20/2017	10201303	1000 gallons Processed Fats burned	NA	EP14

Section A.2: Operating and Fuel Information

Emission Unit #	If multipurpose unit, identify the percentage of use by purpose				Rated Capacity Heat Input (MMBTU/hr)	Rated Capacity Power Output		Describe Operating Scenario (only if this unit will be used in different configurations)	Classify Fuel as Primary or Secondary	Identify Fuel Type: Coal, Natural Gas, Wood, Biomass, Landfill/Digester Gas, Fuel Oil # (specify 1-6), or Other	Heat Content (HHV)		Maximum Operating Hours	Ash Content (%)	Sulfur Content (%)
	Space Heat	Process Heat	Power	Emergency			(Specify units: hp, MW, or lb steam/hr)					(Specify units: Btu/lb, Btu/gal, or Btu/scf)			
EU02		100			33.479	800	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Primary	Natural Gas	1,000	Btu/scf	8760	0	0
EU02		100			33.479	800	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Low Sulfur Diesel	133,650	Btu/gal	8760	0	<0.05%
EU02		100			33.479	800	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Processed Fats	125,900	Btu/gal	8760	0	0
EU02		100			33.479	800	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Biodiesel	122,400	Btu/gal	8760	0	0
EU10		100			62.773	1500	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Primary	Natural Gas	1,000	Btu/scf	8760	0	0
EU10		100			62.773	1500	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Low Sulfur Diesel	133,650	Btu/gal	8760	0	<0.05%
EU10		100			62.773	1500	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Processed Fats	125,900	Btu/gal	8760	0	0
EU10		100			62.773	1500	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Biodiesel	122,400	Btu/gal	8760	0	0
EU13		100			29.291	700	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Primary	Natural Gas	1,000	Btu/scf	8760	0	0
EU13		100			29.291	700	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Low Sulfur Diesel	133,650	Btu/gal	8760	0	<0.05%

Emission	If multipurpose unit, identify the percentage of use by purpose				Rated Capacity	Rated Capacity Power Output		Describe Operating Scenario	Classify Fuel as	Identify Fuel Type: Coal, Natural Gas, Wood,	Heat Content (HHV)		Maximum	Ash	Sulfur
EU13		100			29.291	700	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Processed Fats	125,900	Btu/gal	8760	0	0
EU13		100			29.291	700	HP	Classified as Natural Gas-Fired Boiler under 40 CFR 63, Subpart JJJJ,	Secondary	Biodiesel	122,400	Btu/gal	8760	0	0

Section A.3: Notes, Comments, and Explanations
NA

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007B

Manufacturing or Processing Operations

___ Section B.1: Process Information
___ Section B.2: Materials and Fuel Information
___ Section B.3: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.
___ Attach a flow diagram
___ Attach SDS

Source Name: Darling Ingredients Inc.
KY EIS (AFS) #: 21- 191-00007
Permit #: V-19-023
Agency Interest (AI) ID: 3408
Date: 5/6/2025

Section B.1: Process Information

Emission Unit #	Emission Unit Name	Describe Emission Unit	Process ID	Process Name	Manufacturer	Model No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Is the Process Continuous or Batch?	Number of Batches per 24 Hours *(if applicable)*	Hours per Batch *(if applicable)*
EU04	Rendering Process Line	**See Narrative	EU04	Rendering Processes	Custom designed by Darling Ingredients Inc.	Custom designed by Darling Ingredients Inc.	07/1983	Continuous	NA	NA
EU06	Biomass Burner/Dryer	**See Narrative	EU06	Biomass Burner/Dryer	Custom designed by Darling Ingredients Inc.	Custom designed by Darling Ingredients Inc.	08/1998	Continuous	NA	NA
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	**See Narrative	EU07	Product/Blending Stock mixing, Size Reduction, and Storage	Custom designed by Darling Ingredients Inc.	Custom designed by Darling Ingredients Inc.	08/1998	Continuous	NA	NA
EU12	Bakery Product Box Grinder	**See Narrative	EU12	Bakery Product Box Grinder	Caterpillar		2017	Batch	1	24

Emission Unit #	Emission Unit Name	Describe Emission Unit	Process ID	Process Name	Manufacturer	Model No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Is the Process Continuous or Batch?	Number of Batches per 24 Hours *(if applicable)*	Hours per Batch *(if applicable)*

Section B.2: Materials and Fuel Information

**Maximum yearly fuel usage rate only applies if applicant request operating restrictions through federally enforceable limitations.*

Emission Unit #	Emission Unit Name	Name of Raw Materials Input	Maximum Quantity of Each Raw Material Input		Total Process Weight Rate for Emission Unit *(tons/hr)*	Name of Finished Materials	Maximum Quantity of Each Finished Material Output		Fuel Type	Maximum Hourly Fuel Usage Rate		Maximum Yearly Fuel Usage Rate		Sulfur Content *(%)*	Ash Content *(%)*
				(Specify Units/hr)				*(Specify Units/hr)*			*(Specify Units)*		*(Specify Units)*		
EU04	Rendering Process	Inedible animal by-products and restaurant food grease.	**See B.3.		**See B.3.	Meat Meal	5.7	tons	NA	NA	NA	NA	NA	NA	NA
EU04	Rendering Process	Inedible animal by-products and restaurant food grease.	**See B.3.		**See B.3.	Processed Fats	**See B.3.		NA	NA	NA	NA	NA	NA	NA
EU06	Biomass Burner/Dryer	Natural Gas	18	MCF/hr	25	Cookie Meal	Cookie Meal	tons/hr	Natural Gas	18	MCF/hr	158	MMCF/yr	0	0
EU06	Biomass Burner/Dryer	Sawdust/Peanut Biomass	1.41	tons/hr	25	Cookie Meal	Cookie Meal	tons/hr	Biomass	1.41	tons/hr	12352	tons/yr	0	1.4
EU06	Biomass Burner/Dryer	Paper & Packaging	0.9	tons/hr	25	Cookie Meal	Cookie Meal	tons/hr	Paper/ Packaging	0.9	tons/hr	7884	tons/yr	0	4.5
EU06	Biomass Burner/Dryer	Bakery By-products	25	tons/hr	25	Cookie Meal	Cookie Meal	tons/hr	NA	NA	NA	NA	NA	NA	NA
EU06	Biomass Burner/Dryer	Blending stock	6.25	tons/hr	25	Cookie Meal	Cookie Meal	tons/hr	NA	NA	NA	NA	NA	NA	NA
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	Blending stock mixed with dried product	25	tons/hr	25	Cookie Meal	25	tons/hr	NA	NA	NA	NA	NA	NA	NA
EU12	Bakery Product Box Grinder	Boxed Bakery Materials	20	tons/hr	20	1) Ground Bakery Materials 2) Assorted Packaging Materials	1) 19.75 2) 0.25	tons/hr	NA (See DEP Form 7007N for RICE Engine Data)	NA	NA	NA	NA	NA	NA

Section B.3: Notes, Comments, and Explanations
Production of finished products (meat meal, feather meal and processed fats) is accomplished by removing moisture from raw materials. Accordingly, raw material moisture content is the "limiting factor" for production. As moisture content varies greatly depending on the raw material being utilized, it is not feasible to set a specific maximum quantity input potential for these raw materials.

Division for Air Quality

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DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary
__ Section N.2: Stack Information
__ Section N.3: Fugitive Information
__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

__ Complete DEP7007AI

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Date: **5/6/2025**

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency (%)	Hourly Emissions: Uncontrolled Potential (lb/hr)	Hourly Emissions: Controlled Potential (lb/hr)	Annual Emissions: Uncontrolled Potential (tons/yr)	Annual Emissions: Controlled Potential (tons/yr)
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	PM	7.6	AP-42	0.00%	0.00%	0.25		1.12	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	PM_{10}	7.6	AP-42	0.00%	0.00%	0.25		1.12	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	$PM_{2.5}$	7.6	AP-42	0.00%	0.00%	0.25		1.12	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	VOC	5.5	AP-42	0.00%	0.00%	0.180		0.81	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	SO_2	0.6	AP-42	0.00%	0.00%	0.0200		0.090	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	NO_x	100	AP-42	0.00%	0.00%	0.64		2.79	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.033500	CO	84	AP-42	0.00%	0.00%	0.020		0.09	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	PM	2	AP-42	0.00%	0.00%	0.50		2.20	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	PM_{10}	2.3	AP-42	0.00%	0.00%	0.58		2.53	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	$PM_{2.5}$	1.55	AP-42	0.00%	0.00%	0.39		1.70	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	VOC	0.2	AP-42	0.00%	0.00%	0.050		0.220	

EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	SO_2	7.1**	AP-42	0.00%	0.00%	1.78		7.79	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	NO_x	20	AP-42	0.00%	0.00%	5.01		21.96	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.250655	CO	5	AP-42	0.00%	0.00%	1.25		5.49	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	PM	1.259	Stack Test	0.00%	0.00%	0.32		1.39	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	PM_{10}	1.259	Stack Test	0.00%	0.00%	0.32		1.39	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	SO_2	0.038	Stack Test	0.00%	0.00%	0.0100		0.0400	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	NO_x	20	Stack Test	0.00%	0.00%	5.48		24.00	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.266084	CO	2.81	Stack Test	0.00%	0.00%	0.77		3.37	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	PM	0.46	Stack Test	0.00%	0.00%	0.13		0.55	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	PM_{10}	0.46	Stack Test	0.00%	0.00%	0.13		0.55	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	SO_2	0	Stack Test	0.00%	0.00%	0.0000		0.0000	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	NO_x	14.91	Stack Test	0.00%	0.00%	4.08		17.87	
EU02	Boiler EU02	EU02	Boiler EU02	NA	NA	EP02	0.273693	CO	4.62	Stack Test	0.00%	0.00%	1.26		5.54	
EU04	Rendering Process Line	EU04	Rendering Process Line	RTO	NA	EP05	5.70	SO_2	NA	Stack Test	0.00%	0.00%		0.18		0.79
EU04	Rendering Process Line	EU04	Rendering Process Line	RTO	NA	EP05	5.70	$PM_{2.5}$	NA	Stack Test	0.00%	0.00%		0.4		1.75
EU04	Rendering Process Line	EU04	Rendering Process Line	RTO	NA	EP05	5.70	PM_{10}	NA	Stack Test	0.00%	0.00%		0.43		1.88
EU04	Rendering Process Line	EU04	Rendering Process Line	RTO	NA	EP05	5.70	PM	NA	Stack Test	0.00%	0.00%		0.43		1.88
EU04	Rendering Process Line	EU04	Rendering Process Line	RTO	NA	EP05	5.70	VOC	NA	Stack Test	0.00%	98.00%		1.01		4.42
EU05	RTO	EU05	RTO	RTO	NA	EP05	0.003	NO_x	100	AP-42	0.00%	0.00%	0.057		2.25	
EU05	RTO	EU05	RTO	RTO	NA	EP05	0.003	CO	84	AP-42	0.00%	0.00%	0.002		0.01	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	PM	7.6	AP-42	0.00%	0.00%	0.17		0.75	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	PM_{10}	7.6	AP-42	0.00%	0.00%	0.17		0.75	

EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	$PM_{2.5}$	7.6	AP-42	0.00%	0.00%	0.17		0.75	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	VOC	5.5	AP-42	0.00%	0.00%	0.120		0.54	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	SO_2	0.6	AP-42	0.00%	0.00%	0.0100		0.060	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	NO_x	100	AP-42	0.00%	0.00%	2.25		9.86	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	0.022500	CO	84	AP-42	0.00%	0.00%	1.890		8.28	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	PM	0.4	AP-42	0.00%	0.00%	9.00		39.42	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	PM_{10}	0.36	AP-42	0.00%	0.00%	8.10		35.48	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	$PM_{2.5}$	0.31	AP-42	0.00%	0.00%	6.98		30.55	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	VOC	0.017	AP-42	0.00%	0.00%	0.380		1.68	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	SO_2	0.025	AP-42	0.00%	0.00%	0.5600		2.460	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	NO_x	0.49	AP-42	0.00%	0.00%	11.03		48.29	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.170000	CO	0.6	AP-42	0.00%	0.00%	13.500		59.13	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	PM	0.4	AP-42	0.00%	0.00%	9.00		39.42	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	PM_{10}	0.36	AP-42	0.00%	0.00%	8.10		35.48	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	$PM_{2.5}$	0.31	AP-42	0.00%	0.00%	6.98		30.55	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	VOC	0.017	AP-42	0.00%	0.00%	0.380		1.68	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	SO_2	0.025	AP-42	0.00%	0.00%	0.5600		2.460	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	NO_x	0.49	AP-42	0.00%	0.00%	11.03		48.29	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	1.290000	CO	0.6	AP-42	0.00%	0.00%	13.500		59.13	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	PM	0.4	AP-42	0.00%	0.00%	9.00		39.42	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	PM_{10}	0.36	AP-42	0.00%	0.00%	8.10		35.48	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	$PM_{2.5}$	0.31	AP-42	0.00%	0.00%	6.98		30.55	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	VOC	0.017	AP-42	0.00%	0.00%	0.380		1.68	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	SO_2	0.025	AP-42	0.00%	0.00%	0.5600		2.460	

EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	NO_x	0.49	AP-42	0.00%	0.00%	11.03		48.29	
EU06	Biomass Burner/Dryer	EU06	Biomass Burner/Dryer	NA	NA	EP07	2.730000	CO	0.6	AP-42	0.00%	0.00%	13.500		59.13	
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	EU07	Product/Blending Stock mixing, Size Reduction, and Storage	NA	NA	EP08	25.000000	PM	0.061	AP-42	0.00%	15.00%		0.23		1.1
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	EU07	Product/Blending Stock mixing, Size Reduction, and Storage	NA	NA	EP08	25.000000	PM_{10}	0.034	AP-42	0.00%	15.00%		0.13		0.57
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	EU07	Product/Blending Stock mixing, Size Reduction, and Storage	NA	NA	EP08	25.000000	$PM_{2.5}$	0.0058	AP-42	0.00%	15.00%		0.02		0.09
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	PM	41.43	AP-42	0.00%	0.00%	0.6		0.03*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	PM_{10}	41.43	AP-42	0.00%	0.00%	0.6		0.03*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	$PM_{2.5}$	41.43	AP-42	0.00%	0.00%	0.6		0.03*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	VOC	46.78	AP-42	0.00%	0.00%	0.68		0.04*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	SO_2	38.76	AP-42	0.00%	0.00%	0.56		0.03*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	NO_x	589.4	AP-42	0.00%	0.00%	8.55		0.49*	
EU09	Emergency RICE	EU09	Emergency Rice EU09	NA	NA	EP10	0.01451	CO	126.97	AP-42	0.00%	0.00%	1.84		0.11*	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	PM	7.6	AP-42	0.00%	0.00%	0.48		2.09	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	PM_{10}	7.6	AP-42	0.00%	0.00%	0.48		2.09	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	$PM_{2.5}$	7.6	AP-42	0.00%	0.00%	0.48		2.09	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	VOC	5.5	AP-42	0.00%	0.00%	0.350		1.51	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	SO_2	0.6	AP-42	0.00%	0.00%	0.0400		0.160	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	NO_x	19	AP-42	0.00%	0.00%	6.28		27.49	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.062773	CO	0.6	AP-42	0.00%	0.00%	5.270		23.10	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	PM	2	AP-42	0.00%	0.00%	0.94		4.11	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	PM_{10}	2.3	AP-42	0.00%	0.00%	1.08		4.73	

EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	$PM_{2.5}$	1.55	AP-42	0.00%	0.00%	0.73		3.19	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	VOC	0.2	AP-42	0.00%	0.00%	0.090		0.410	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	SO_2	7.1**	AP-42	0.00%	0.00%	3.33		14.61	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	NO_x	20	AP-42	0.00%	0.00%	9.39		41.14	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.469682	CO	5	AP-42	0.00%	0.00%	2.35		10.29	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	PM	1.259	Stack Test	0.00%	0.00%	0.59		2.61	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	PM_{10}	1.259	Stack Test	0.00%	0.00%	0.59		2.61	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	SO_2	0.038	Stack Test	0.00%	0.00%	0.0200		0.0800	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	NO_x	20	Stack Test	0.00%	0.00%	10.27		44.97	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.498594	CO	2.81	Stack Test	0.00%	0.00%	1.44		6.31	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	PM	0.46	Stack Test	0.00%	0.00%	0.24		1.03	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	PM_{10}	0.46	Stack Test	0.00%	0.00%	0.24		1.03	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	SO_2	0	Stack Test	0.00%	0.00%	0.0000		0.0000	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	NO_x	14.91	Stack Test	0.00%	0.00%	7.65		33.49	
EU10	Boiler EU10	EU10	Boiler EU10	NA	NA	EP11	0.512851	CO	4.62	Stack Test	0.00%	0.00%	2.37		10.38	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	PM	0.31	AP-42	0.00%	0.00%	0.132		0.58	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	PM_{10}	0.31	AP-42	0.00%	0.00%	0.132		0.58	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	$PM_{2.5}$	0.31	AP-42	0.00%	0.00%	0.132		0.58	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	VOC	0.35	AP-42	0.00%	0.00%	0.348		1.52	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	SO_2	0.29	AP-42	0.00%	0.00%	0.953		4.18	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	NO_x	4.41	AP-42	0.00%	0.00%	7.344		32.17	
EU11	Emergency RICE	EU11	Emergency Rice EU11	NA	NA	EP12	0.02439	CO	0.95	AP-42	0.00%	0.00%	0.667		2.92	

EU12	Bakery Product Box Grinder	EU12	Bakery Product Box Grinder	NA	NA	EP13	20.000000	PM	0.061	AP-42	0.00%	0.00%	1.22		5.34	
EU12	Bakery Product Box Grinder	EU12	Bakery Product Box Grinder	NA	NA	EP13	20.000000	PM_{10}	0.034	AP-42	0.00%	0.00%	0.68		2.98	
EU12	Bakery Product Box Grinder	EU12	Bakery Product Box Grinder	NA	NA	EP13	20.000000	$PM_{2.5}$	0.0058	AP-42	0.00%	0.00%	0.12		0.53	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	PM	7.6	AP-42	0.00%	0.00%	0.22		0.98	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	PM_{10}	7.6	AP-42	0.00%	0.00%	0.22		0.98	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	$PM_{2.5}$	7.6	AP-42	0.00%	0.00%	0.22		0.98	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	VOC	5.5	AP-42	0.00%	0.00%	0.160		0.71	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	SO_2	0.6	AP-42	0.00%	0.00%	0.0200		0.080	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	NO_x	100	AP-42	0.00%	0.00%	0.56		2.44	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.029291	CO	84	AP-42	0.00%	0.00%	0.020		0.08	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	PM	2	AP-42	0.00%	0.00%	0.44		1.92	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	PM_{10}	2.3	AP-42	0.00%	0.00%	0.50		2.21	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	$PM_{2.5}$	1.55	AP-42	0.00%	0.00%	0.34		1.49	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	VOC	0.2	AP-42	0.00%	0.00%	0.040		0.190	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	SO_2	7.1**	AP-42	0.00%	0.00%	1.56		6.82	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	NO_x	20	AP-42	0.00%	0.00%	4.38		19.20	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.219162	CO	5	AP-42	0.00%	0.00%	1.10		4.80	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	PM	1.259	Stack Test	0.00%	0.00%	0.28		1.22	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	PM_{10}	1.259	Stack Test	0.00%	0.00%	0.28		1.22	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	SO_2	0.038	Stack Test	0.00%	0.00%	0.0100		0.0400	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	NO_x	20	Stack Test	0.00%	0.00%	4.79		20.98	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.232653	CO	2.81	Stack Test	0.00%	0.00%	0.67		2.95	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	PM	0.46	Stack Test	0.00%	0.00%	0.11		0.48	

EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	PM_{10}	0.46	Stack Test	0.00%	0.00%	0.11		0.48	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	VOC	0	Stack Test	0.00%	0.00%	0.00		0.00	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	SO_2	0	Stack Test	0.00%	0.00%	0.0000		0.0000	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	NO_x	14.91	Stack Test	0.00%	0.00%	3.57		15.63	
EU13	Boiler EU13	EU13	Boiler EU13	NA	NA	EP14	0.239306	CO	4.62	Stack Test	0.00%	0.00%	1.11		4.84	
									* S=0.05						*Based on 500 hours of operation	

Section N.2: Stack Information

UTM Zone:

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(°F)*	Exit Velocity *(ft/sec)*
EP02	EU02 (Boiler EU02)	2	23		16S 4290159	725625	15079	500	80
EP05	EU04 (Rendering Process, Venturi/Packed Tower Scrubber/RTO)	2	43		16S 4290159	725625	3500	77	18.57
EP07	EU06 (Biomass Burner and Dryer)	4	100		16S 4290159	725625	48000	240	63.68
EP10	EU09 (Diesel Fired Emergency RICE)	0.42	7.75		16S 4290159	725625	1225	1046	147.37
EP11	EU10 (Boiler EU10)	2.5	36		16S 4290159	725625	113392	400	385
EP12	EU11 (Diesel Fired RICE)	0.4	11		NA	NA	3069	1004	407
EP14	EU13 (Boiler EU13)	2	23		16S 4290159	725625	15079	500	80

Section N.3: Fugitive Information

UTM Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature *(°F)*	Release Height *(ft)*
Remains unchanged								

Section N.4: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007V
Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requirements
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Darling Ingredients Inc.
KY EIS (AFS) #: 21- 191-00007
Permit #: V-19-023
Agency Interest (AI) II 3408
Date: 5/6/2025

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU02	Boiler EU02	402 KAR 60:005, Section 2(2)(d) (Subpart Dc)	SO_2	NA	NA	NA	Monitoring/Recordkeeping/ Reporting Requirements in current Permit
EU02	Boiler EU02	402 KAR 52:020	SO_2	NA	Low Sulfur Diesel sulfur content < 0.05 weight %	Low Sulfur Diesel sulfur content < 0.05% weight	Fuel supplier certification

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU02	Boiler EU02	40 CFR 63, Subart JJJJ	NA	NA	Use of liquid fuels restricted to times of natural gas curtailment, gas supply interruption, startups, or periodic testing	Unit classified as natural gas-fired boiler & exempt from requirements	Maintain records of time periods when & reason why liquid fuel is fired
EU02	Boiler EU02	40 CFR 60.42c(d)	SO_2	0.50 lb/MMBtu when burning liquid fuels	NA	NA	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU02	Boiler EU02	401 KAR 59:015, Section 5(1)(c)(2)	SO_2	1.37 lb/MMBtu when burning natural gas	NA	NA	Compliance is assumed while burning natural gas
EU02	Boiler EU02	40 CFR 60.43c	PM	NA	NA	Low Sulfur Diesel sulfur content $\leq$ 0.5 weight %, or mixture of 0.5 weight % with other fuels	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU02	Boiler EU02	401 KAR 59:015, Section 4	PM	0.36 lb/MMBtu based on 3-hr avg	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel
EU02	Boiler EU02	401 KAR 59:015, Section 4(2)(b) and (c)	Opacity	20%	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU02	Boiler EU02	40 CFR 60.43c(c)	Opacity	20%, except one 6-min period per hour of not more than 40%	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel
EU04	Rendering Process and Finished Product Handling	401 KAR 59:010, Section 3(1)	Opacity	20% based on 6-min avg	NA	NA	Method 9 observation
EU04	Rendering Process and Finished Product Handling	401 KAR 59:010, Section 3(2)	PM	2.34 lb/hr when operating at 1,000 lbs/hr or less	NA	NA	Compliance assumed base don the emission factor determined from most recent stack test.
EU04	Rendering Process and Finished Product Handling	401 KAR 53:010	Odor	Detectable odor when 1 unit of ambient air mixed with 7 units of odorless air	NA	NA	None
EU06	Biomass Burner/Dryer	401 KAR 59:010, Section 3(1)	Opacity	20% based on 6-min avg	NA	NA	Method 9 observation
EU06	Biomass Burner/Dryer	401 KAR 59:010, Section 3(2)	PM	2.34 lb/hr when operating at 1,000 lbs/hr or less	NA	NA	Compliance assumed base don the emission factor determined from most recent stack test.
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	401 KAR 59:010, Section 3(1)	Opacity	20% based on 6-min avg	NA	NA	Method 9 observation
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	401 KAR 59:010, Section 3(2)	PM	2.34 lb/hr when operating at 1,000 lbs/hr or less	NA	NA	Compliance assumed.
EU09	Emergency RICE	40 CFR 63, Subpart ZZZZ	NA	NA	NA	NA	Meet requirements of 40 CFR 60, Subpart JJJJ

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU10	Boiler EU10	402 KAR 60:005, Section 2(2)(d) (Subpart Dc)	SO_2	NA	NA	NA	Monitoring/Recordkeeping/ Reporting Requirements in current Permit
EU10	Boiler EU10	402 KAR 52:020	SO_2	NA	Low Sulfur Diesel sulfur content $\leq$ 0.05 weight %	Low Sulfur Diesel sulfur content $\leq$ 0.05% weight	Fuel supplier certification
EU10	Boiler EU10	40 CFR 63, Subart JJJJ	NA	NA	Use of liquid fuels restricted to times of natural gas curtailment, gas supply interruption, startups, or periodic testing	Unit classified as natural gas-fired boiler & exempt from requirements	Maintain records of time periods when & reason why liquid fuel is fired
EU10	Boiler EU10	40 CFR 60.42c(d)	SO_2	0.50 lb/MMBtu when burning liquid fuels	NA	NA	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU10	Boiler EU10	401 KAR 59:015, Section 5(1)(c)(2)	SO_2	1.05 lb/MMBtu when burning natural gas	NA	NA	Compliance is assumed while burning natural gas
EU10	Boiler EU10	40 CFR 60.43c	PM	NA	NA	Low Sulfur Diesel sulfur content $\leq$ 0.5 weight %, or mixture of 0.5 weight % with other fuels	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU10	Boiler EU10	401 KAR 59:015, Section 4	PM	0.30 lb/MMBtu based on 3-hr avg	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU10	Boiler EU10	401 KAR 59:015, Section 4(2)(b) and (c)	Opacity	20%	NA	NA	Compliance is assumed while burning natural gas; Method 9 observation while burning liquid fuels based on site specific opacity monitoring plan
EU10	Boiler EU10	40 CFR 60.43c(c)	Opacity	20%, except one 6-min period per hour of not more than 27%	NA	NA	Method 9 observation
EU11	Emergency RICE	40 CFR 63, Subpart ZZZZ	NA	NA	NA	NA	Meet requirements of 40 CFR 60, Subpart JJJJ
EU12	Bakery Product Box Grinder	401 KAR 59:010, Section 3(1)	Opacity	20% based on 6-min avg	NA	NA	Method 9 observation
EU12	Bakery Product Box Grinder	401 KAR 59:010, Section 3(2)	PM	2.34 lb/hr when operating at 1,000 lbs/hr or less	NA	NA	Compliance assumed base don the emission factor determined from most recent stack test.
EU13	Boiler EU13	402 KAR 60:005, Section 2(2)(d) (Subpart Dc)	SO_2	NA	NA	NA	Monitoring/Recordkeeping/ Reporting Requirements in current Permit
EU13	Boiler EU13	402 KAR 52:020	SO_2	NA	Low Sulfur Diesel sulfur content $\leq$ 0.05 weight %	Low Sulfur Diesel sulfur content $\leq$ 0.05% weight	Fuel supplier certification

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU13	Boiler EU13	40 CFR 63, Subart JJJJ	NA	NA	Use of liquid fuels restricted to times of natural gas curtailment, gas supply interruption, startups, or periodic testing	Unit classified as natural gas-fired boiler & exempt from requirements	Maintain records of time periods when & reason why liquid fuel is fired
EU13	Boiler EU13	40 CFR 60.42c(d)	SO_2	0.50 lb/MMBtu when burning liquid fuels	NA	NA	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU13	Boiler EU13	401 KAR 59:015, Section 5(1)(c)(2)	SO_2	1.06 lb/MMBtu when burning natural gas	NA	NA	Compliance is assumed while burning natural gas
EU13	Boiler EU13	40 CFR 60.43c	PM	NA	NA	Low Sulfur Diesel sulfur content $\leq$ 0.5 weight %, or mixture of 0.5 weight % with other fuels	Sulfur concentration (ppm) and heat content testing, fuel supplier certification,
EU13	Boiler EU13	401 KAR 59:015, Section 4	PM	0.31 lb/MMBtu based on 3-hr avg	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel
EU13	Boiler EU13	401 KAR 59:015, Section 4(2)(b) and (c)	Opacity	20%	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel
EU13	Boiler EU13	40 CFR 60.43c(c)	Opacity	20%, except one 6-min period per hour of not more than 27%	NA	NA	Compliance is assumed while burning natural gas, low sulfur diesel, processed fats, or biodiesel

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
Facility wide	Facility wide	401 KAR 52:020	NOx	90 tpy	90 tpy	Monitor fuel usage	Calculate monthly and 12-month rolling emissions

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU02	Boiler EU02	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent) and heat content (MMBtu/hr)	Each shipment received of processed fats, low sulfur diesel, or biodiesel. May also use fuel supplier certification
EU02	Boiler EU02	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU04	Rendering Process and Finished Product Handling	Opacity	401 KAR 52:020, Section 10	Opacity	Weekly Method 22 observation. If VE observed, opacity should be determined by Method 9 observation.
EU04	Rendering Process and Finished Product Handling	VOC	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Weekly hours of operation and amount of materials processed
EU05	RTO	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly RTO fuel usage
EU06	Biomass Burner/Dryer	Opacity	401 KAR 52:020, Section 10	Opacity	Weekly Method 22 observation. If VE observed, opacity should be determined by Method 9 observation.
EU06	Biomass Burner/Dryer	VOC	401 KAR 52:020, Section 10	Fuel Usage	Weekly type and amount of fuel usage
EU06	Biomass Burner/Dryer	VOC	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Weekly hours of operation and amount of materials processed
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	Opacity	401 KAR 52:030, Section 10	Opacity	Weekly Method 22 observation. If VE observed, opacity should be determined by Method 9 observation.
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	NA	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Weekly hours of operation and amount of materials processed

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU09	Emergency RICE	NA	40 CFR 63.6625(f)	Non-resettable hour meter	Install a non-resettable hour meter by installation date.
EU09	Emergency RICE	NA	40 CFR 63.6625(i)	Oil Analysis Program	Change oil and filter every 500 hours of operation or annually, whichever comes first
EU09	Emergency RICE	NA	40 CFR 63.6603(a) and 40 CFR 63.6640(a)	Maintenance	Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first and replace as necessary
EU09	Emergency RICE	NA	40 CFR 63.6603(a) and 40 CFR 63.6640(a)	Maintenance	Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first and replace as necessary
EU09	Emergency RICE	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly fuel usage
EU09	Emergency RICE	NA	401 KAR 52:020, Section 10	Hours of operation	Monthly hours of operation
EU10	Boiler EU10	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent) and heat content (MMBtu/hr)	Each shipment received of low sulfur diesel. May also use fuel supplier certification
EU10	Boiler EU10	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent) and heat content (MMBtu/hr)	Each shipment received of biodiesel. May also use fuel supplier certification
EU10	Boiler EU10	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU10	Boiler EU10	Opacity	401 KAR 52:020, Section 10	Opacity	Weekly Method 22 observation when burning liquid fuels other than processed fats. If VE observed, opacity should be determined by Method 9 observation.
EU11	Emergency RICE	NA	401 KAR 52:020, Section 10	Engine Location	Monitor the engine's location, including initial date at each location, the date moved from each location, and the engine's function at each location.

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU11	Emergency RICE	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly fuel usage
EU12	Bakery Product Box Grinder	Opacity	401 KAR 52:020, Section 10	Opacity	Weekly Method 22 observation. If VE observed, opacity should be determined by Method 9 observation.
EU12	Bakery Product Box Grinder	NA	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Weekly hours of operation and amount of materials processed
EU13	Boiler EU13	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent) and heat content (MMBtu/hr)	Each shipment received of low sulfur diesel. May also use fuel supplier certification
EU13	Boiler EU13	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU02	Boiler EU02	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent)	Maintain records as required by Permit
EU02	Boiler EU02	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU02	Boiler EU02	NA	401 KAR 52:020, Section 10	NA	Maintain startup and shutdown procedure records as required by Permit
EU04	Rendering Process Line	VOC	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Monthly hours of operation and amount of materials processed
EU04	Rendering Process Line	NA	401 KAR 52:020, Section 10	Maintenance records	Maintain records of the maintenance conducted on the scrubbers.
EU04	Rendering Process Line	Opacity	401 KAR 52:020, Section 10	Opacity	Method 9 and Method 22 observations
EU05	RTO	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly RTO fuel usage
EU06	Biomass Burner/Dryer	VOC	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Monthly hours of operation and amount of materials processed
EU06	Biomass Burner/Dryer	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU06	Biomass Burner/Dryer	Opacity	401 KAR 52:020, Section 10	Opacity	Method 9 and Method 22 observations

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	NA	401 KAR 52:020, Section 10	Hours of operation and mixing and storage rate	Monthly hours of operation and mixing and storage rate
EU07	Product/Blending Stock mixing, Size Reduction, and Storage	Opacity	401 KAR 52:020, Section 10	Opacity	Method 9 and Method 22 observations
EU09	Emergency RICE	NA	40 CFR 63.6625(i)	Oil Analysis Program	Maintain records as required by Permit
EU09	Emergency RICE	NA	40 CFR 63.6655(a)(1)	Notifications	Maintain records of the notifications submitted to comply with the engine's requirements.
EU09	Emergency RICE	NA	40 CFR 63.6655(a)(2)	Malfunctions	Maintain records of the occurange and duration of each malfunction of operation or the air pollution control and monitoring equipment.
EU09	Emergency RICE	NA	40 CFR 63.6655(a)(3)	Engine Certification	Maintain records of the performance tests and performance evaluations as requried by 40 CFR 63.10(b)(2)(viii)
EU09	Emergency RICE	NA	40 CFR 63.6655(a)(4) and 40 CFR 63.6655(e)	Maintenance plan and records	Maintain records of the maintenance conducted on the engine.
EU09	Emergency RICE	NA	40 CFR 63.6655(a)(5))	Malfunctions	Maintain records of the actions taken during periods of malfuntion to minimize emissions in accordance with 40 CFR 63.6605(b).
EU09	Emergency RICE	NA	40 CFR 63.6655(f)(2) and 401 KAR 52:020, Section 10	Hours of operation	If not certified to the standards applicable to non-emergency engines, maintain records of the hours of operation spent in emergency and non-emergency situations.
EU09	Emergency RICE	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly fuel usage
EU10	Boiler EU10	SO_2	40 CFR 60.48c(e)(11), 40 CFR 60.48c(i), and 401 KAR 52:020, Section 10	Sulfur (weight percent)	Maintain records as required by Permit

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU10	Boiler EU10	PM, NOx, SO_2	40 CFR 60.48c(i)	NA	Maintain records as required by Permit
EU10	Boiler EU10	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU10	Boiler EU10	NA	401 KAR 52:020, Section 10	NA	Maintain startup and shutdown procedure records as required by Permit
EU11	Emergency RICE	NA	40 CFR 1068.201 and 401 KAR 52:020, Section 10	Engine Location	Maintain records of the engine's location, including initial date at each location, the date moved from each location, and the engine's function at each location.
EU11	Emergency RICE	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly fuel usage
EU12	Bakery Product Box Grinder	Opacity	401 KAR 52:020, Section 10	Opacity	Method 9 and Method 22 observations
EU12	Bakery Product Box Grinder	NA	401 KAR 52:020, Section 10	Hours of operation and amount of materials processed	Monthly hours of operation and amount of materials processed
EU13	Boiler EU13	SO_2	401 KAR 52:020, Section 10	Sulfur (weight percent)	Maintain records as required by Permit
EU13	Boiler EU13	VOC	401 KAR 52:020, Section 10	Fuel Usage	Monthly type and amount of fuel usage
EU13	Boiler EU13	NA	401 KAR 52:020, Section 10	NA	Maintain startup and shutdown procedure records as required by Permit
Facility Wide	Facility Wide	VOC	401 KAR 52:020, Section 10	VOC emissions	Calculate monthly facility wide VOC emissions

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EU10	Boiler EU10	SO_2	401 KAR 50:055, 40 CFR 60.44c(h) and 40 CFR 60.46c(d)(2	Sulfur (weight percent) and heat content (MMBtu/hr)	Each shipment received of low sulfur diesel and biodiesel. May also use fuel supplier certification
EU10	Boiler EU10	PM	401 KAR 50:045	Stack emissions	Conduct testing as requested by the Administrator
EU10	Boiler EU10	SO_2	401 KAR 50:055	Sulfur (weight percent) and heat content (MMBtu/hr)	Once every 12 months monitoring of processed fats, if burned.
EU10	Boiler EU10	Opacity	40 CFR 60.47c(a)	Opacity	Method 9 performance test in accordance with the Site Specific Opacity Plan when burning low sulfur diesel or biodiesel.
EU05					
EU05					
EU06					
EU06					
EU06					

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EU09	Emergency RICE	NA	40 CFR 60.6640(b)	Deviation of operational limitation	Each instance in which operating limiation have not been met.
EU09	Emergency RICE	NA	40 CFR 60.6640(e)	Deviation of applicability	Each instance in which requirements of Table 8 of 40 CFR 63, Subpart ZZZZ have not been met.
EU10	Boiler EU10	NA	40 CFR 48c(b)-(e) and 40 CFR 60.48c(j)	Opacity, SO_2,	Excess emissions
EU11	Emergency RICE	NA	401 KAR 52:020, Section 10	Engine location	Each instance in which the engine was relocated, including initial locations dates, move dates, and engine's function at each location.
Facility wide	Facility wide	NA	401 KAR 52:020, Section 26	NA	Semi-Annual Reports due by January 30th and July 30th for the previous 6-month monitoring period.
Facility wide	Facility wide	NA	401 KAR 52:020, Section 21	NA	Annual Compliance Certification due by January 30th for the previous 12-month monitoring period.
Facility wide	Facility wide	All	401KAR 52:020, Section 22	Total fuel usage and amount of materials processed	Information necessary to determine previous 12-month monitoring period facility wide emissions.

Section V.6: Notes, Comments, and Explanations
NA

Division for Air Quality
300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007DD

Insignificant Activities

___ Section DD.1: Table of Insignificant Activities
___ Section DD.2: Signature Block
___ Section DD.3: Notes, Comments, and Explanations

Source Name: **Darling Ingredients Inc.**

KY EIS (AFS) #: **21- 191-00007**

Permit #: **V-19-023**

Agency Interest (AI) ID: **3408**

Date: **5/6/2025**

Section DD.1: Table of Insignificant Activities

*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3… etc.

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
IS-01	Storage Vessels (associated with fuel		N/A	
	fuel oil storage and vehicle refueling operations)			
IS-02	Storage Vessels (containing inorganic		N/A	
	aqueous liquids, which do not include inorganic acids, with			
	boiling points below the maximum storage temperature at			
	atmospheric temperature)			

IS-03	Laboratory Fume Hoods and Vents (used exclusively for		N/A	
	for chemical or physical analysis)			
IS-04	No. 2 Oil-Fired Space Heaters (rated at less than 2.0 MMBtu/hr)		N/A	
IS-05	Degreasing Operations (parts washers used in routine maintenance)		N/A	
	≤ 145 gallons solvent per month			
IS-06	Wastewater Treatment Activities (streams contain < 1%		N/A	
	oil and grease content by volume)			
IS-07	Paved Haul Roads and Parking Lots		401 KAR 63:010	
IS-08	Boiler and Cooling Tower Blowdown Operations		401 KAR 63:010	
IS-09	Farming Operations (hay harvest from spray irrigation)		N/A	
IS-10	Routine Facility Maintenance		N/A	
IS-11	Cooling Tower		401 KAR 59:010	

IS-12	Unloading, Storage, & Transfer to Process Feed Hoppers		401 KAR 63:010	
IS-13	Product Loadout		401 KAR 63:010	

Section DD.2: Signature Block

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

By:	[signature] **Authorized Signature**	4/24/2025 **Date**
	BRANDON F LACHNER **Type/Print Name of Siguatory**	REGIONAL VICE PRESIDENT **Title of Siguatory**

Section DD.3: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007EE

Internal Combustion Engines

___ Section EE.1: General Information
___ Section EE.2: Operating Information
___ Section EE.3: Design Information
___ Section EE.4: Fuel Information
___ Section EE.5: Emission Factor Information
___ Section EE.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG

___ Attach EPA certification of the engine

Source Name: Darling Ingredients Inc.
KY EIS (AFS) #: 21- 191-00007
Permit #: V-19-023
Agency Interest (AI) ID: 3408
Date: 5/6/2025

Section EE.1: General Information

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed/ Modified	List Applicable Regulations
EU-09	Emergency RICE	NA	EP10	Cummins	6CTA8.3-G2	2002	2/8/2002	1/1/2010		40 CFR 63, Subpart ZZZZ; 401 KAR 63:002, Section 2(4),

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed/ Modified	List Applicable Regulations

Section EE.2: Operating Information

Emission Unit #	Engine Purpose (Identify if Non-Emergency, Emergency,Fire/Water Pump, Black-start engine for combustion turbine, Engine Testing)	Hours Operated	Is this engine a rental? *(Yes/No)*	Rental Time Period *(hrs)*	Alternate Operating Scenarios (Describe any operating scenarios in which the engine may be used in a different configuration)
EU09	Emergency	24	No	NA	

Section EE.3: Design Information

Emission Unit #	**Engine Type** (Identify all that apply: Commercial, Institutional, Stationary, Non-Road)	**Ignition Type** (Identify if either Compression or Spark Ignition)	**Engine Family** (Identify all that apply: 2-stroke, 4-stroke, Rich Burn, Lean Burn)	**Maximum Engine Power** *(bhp)*	**Maximum Engine Speed** *(rpm)*	**Total Displacement** *(L)*	**Number of Cylinders**
EU09	Industrial	Compression		277		8.3	6

Section EE.4: Fuel Information

Emission Unit #	Identify if Primary, Secondary, or Tertiary Fuel	Fuel Type (Identify if Diesel, Gasoline, Natural Gas, Liquefied Petroleum Gas (LPG), Landfill/Digester Gas, or Other)	Fuel Grade	Percent Time Used *(%)*	Maximum Fuel Consumption	Heat Content	Sulfur Content *(%)*	SCC Code	SCC Units
EU09	Primary	Distillate Oil (Diesel)		100			0.0015	20200107	1000 Gallons Distillate Oil (Diesel)

Section EE.5: Emission Factor Information

Emission factors expressed here are based on the potential to emit.

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
EU09	Distillate Oil (Diesel)	PM10	41.43	lb/1000 gallon Distillate Oil (Diesel)	AP-42
		SO2	38.76	lb/1000 gallon Distillate Oil (Diesel)	AP-42
		CO	126.97	lb/1000 gallon Distillate Oil (Diesel)	AP-42
		VOC	47.78	lb/1000 gallon Distillate Oil (Diesel)	AP-42
		NOx	589.4	lb/1000 gallon Distillate Oil (Diesel)	AP-42

Section EE.6: Notes, Comments, and Explanations
Remains unchanged

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007GG

Control Equipment

Additional Documentation

___ Complete Sections GG.1 through GG.12, as applicable

___ Attach manufacturer's specifications for each control device

___ Complete DEP7007AI

Source Name: Darling Ingredients Inc.

KY EIS (AFS) #: 21- 191-00007

Permit #: V-19-023

Agency Interest (AI) ID: 3408

Date: 5/6/2025

Section GG.1: General Information - Control Equipment

Control Device ID #	Control Device Name	Cost	Manufacturer	Model Name/ Serial #	Date Installed	Inlet Gas Stream Data For All Control Devices					Inlet Gas Stream Data For Condensers, Adsorbers, Afterburners, Incinerators, Oxidizers Only			Equipment Operational Data For All Control Devices		
						Temperature (°F)	Flowrate (scfm @ 68°F)	Average Particle Diameter (μm)	Particle Density (lb/ft³) or Specific Gravity	Gas Density (lb/ft³)	Gas Moisture Content (%)	Gas Composition	Fan Type	Pressure Drop Range (in. H_2O)	Pollutants Collected/ Controlled	Pollutant Removal (%)
NA	RTO	1,000,000	Combustion Controls Solutions	CCSWS-2014019	1/20/2008	135	15,000	<10	Unknown	Unknown	10	Unknown	Centrifugal	5	H2S / VOC / PM	100% / 95% / 85%
NA	Venturi	Unknown	AC Corporation	VS-12	1983	130	10,080	Unknown	Unknown	0.063	NA	NA	NA	6.0-9.0	PM / Odors	Unknown
NA	Packed Tower	Unknown	AC Corporation	MEF-PT-12	1983	130	10,080	Unknown	Unknown	0.063	NA	NA	NA	2.0-5.0	Odors	Unknown
NA	Room Air	Unknown	AC Corporation	RDS 100	1983	130	100,000	Unknown	Unknown	0.067	NA	NA	NA	2.0-3.0	Odors	Unknown

Section GG.2: Flare Source Information

Control Device ID #	**Identify all Emission Units and Control Devices that Feed to Flare**	**Type of Flare** (e.g. steam-assisted, air-assisted, nonassisted)	**Process Gas Flowrate** *(acfm)*	**Net Heating Value of Stream(s)** (Btu/scf)	**Removal Efficiency** *(%)*	**Flare Rated Capacity** *(MMBtu/hr)*
NA						

Section GG.3: Cyclone

Control Device ID #	**Identify all Emission Units and Control Devices that Feed to Cyclone**	**Identify Number of Cyclones:** Single <u>or</u> Multiple	**Identify Type:** High-Efficiency, Conventional, <u>or</u> High-Throughput	**Inlet Height** *(ft)*	**Inlet Width** *(ft)*	**Bottom Cone Height** *(ft)*	**Body Height** *(ft)*	**Body Diameter** *(ft)*	**Dust Outlet Tube Diameter** *(ft)*	**Gas Outlet Tube Diameter** *(ft)*	**Vortex Finder Height** *(ft)*
NA											

Section GG.4: Electrostatic Precipitator (ESP)

Control Device ID #	Identify all Emission Units and Control Devices that Feed to ESP	Identify Type: Dry negative corona, Wet negative corona or Wet positive corona	Number of Stages	Number of Plates per Stage	Plate Spacing *(in)*	ESP Total Width *(ft)*	ESP Total Height *(ft)*	Collection Plate Height *(ft)*	Length of Collection Plate *(ft)*	Particle Migration (Drift) Velocity *(specify units)*	Particle Resistivity *(specify units)*	Primary and Secondary Voltage Across Plates *(volts)*	Primary and Secondary Current *(amperes)*
NA													

Section GG.5: Scrubber

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Scrubber	Identify Type of Scrubber: Venturi, Packed Bed, Spray Tower, or Other (specify)	For Venturi Scrubbers:	For Packed Bed Scrubbers:		For Spray Towers:		Identify Type of Flow: Concurrent, Countercurrent, or Crossflow	Length in Direction of Gas Flow *(ft)*	Cross-Sectional Area *(ft^2)*	Venturi Throat Velocity *(ft/s)*	Mist Eliminator			Scrubbing Liquid			
			Identify Throat Type: Fixed or Adjustable	Identify Packing Type	Packing Height *(in)*	Number of Nozzles	Nozzle Pressure *(psig)*					Identify Type: Mesh or Vane	Cross-Sectional Area *(ft^2)*	Pressure Drop *(in. H_2O)*	Chemical Composition	Flowrate *(gal/min)*	Fresh Liquid Makeup Rate *(gal/min)*	Describe Disposal Method of Scrubber Effluent
NA	EU04	Venturi	Fixed	NA	NA	NA	NA	Concurrent	1.167	1.07	185	NA	NA	NA	Water	60	8-10	On-site Wastewater Lagoons
NA	EU04, Venturi Scrubber	Packed Bed	NA	PolyPro	120	1	3	Countercurrent	10	23.75	NA	PolyPro Chevron	23.75	0.5-1.5	Water with Sodium Hypochlorite or Caustic	120	8-15	On-site Wastewater Lagoons
NA	EU04, Venturi scrubber, and packed tower scrubber	Cross Flow	NA	NA	NA	720	14-16	Crossflow	33.33	49	NA	(2) Chevron Type	49	0.5-1.5	Water with Sodium Hypochlorite or Caustic	700	Unknown	On-site Wastewater Lagoons

Section GG.6: Filter

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Filter	Identify Type of Filter Unit: Baghouse, Cartridge Collector, or Other (specify)	Identify Type of Filtering Material: Fabric, Paper, Synthetic, or Other (specify)	Total Filter Area *(ft^2)*	Effective Air-to-Filter Ratio *($acfm/ft^2$)*	Continuous Monitoring Instrumentation (e.g. COMS, BLDS, none)	Additional Materials Introduced into the Control System (e.g. lime, carbon)		Identify Cleaning Method: Shaker, Pulse Air, Reverse Air, Pulse Jet, or Other (specify)	Identify Gas Cooling Method: Ductwork, Heat Exchanger, Bleed-in Air, Water Spray, or Other (specify)	For Ductwork:		For Bleed-in Air:	For Water Spray:
							Material	Injection Rate *(lb/hr)*			Length *(ft)*	Diameter *(ft)*	Flowrate *(scfm @ 68°F)*	Flowrate *(gal/min)*
Baghouse	EU04	Baghouse												

Section GG.7: Afterburner/Incinerator/Oxidizer

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Afterburner/Incinerator/ Oxidizer	Identify Type: Afterburner, Incinerator, Oxidizer, or Other (specify)	Number of Burners	Burner Rating *(BTU/hr)*	Dimensions of Combustion Chamber *(specify units)*	Residence Time *(sec)*	Combustion Chamber Temperature *(°F)*	Type of Catalyst (if applicable)	Type of Heat Exchanger (if applicable)	Auxiliary Fuel							Composition and Quantities of Combusted Waste
										Identify Fuel Type	Higher Heating Value *(MMBtu/scf)*	Hourly Fuel Usage *(scf/hr)*	% Sulfur (Maximum)	% Sulfur (Average)	% Ash (Maximum)	% Ash (Average)	
RTO	EU04, Venturi scrubber, and packed tower scrubber	Regenerative Thermal Oxidizer	1	3,000,000	26' x 5'	4	1,100	NA	NA	Natural gas	0.001	4,000	0	0	0	0	NA

Section GG.8: Adsorber

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Adsorber	Identify Adsorbate	Identify Adsorbent: Activated carbon, Activated alumina, Silica Gel, Synthetic Polymers, Zeolite, or Other (specify)	Dimensions of Each Bed				Type of Regeneration: Replacement, Steam, or Other (specify)	Regeneration Time *(minutes)*	Method of Regeneration: Alternate Use of Beds, Source Shutdown, or Other (specify)	Time On-line Before Regeneration *(minutes)*
				Thickness in Direction of Gas Flow *(in)*	Cross-Sectional Area *(in^2)*	Weight of Adsorbent per Bed *(lb)*	Number of Beds				
NA											

Section GG.10: Selective Catalytic Reduction (SCR) / Selective Non-catalytic Reduction (SNCR)

Control Device ID #	Identify all Emission Units and Control Devices that Feed to SCR/SNCR	Type (SCR/SNCR)	Gas Composition	Injection Grid Design (e.g. honeycomb)	Design Temperature Range		Reagent			Maximum Design Ammonia Slip *(ppm)*	SCR **Only**			
								Injection Rate			Catalyst			
					Min *(°F)*	Max *(°F)*	Type	Min *(lb/hr)*	Max *(lb/hr)*		Composition	Volume *(ft^3)*	Weight *(lb)*	Replacement Schedule
NA														

Section GG.9: Condenser

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Condenser	Identify Type of Condenser: Spray Tower, Jet Ejector, Barometric, Single-Pass Shell-and-Tube, or Multi-Pass Shell-and-Tube (if multi-pass, indicate number of passes)	Identify Type of Coolant: Water, Brine, Liquid Nitrogen, CFC/HFC, or Other (specify)	Coolant Temperature		Coolant Liquid Flowrate *(gpm)*	Coolant Gas Flowrate *(scfm @ 68 °F)*	Condensing Surface Area *(specify units)*	Outlet Gas Temperature *(°F)*	Outlet Gas Composition
				Inlet *(°F)*	Outlet *(°F)*					
NA										

Section GG.11: Other Control Equipment

Control Device ID #	**Identify all Emission Units and Control Devices that Feed to Control Equipment**	**Type of Control Equipment** (provide description and a diagram with dimensions)
NA		

Section GG.12: Notes, Comments, and Explanations
No changes

DARLING INGREDIENTS INC.

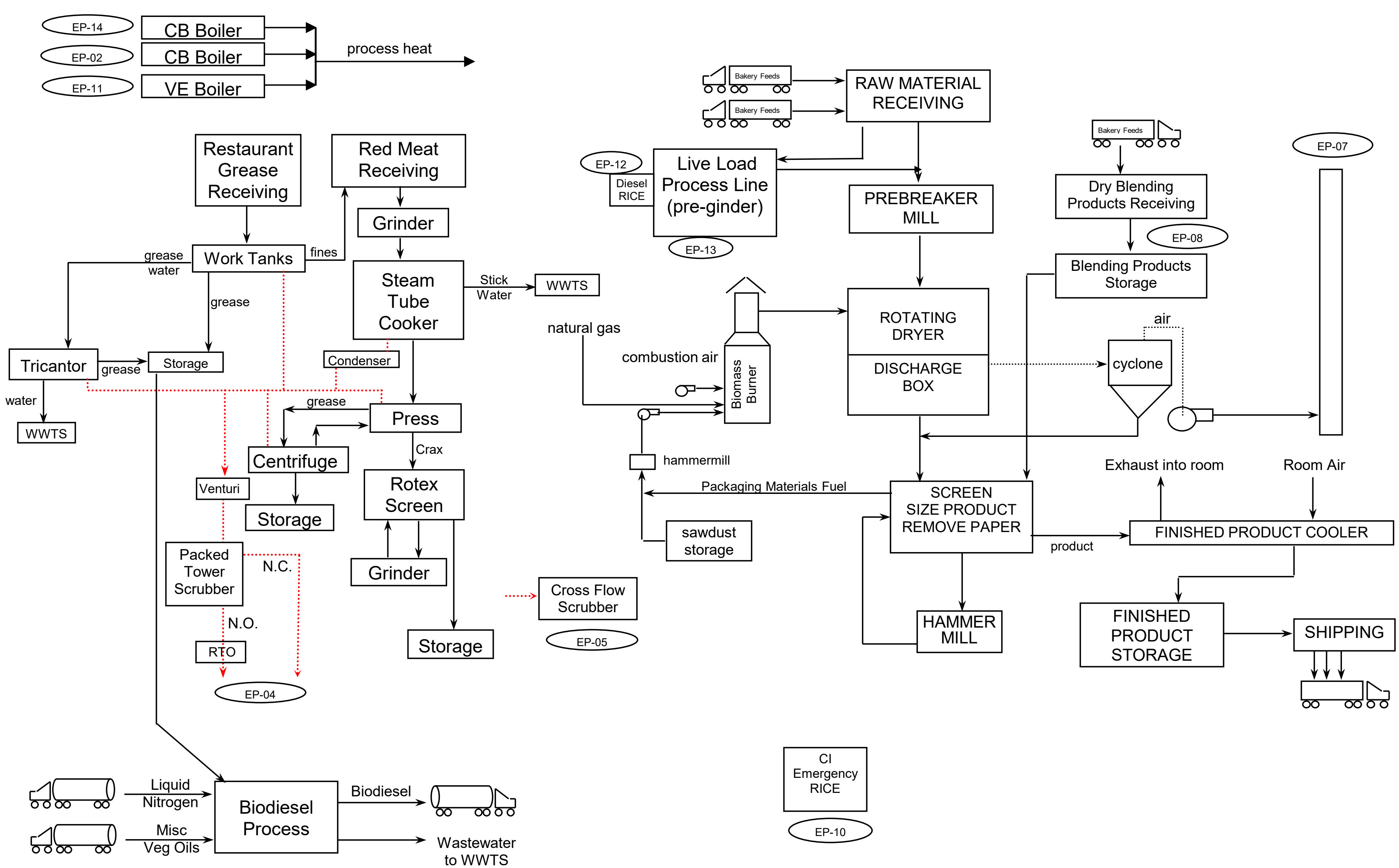
APPLICATION FOR TITLE V RENEWAL & MODIFICATIONS

BUTLER, KENTUCKY

APPENDIX A

PROCESS FLOW DIAGRAM

Process Flow Diagram
Butler, Kentucky



DARLING INGREDIENTS INC.

APPLICATION FOR TITLE V RENEWAL & MODIFICATIONS

BUTLER, KENTUCKY

APPENDIX B

AIR TOXIC EMISSIONS CALCULATION SPREADSHEET

Butler, Kentucky
Air Toxics Calculations

125,791,000 = rated boiler heat input in Btu/hr (combined Boilers)
1,000 = heat content of Natural Gas (Btu/scf)
133,650 = heat content of LSD fuel oil (Btu/gal)
3,000,000 = rated RTO burner input in Btu/hr
22,500,000 = rated biomass burner burner input in Btu/hr
1,939,000 = rated RICE EU09 input in Btu/hr
3,260,000 = rated RICE EU11 input in Btu/hr

Pollutant	Natural Gas: Emission Factor* (lbs/10^6 scf)	Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (tpy)
2-Methylnapthalene	2.40E-05	2.40E-08	3.63E-06	1.59E-05
3-Methylchloranthrene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
7,12- Dimethylbenz(a)anthracene	1.60E-05	1.60E-08	2.42E-06	1.06E-05
Acenaphthene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Acenaphthylene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Anthracene	2.40E-06	2.40E-09	3.63E-07	1.59E-06
Arsenic	2.00E-04	2.00E-07	3.03E-05	1.33E-04
Barium	4.40E-03	4.40E-06	6.66E-04	2.92E-03
Benz(a)anthracene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Benzene	2.10E-03	2.10E-06	3.18E-04	1.39E-03
Benzo(a)pyrene	1.20E-06	1.20E-09	1.82E-07	7.95E-07
Benzo(b)fluoranthene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Benzo(g,h,i)perylene	1.20E-06	1.20E-09	1.82E-07	7.95E-07
Benzo(k)fluoranthene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Beryllium	1.20E-05	1.20E-08	1.82E-06	7.95E-06
Butane	2.10E+00	2.10E-03	3.18E-01	1.39E+00
Cadmium	1.10E-03	1.10E-06	1.66E-04	7.29E-04
Chromium	1.40E-03	1.40E-06	2.12E-04	9.28E-04
Chrysene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Cobalt	8.40E-05	8.40E-08	1.27E-05	5.57E-05
Copper	8.50E-04	8.50E-07	1.29E-04	5.63E-04
Dibenzo(a,h)anthracene	1.20E-05	1.20E-08	1.82E-06	7.95E-06
Dichlorobenzene	1.20E-03	1.20E-06	1.82E-04	7.95E-04
Ethane	3.10E+00	3.10E-03	4.69E-01	2.05E+00
Fluoranthene	3.00E-06	3.00E-09	4.54E-07	1.99E-06
Fluorene	2.80E-06	2.80E-09	4.24E-07	1.86E-06
Formaldehyde	7.50E-02	7.50E-05	1.13E-02	4.97E-02
Hexane	1.80E+00	1.80E-03	2.72E-01	1.19E+00
Indeno(1,2,3-cd)pyrene	1.80E-06	1.80E-09	2.72E-07	1.19E-06
Lead	5.00E-04	5.00E-07	7.56E-05	3.31E-04
Manganese	3.80E-04	3.80E-07	5.75E-05	2.52E-04
Mercury	2.60E-04	2.60E-07	3.93E-05	1.72E-04
Molybdenum	1.10E-03	1.10E-06	1.66E-04	7.29E-04
Napthalene	6.10E-04	6.10E-07	9.23E-05	4.04E-04
Nickel	2.10E-03	2.10E-06	3.18E-04	1.39E-03
Pentane	2.60E+00	2.60E-03	3.93E-01	1.72E+00
Phenanathrene	1.70E-05	1.70E-08	2.57E-06	1.13E-05
Propane	1.60E+00	1.60E-03	2.42E-01	1.06E+00
Pyrene	5.00E-06	5.00E-09	7.56E-07	3.31E-06
Selenium	2.40E-05	2.40E-08	3.63E-06	1.59E-05
Toluene	3.40E-03	3.40E-06	5.14E-04	2.25E-03
Vanadium	2.30E-03	2.30E-06	3.48E-04	1.52E-03
Zinc	2.90E-02	2.90E-05	4.39E-03	1.92E-02
			Sum of KDEP HAPs	1.25E+00

* All emission factors from AP-42 Natural Gas Combustion

Pollutant	Diesel for RICE EU09 (500 hours): Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (tpy)	
Benzene	0.000933	1.81E-03	4.52E-04	
Toluene	0.000409	7.93E-04	1.98E-04	
Xylene	0.000285	5.53E-04	1.38E-04	
Formaldehyde	0.00118	2.29E-03	5.72E-04	
1,3-Butadiene	0.0000391	7.58E-05	1.90E-05	
Acetaldehyde	0.000767	1.49E-03	3.72E-04	
Acrolein	0.0000925	1.79E-04	4.48E-05	
Naphthalene	0.0000848	1.64E-04	4.11E-05	
		Sum of KDEP HAPs	1.84E-03	tpy PTE

* All emission factors from AP-42 Gasoline and Diesel Industrial Engines

Pollutant	Diesel for RICE EU11: Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (tpy)	
Benzene	0.000933	3.04E-03	1.33E-02	
Toluene	0.000409	1.33E-03	5.84E-03	
Xylene	0.000285	9.29E-04	4.07E-03	
Formaldehyde	0.00118	3.85E-03	1.68E-02	
1,3-Butadiene	0.0000391	1.27E-04	5.58E-04	
Acetaldehyde	0.000767	2.50E-03	1.10E-02	
Acrolein	0.0000925	3.02E-04	1.32E-03	
Naphthalene	0.0000848	2.76E-04	1.21E-03	
		Sum of KDEP HAPs	5.41E-02	tpy PTE

* All emission factors from AP-42 Gasoline and Diesel Industrial Engines

Pollutant	Sawdust, Packaging Materials Fuel, Peanut Shells/Hulls: Emission Factor (lb/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (tpy)
Acetaldehyde	0.00083	1.87E-02	4.67E-03
Acetophenone	3.2E-09	7.20E-08	1.80E-08
Acrolein	0.004	9.00E-02	2.25E-02
Antimony	0.0000079	1.78E-04	4.44E-05
Arsenic	0.000022	4.95E-04	1.24E-04
Barium	0.00017	3.83E-03	9.56E-04
Benzene	0.0042	9.45E-02	2.36E-02
Benzo(a)pyrene (T)	0.0000026	5.85E-05	1.46E-05
Beryllium	0.0000011	0.00002475	6.1875E-06
Cadmium	0.0000041	9.23E-05	2.31E-05
Carbon tetrachloride (TH)	0.000045	1.01E-03	2.53E-04
Chlorine (TH)	0.00079	1.78E-02	4.44E-03
Chlorobenzene	0.000033	7.43E-04	1.86E-04
Chloroform	0.000028	6.30E-04	1.58E-04
Chromium	0.000021	4.73E-04	1.18E-04
Chromic acid (VI) (Add as comp. of solCR6 and CRC)(T/H)	0.0000035	7.88E-05	1.97E-05
Cobalt	0.0000065	1.46E-04	3.66E-05
Coppper	0.000049	0.0011025	0.00027563
Dinitrophenol, 2,4- (H)	0.00000018	4.05E-06	1.01E-06

Butler, Kentucky
Air Toxics Calculations

	ULSD		
	Emission Factor (lbs/10^{12} Btu)	Emission Rate (lbs/hr)	Emission Rate (tpy)
Arsenic	4	5.03E-04	2.20E-03
Berrylium	3	3.77E-04	1.65E-03
Cadmium	3	3.77E-04	1.65E-03
Chromium	3	3.77E-04	1.65E-03
Copper	6	7.55E-04	3.31E-03
Lead	9	1.13E-03	4.96E-03
Mercury	3	3.77E-04	1.65E-03
Manganese	6	7.55E-04	3.31E-03
Nickel	3	3.77E-04	1.65E-03
Selenium	15	1.89E-03	8.26E-03
Zinc	4	5.03E-04	2.20E-03
		Sum of KDEP HAPs	2.70E-02 tpy PTE

* All emission factors from AP-42 Fuel Oil Combustion

	Processed Fats and Biodiesel			
	Emission Factor (lbs/1000 gal)	Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (tpy)
NA	NA	NA	NA	NA

= Indicates HAP according to KDEP (KDEP uses EPA list)

Di(2-ethylhexyl)phthalate (DEHP) (TH)	4.7E-08	1.06E-06	2.64E-07
Ethyl benzene	0.000031	6.98E-04	1.74E-04
Ethylene dichloride	0.000029	6.53E-04	1.63E-04
Formaldehyde	0.0044	9.90E-02	2.48E-02
Hydrogen Chloride	0.019	4.28E-01	1.07E-01
Lead	0.000048	1.08E-03	2.70E-04
Manganese	0.0016	3.60E-02	9.00E-03
Mercury	0.0000035	0.00007875	1.9688E-05
Methyl bromide	0.000015	3.38E-04	8.44E-05
Methyl chloride	0.000023	5.18E-04	1.29E-04
Methyl chloroform (1,1,1-Trichloroethane)	0.000031	6.98E-04	1.74E-04
Methyl ethyl ketone	0.0000054	1.22E-04	3.04E-05
Methylene chloride	0.00029	6.53E-03	1.63E-03
Napthalene	0.000097	2.18E-03	5.46E-04
Nickel	0.000033	7.43E-04	1.86E-04
Nitrophenol, 4- (H)	0.00000011	2.48E-06	6.19E-07
Pentachlorophenol (TH)	5.1E-08	1.1475E-06	2.8688E-07
Perchloroethylene (tetrachloroethylene) (TH)	0.000038	8.55E-04	2.14E-04
Phenol	0.000051	1.15E-03	2.87E-04
Phosphorous	0.000027	6.08E-04	1.52E-04
Polychlorinated biphenyls (TH)			
Propionaldehyde	0.000061	1.37E-03	3.43E-04
Propylene dichloride (H) (1,2 dichloropropane)	0.000033	7.43E-04	1.86E-04
Selenium	0.0000028	6.30E-05	1.58E-05
Styrene	0.0019	4.28E-02	1.07E-02
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	8.6E-12	1.935E-10	4.8375E-11
Toluene	0.00092	2.07E-02	5.18E-03
Trichloroethylene (TH)	0.00003	6.75E-04	1.69E-04
Trichlorofluoromethane (CFC 111) (T)	0.000041	9.23E-04	2.31E-04
Trichlorophenol, 2,4,6- (H)	2.2E-08	4.95E-07	1.24E-07
Vinyl chloride (TH)	0.000018	4.05E-04	1.01E-04
Xylenes	0.000025	5.63E-04	1.41E-04
Zinc	0.00042	9.45E-03	2.36E-03
		Sum of KDEP HAPs	2.18E-01 tpy PTE

* All emission factors from AP-42 Wood Residue Combustion

Darling Ingredients
4221 Alexandria Pike
Cold Spring, KY 41076
T 859 781 2010
darlingii.com

Via EEC eForm Portal

December 29, 2022

Kentucky Energy and Environment Cabinet
Division for Air Quality
Permit Support Section
300 Sower Boulevard
Frankfort, Kentucky 40601

Subject: Notification of Cooker "In-Kind" Replacement
Darling Ingredients Inc. – Butler, Kentucky Facility
Title V Permit No.: V-19-023

To Whom It May Concern,

Darling Ingredients Inc. (Darling) herein provides the Kentucky Energy and Environment Cabinet (EEC), Division for Air Quality (DAQ), with mailed copy to the United States Environmental Protection Agency (USEPA) Region IV, this notification of the upcoming "in-kind" replacement of the Dupps 4300 Discor Cooker associated with Emission Unit (EU) 04 at the subject Darling facility. Darling is providing the necessary details to the DAQ as prescribed in 401 KAR 52:020, Section 18 Section 502(b)(10) Changes, including the *"brief description of each change, the date on which the change will occur, any change in emissions that will result, and any permit term or condition that will no longer be applicable after the change."*

Thus, Darling is submitting the below information to satisfy the notification requirements and understands that the facility may conduct the change within seven (7) days of this notification.

1. **Brief description of the change:**

   The Dupps 4300 Discor Cooker is currently permitted within the Rendering Process (EU 04) and has reached maturity and equipment life cycle. The current cooker will be replaced with another identical Dupps 4300 Discor Cooker, which contains identical performance parameters.

   This notification of "in-kind" replacement meets all applicable requirements, does not violate any existing permit term or condition, and does not constitute a Title I modification. Based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

2. **Date on which the change will occur:**

   Darling anticipates conducting the above listed change as early as February 2023.

3. **Pollutants emitted:**

   There will be no change in the criteria pollutant inventory provided to and approved by the DAQ in the most recent Title V renewal, including particulate matter (PM), PM less than 10 microns, PM less than 2.5 microns, sulfur dioxide, and volatile organic compounds.

4. **Resulting change in emissions:**

There will be no change in the criteria pollutant inventory as a result of the change.

5. **Any permit term or condition that is no longer applicable after the change:**

   There will be no change in applicable requirements, permit terms or conditions as a result of the change.

Darling appreciates the Kentucky EEC DAQ's assistance in this matter. If there should be any questions concerning this information, please contact me at your convenience at the address or telephone number listed at the top of the cover page, or you may contact by email at Eric.King@darlingii.com.

Sincerely,
DARLING INGREDIENTS INC.

Eric King
Manager of Environmental Affairs

cc: Brandon Lairmore, Senior Vice President of Northeast Region (email only)
Doug Spritzky, Regional Vice President Great Lakes 1 (email only)
Brad Eden, General Manager (email only)
Jon Elrod, Director of Environmental Affairs (email only)
USEPA Region IV

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

___ Additional Documentation attached

Source Name:	**Darling Ingredients Inc.**
KY EIS (AFS) #:	**21- 191-00007**
Permit #:	**V-19-023**
Agency Interest (AI) ID:	**3408**
Date:	**12/29/2022**

Section AI.1: Source Information

Physical Location Address:	**Street:**	1176 Bryan Griffin Road				
	City:	Butler	**County:**	Pendleton	**Zip Code:**	41006
Mailing Address:	**Street or P.O. Box:**	4221 Alexandria Pike				
	City:	Cold Spring	**State:**	KY	**Zip Code:**	41076

Standard Coordinates for Source Physical Location

Longitude: -84.404064 (decimal degrees) **Latitude:** 38.730853 (decimal degrees)

Primary (NAICS) Category: Rendering and Meat Byproduct Processing **Primary NAICS #:** 311613

Classification (SIC) Category: Animal and Marine Fats and Oils **Primary SIC #:** 2077

Briefly discuss the type of business conducted at this site: The facility recycles inedible animal byproducts and bakery materials into ingredients used in the manufacturing of animal feed.

Description of Area Surrounding Source:
☑ Rural Area ☐ Industrial Park ☐ Residential Area
☐ Urban Area ☑ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 86

Approximate distance to nearest residence or commercial property: *0.5 miles*

Property Area: **Approx. 518 acres**

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:
☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: ______________
☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Darling Ingredients Inc.

Title: (if individual)

Mailing Address:
Street or P.O. Box: 4221 Alexandria Pike
City: Cold Spring **State:** KY **Zip Code:** 41076

Email: (if individual)

Phone: (859) 781-2010

Technical Contact

Name: Eric King

Title: Manager of Environmental Affairs

Mailing Address:
Street or P.O. Box: 4221 Alexandria Pike
City: Cold Spring **State:** KY **Zip Code:** 41076

Email: cteastenv@darlingii.com

Phone: (859) 572-2571

Air Permit Contact for Source

Name: Brad Eden

Title: General Manager

Mailing Address:
Street or P.O. Box: 1176 Bryan Griffin Road
City: Butler **State:** KY **Zip Code:** 41006

Email: Brad.Eden@darlingii.com

Phone: (859) 472-7361

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: ______________________

Title: ______________________

Mailing Address:
Street or P.O. Box: ______________________
City: ________ **State:** ________ **Zip Code:** ________

Email: ______________________

Phone: ______________________

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☑ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: ____________

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* NA

Proposed Operation Start-Up Date: *(MM/YYYY)* NA

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* 02/2023

Proposed Operation Start-Up Date: *(MM/YYYY)* 02/2023

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☑ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☐ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☐ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☐ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☐ DEP7007DD Insignificant Activities
- ☐ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☐ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buldings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☐ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☐ Other: ____________________

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Douglas J Spritzky (signature)	12/29/2022
Authorized Signature	**Date**
Doug Spritzky	Vice President Great Lakes Region 1
Type or Printed Name of Signatory	**Title of Signatory**

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	**DEP7007B** Manufacturing or Processing Operations ___ Section B.1: Process Information ___ Section B.2: Materials and Fuel Information ___ Section B.3: Notes, Comments, and Explanations	**Additional Documentation** ___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG. ___ Attach a flow diagram ___ Attach SDS

Source Name: **Darling Ingredients Inc.**

KY EIS (AFS) #: **21- 191-00007**

Permit #: **V-19-023**

Agency Interest (AI) ID: **3408**

Date: **12/29/2022**

Section B.1: Process Information

Emission Unit #	Emission Unit Name	Describe Emission Unit	Process ID	Process Name	Manufacturer	Model No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Is the Process Continuous or Batch?	Number of Batches per 24 Hours *(if applicable)*	Hours per Batch *(if applicable)*
EU04	Rendering Process	Rendering process line	EU04	Rendering Process	Dupps	Discor 4300	02/2023	Continuous	NA	NA

Section B.2: Materials and Fuel Information

**Maximum yearly fuel usage rate only applies if applicant request operating restrictions through federally enforceable limitations.*

Emission Unit #	Emission Unit Name	Name of Raw Materials Input	Maximum Quantity of Each Raw Material Input		Total Process Weight Rate for Emission Unit *(tons/hr)*	Name of Finished Materials	Maximum Quantity of Each Finished Material Output		Fuel Type	Maximum Hourly Fuel Usage Rate		Maximum Yearly Fuel Usage Rate		Sulfur Content *(%)*	Ash Content *(%)*
				(Specify Units/hr)				*(Specify Units/hr)*			*(Specify Units)*		*(Specify Units)*		
EU04	Rendering Process	Animal By-Products	NA	NA	NA	Meat Meal, Processed Fats	5.7	Tons of meal per hour	NA	NA	NA	NA	NA	NA	NA

Section B.3: Notes, Comments, and Explanations
Maximum Quantity of Each Raw Material Input for EU04 has been answered "NA." As stated during previous permitting iterations, production of finished products is accomplished by removing moisture from raw materials. Accordingly, raw material moisture content is the "limiting factor" for production. Since moisture content varies greatly depending on the raw material being utilized, it is not feasible to set a specific maximum quantity input potential for these raw materials.
Darling has stated a maximum quantity of finished product of 5.7 tons meal per hour; however, this should not be used as a production limit but only a theoretical yield using an assumed moisture content of the raw material and evaporative rate of the rendering cooker.

Outlook

RE: AI 3408 ; DARLING INGREDIENTS INC. 1176 Bryan Griffin Road

From Cummins-Thomas, Kelly <KThomas@darlingii.com>
Date Wed 12/17/2025 10:30 AM
To Ateyeh, Ossama (EEC) <ossama.ateyeh@ky.gov>; Eden, Brad <beden@darlingii.com>
Cc Bittner, Zachary P (EEC) <Zachary.Bittner@ky.gov>; Daniels, Stacie (EEC) <stacie.daniels@ky.gov>; Tempus-Doom, Amy K (EEC) <Amy.Tempus-Doom@ky.gov>; Smith, Matthew <MSmith@darlingii.com>; Weiss, Emma <Emma.Weiss@darlingii.com>

1 attachment (2 MB)
Boiler No 2 Firing Processed Grease 022001.pdf;

Good morning Ossama,

As stated in the application to renew the Title V Operating Permit narrative, the emission factors developed for the combustion of processed fats were based on the source test conducted at the Darling Ingredients Inc. Union City, Tennessee facility. The test was completed by Secor International Incorporated on February 20, 2001 on a 1,200 HP 50.219 mmBtu/hr boiler. VOC, SO2, NOx, CO, and PM emission factors were developed based on the processed fat's higher heat value of 125,900 Btu/gal. This engineering testing did not include delineation of PM2.5/PM10 emissions; however, Darling believes that all PM emissions from the combustion of processed fats fuel are PM10, and that PM2.5 emissions are negligible as the processed fats and biodiesel fuels do not contain any metals, or toxic/hazardous constituents, and contain only negligible VOC and sulfur content.

If you should have any additional questions, please let me know.

Thank you,

Kelly C. Thomas
Director of Environmental Affairs
O: 859.572.2591 M: 859.684.5927

DARLING INGREDIENTS

darlingii.com

From: Ateyeh, Ossama (EEC) <ossama.ateyeh@ky.gov>
Sent: Wednesday, December 17, 2025 9:50 AM

To: Cummins-Thomas, Kelly <KThomas@darlingii.com>; eastenv, ct <cteastenv@darlingii.com>; Eden, Brad <beden@darlingii.com>
Cc: Bittner, Zachary P (EEC) <Zachary.Bittner@ky.gov>; Daniels, Stacie (EEC) <stacie.daniels@ky.gov>; Tempus-Doom, Amy K (EEC) <Amy.Tempus-Doom@ky.gov>
Subject: AI 3408 ; DARLING INGREDIENTS INC. 1176 Bryan Griffin Road

---

Greeting to all;
I hope my E-Mail find you well and ready for the holidays;
I have a concern with respect to the Emission Factor used for Processed Fats, and Biodiesel Fuels. For VOC Emissions.
My supervisor brought that to my attention.
The applicant claiming Zero (0) Emission Factor for these Fuels.
Have the applicant tested these fuels and this is the results. If not what was the source for Zero Emission factor for the fuels?
Please provide any information or documents proves the finding. If this was based on an assumption , then the permittee shall conduct performance test of VOC to confirm the emission factors used or assumed for the two fuels.
This will be included in the permit and will not delay the processing and Issuing of the permit!
Thank you and have a nice holiday's

GRIFFIN INDUSTRIES, INC.

EMISSIONS MEASUREMENTS RESULTS FOR BOILER NUMBER 1 WHILE FIRING PROCESSED GREASE

Prepared for:

GRIFFIN INDUSTRIES, INC.
4221 Alexandria Park
Cold Spring, Kentucky 41076

Prepared by:

SECOR INTERNATIONAL INCORPORATED
318 Seaboard Lane, Suite 101
Franklin, Tennessee 37067

Testing Performed February 20, 2001
Report Submitted March 2001

SECOR
International Incorporated

March 30, 2001

Mr. Mike Schmidt
Griffin Industries
4221 Alexandria Pike
Cold Spring, Kentucky 41076

RE: Emissions Measurements Results for Boiler Number 2 While Firing Processed Grease

Dear Mr. Schmidt:

This report with supporting documentation presents the results of the informational emissions measurements program conducted at the Griffin Industries (Griffin) facility located in Union City, Tennessee. The emissions measurements were conducted at the Boiler Number 2 exhaust while firing processed grease (waste cooking oil). Boiler Number 2 is a 1,200 HP Packaged Firetube boiler manufactured in 1998 by the Johnston Boiler Company with 6,000 square feet of heating surface. This informational testing program was conducted to determine the emissions of particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC) exhausted by Boiler Number 2. The PM sampling associated with this testing program was performed for the demonstration of compliance with the limits specified in the operating permit for this facility. The PM results submitted March 23, 2001 under separate cover to Griffin are intended for the regulatory agency. A summary of the PM sampling results is included in this report.

Griffin retained SECOR International Incorporated (SECOR) to perform the emissions measurement program. SECOR staff members Mr. David West, Mr. John Mullins and Mr. Adam Crews performed the emissions measurement program on February 20, 2001. Mr. Michael Schmidt, Environmental Manager for Griffin, was responsible for the coordination of the test program.

The PM sampling was performed in accordance with the *Code of Federal Regulations, Title 40, Part 60 (40 CFR 60), Appendix A, Reference Method (RM) 5, "Determination of Particulate Emissions from Stationary Sources."* RM 5 provides for the isokinetic extraction of particulate matter from an emission source and allows for the quantification of particulate emission rates. In conjunction with the RM 5 sampling system, RM's 1, 2 and 4 data were collected for the determination of stack gas volumetric flow rate and moisture content. The oxygen (O_2), carbon dioxide (CO_2), SO_2 and NO_x sampling was performed following 40 CFR 60, Appendix A, RM 3A, *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure),"* RM 6C, *"Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)"* and RM 7E, *"Determination of Nitrogen Oxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)."* The above methods provide for the

318 Seaboard Lane, Suite 101, Franklin, TN 37067 615.794.1524 615.794.3076 Fax www.secor.com

continuous extraction of a gas sample from an effluent stream and analyzing using the appropriate analyzer. The O_2 concentration was determined using a paramagnetic analyzer and the CO_2 concentration was determined using an infrared analyzer (IR). An ultraviolet (UV) analyzer was used for the determination of the SO_2 concentration of the effluent sample. The NO_x concentration was determined using a chemiluminescent analyzer. For the determination of the CO concentration, RM 10, *"Determination of Carbon Monoxide Emissions From Stationary Sources"*, was followed. Following this method, the CO concentration of the effluent stream was determined using a Luft-type non-dispersive infrared analyzer (NDIR). The continuous sampling procedures of RM 10 were followed with the quality assurance procedures of RM 6C incorporated into the sampling system calibration and bias determination procedures. The VOC sampling was accomplished following RM 25A, *"Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer."* As prescribed by this method, the gas sample was continuously withdrawn from the effluent stream and directed to an instrument equipped with a flame ionization detector (FID), for the determination of the VOC concentration. The sampling system bias determination procedures of RM 6C were incorporated into this sampling method. The results of the RM 5 sampling as well as the data from the instrumental analyzers were combined with the RM 1, 2 and 4 data collected in order to determine the pollutant mass emission rate for each parameter.

PROCESS INFORMATION

The emissions measurements were conducted during normal process operations. The test program was conducted with the boiler firing processed grease. SECOR and Griffin staff maintained close communication to ensure that the collected samples were representative and typical of the emissions exhausted from the emission point at the time of testing.

During the test, this boiler was operated as the lead boiler and was continuously fired at the maximum rate that could be achieved on this fuel. Due to the differences in viscosities between the processed grease and number 2 diesel fuel, the fuel supply pump was not able to move as much grease as number 2 diesel fuel. Therefore, the maximum heat input value was slightly lower than when burning number 2 diesel fuel. The processed grease was heated to 190°F before being fired.

SUMMARY OF RESULTS

The emissions measurements conducted at Boiler Number 2 were collected with the boiler firing processed grease at an average heat input of 40.09 lb/mmBTU. A total of three sample runs were performed for the determination of the PM, SO_2, NO_x, CO and VOC emissions associated with this source. For the PM sampling train, the positive pitot tube leak check conducted at the end of Run 1 did not pass. This was discussed with Mr. Mike Schmidt of Griffin and with APCD staff observing the test program. APCD staff agreed to accept the results of the sample run provided that Griffin understood that the results could be biased against them. The results of the sample run met the RM 5 criteria for isokinetic sampling. However, the measured volumetric flow rate for Run 1 was 6,283 dscfm, which is lower than the measured volumetric flow rates for Runs 2 and 3, 6,819 and 7,083 dscfm, respectively. The sample collected at the lower measured volumetric flow could potentially bias the sample results low. Upon completion of the sample analysis, the Run 1 sample had the highest particulate concentration, and the highest corresponding mass emission rates. The results of Run 1 present a worst-case scenario for the PM emissions therefore the results of Run 1 have been included in the presentation of the results for the sampling program. A summary of the results of the sampling program is provided in the following table with supporting data included in the appendices.

METHODOLOGY

The emission measurement program was completed following accepted and approved EPA Reference Methods as contained in EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods*, and the *40 CFR 60, Appendix A*. The general procedures that were used in this measurement program include the following:

Support Measurements for Stack Parameters

EPA RMs 1 through 4 were performed to provide support data for emission rate calculations. Ideally, measurements should be performed at least eight stack diameters downstream and two diameters upstream from any flow disturbance. RM 1, selection of sample points for velocity traverses, was determined using existing test port locations prior to the initiation of the measurements.

Selection of Traverse Points

EPA RM 1, *"Sample and Velocity Traverses for Stationary Sources"* was used for the selection of velocity traverse points at the test location. The calculated measurement points were used for the flow rate determination. This was performed by taking the cross-sectional area of the effluent stack, at the measurement location, and dividing it into equal areas. The measurement traverse points were located in the center of each of the equal areas.

Summary of Results
Boiler Number 2 While Firing Processed Grease
Griffin Industries, Incorporated
Union City, Tennessee
February 20, 2001

	Run 1	Run 2	Run 3	Average	
Time (CST)	14:30 – 15:39	17:03 – 18:08	18:45 – 19:52	---	
Boiler Heat Input, (mmBTU/hr)	37.66	40.33	42.29	40.1	
STACK GAS CONDITIONS					
Temperature (^oF)	337.1	352.3	350.1	347	
Oxygen (%)	5.1	4.6	4.8	4.8	
Carbon Dioxide (%)	12.0	12.4	12.2	12.2	
Moisture (%)	11.14	10.84	11.06	11.0	
Velocity (ft/sec.)	42.5	46.9	48.7	46.0	
Volumetric Flow Rate					
(acfm)	10,715	11,811	12,261	11,595	
(wscfm)	7,071	7,648	7,963	7,561	
(dscfm)	6,283	6,819	7,083	6,728	
Isokinetic Sample Rate (%)	104	104	103	103	
PARTICULATE SAMPLE RESULTS					
Concentration, (gr/dscf)	0.008089	0.006111	0.005702	0.00663	AF 125,900 BTU/GAL
Mass Emission Rate					
(Lb/hr)	0.4356	0.3572	0.3462	0.380	
(Lb/mmBTU)	0.0116	0.0089	0.0082	0.010	1.259 LBS/1000 GALS
SO_2 SAMPLE RESULTS					
Concentration, (ppm_{vd} – bias corrected)	0.2	0.1	0.3	0.2	
Mass Emission Rate					
(Lb/hr)	0.01	0.01	0.02	0.01	
(Lb/mmBTU)	0.0003	0.0002	0.0005	0.0003	0.038 LBS/1000 GAL
NO_x SAMPLE RESULTS					
Concentration, (ppm_{vd} – bias corrected)	130.5	132.5	133.5	132.2	
Mass Emission Rate					
(Lb/hr)	5.88	6.48	6.78	6.4	
(Lb/mmBTU)	0.1561	0.1606	0.1602	0.1590	20.018 LBS/1000 GAL
CO SAMPLE RESULTS					
Concentration, (ppm_{vd} – bias corrected)	8.3	47.7	35.1	30.4	
Mass Emission Rate					
(Lb/hr)	0.23	1.42	1.08	0.9	
(Lb/mmBTU)	0.0060	0.0352	0.0256	0.0223	2.808 LBS/1000 GALS
VOC SAMPLE RESULTS					
Concentration (ppm_{vw} – bias corrected)[a]	0.0	0.0	0.0	0.0	
Mass Emission Rate					
(Lb/hr)	0.0	0.0	0.0	0.0	
(Lb/mmBTU)	0.0000	0.0000	0.0000	0.0000	0.000

[a] Negative values have been reported as zero.

Flow Rate Determination

EPA RM2, *"Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube),"* was followed to measure the volumetric flow rate at the sample location. RM 2 allows for a stainless steel Type-S or standard pitot tube to be connected to a differential pressure gauge (inclined manometer). The measured pressure differential, observed at each traverse point, was recorded on a field data sheet and used for determining the overall flow rate.

In addition to the velocity head, gas temperatures were measured and recorded concurrently with all the velocity head data. The temperature was measured with a Type-K thermocouple attached to a digital temperature indicator. Temperature readings are recorded from the display of the calibrated digital temperature indicator. The velocity head and temperature data was recorded on field data forms.

The average stack gas velocity was calculated using the gas density, average measured velocity head (differential pressure), and average measured gas temperature. The flow rate results are presented in terms of actual cubic feet per minute (acfm), wet standard cubic feet per minute (wscfm) and dry standard cubic feet per minute (dscfm).

Determination of O_2 and CO_2 Concentrations

EPA RM 3A, *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure),"* was conducted to determine the diluent O_2 and CO_2 concentration of the effluent at the sample location. Oxygen and CO_2 concentrations (%) were determined by CEM using a Servomex Model 1400B Paramagnetic O_2 analyzer and Infrared (IR) CO_2 analyzer. The instrument range for both the O_2 and CO_2 instruments is 0 to 25 percent full-scale.

RM 3A analyzer calibration requirements include: three point calibrations using EPA Protocol 1 gas standards and stringent instrument drift requirements. Calibrations were completed at 80-100 percent of the span value, 40-60 percent of the span value, and zero percent of the span value (ultra-pure nitrogen for both analyzers).

The O_2 and CO_2 analyzers were subjected to a zero and two (2) up-scale calibration gases prior to each set of emission measurements. The gas standards are certified and traceable to EPA Protocol 1 specifications, which require that the gas concentration be within ±1 percent of the documented value. The response of the analyzers compared to each certified calibration standard must be within ±2 percent of the analyzer span value for each component as required by the method.

To calibrate the instruments, the gas standards were introduced directly to the monitors at the sample inlet located on the back of each instrument. The amount of bias of the O_2 and CO_2 CEMs was also determined. This was accomplished by introducing zero and one (1) span gas to the CEMs at the point in which the sample probe and heated sample filter are connected. The response of the analyzers to the direct zero and span gases (bias check) was less than ±5 percent of the span value for each component as required by the method. The bias calibration check was performed prior to and upon completion of each sample run.

The magnitude of calibration drift was also calculated. Calibration drift is the difference in the initial (pre-test) bias calibration response and the final (post-test) bias calibration response for the same gas standard. The calibration drift was within ±3 percent of the span over each sample run for each O_2 and CO_2 gas standard as required by the method.

Moisture Content Determination

The effluent moisture content determination was incorporated into the RM 5 sample train and follows the procedures of *EPA RM 4, "Determination of Moisture Content in Stack Gases."* The determination of moisture content was accomplished using a condenser and pump assembly connected between a sample probe and metering system.

During each sample run, a known volume of gas (measured by a dry gas meter) was passed through the condenser assembly. Upon completion of each sample run, the total amount of condensate collected was gravimetrically measured and the net gain calculated. The total moisture gain, volume of gas extracted, and measured meter temperature data were used to calculate the actual moisture content of the effluent.

Particulate Matter Determination

EPA RM 5, *"Determination of Particulate Emissions From Stationary Sources,"* was performed to determine the particulate concentration and moisture content of the effluent. This was accomplished by the isokinetic extraction of the effluent. A known volume of stack gas (measured by a dry gas meter) was passed through a calibrated stainless steel nozzle, heated stainless steel probe, heated oven (housing a glass filter holder and tared quartz-fiber filter) and condenser assembly. Upon completion of each sample run, the filter was removed from the filter holder and placed in a labeled petri dish, the nozzle, probe and filter holder (front-half) were washed with acetone and collected in a polyethylene storage container. The total amount of condensate collected was gravimetrically measured and the net gain calculated. The total moisture gain, volume of gas extracted and measured dry gas meter temperature data were used to calculate the actual moisture content of the effluent. The total filterable particulate mass gain for each run was determined by placing the acetone wash in a tared beaker and evaporating to dryness. Upon completion of the evaporation process, the tared beakers and filters from each sample run were placed in a desiccating chamber for a minimum of twenty-four hours. At the end of the conditioning period, the filters and beakers were weighed until two consecutive measurements do not deviate by more than ±0.5 milligrams.

Sulfur Dioxide Emission Determination

EPA RM 6C, *"Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)"*, was conducted to determine the SO_2 concentration of the effluent at the outlet. A continuous gas sample was extracted from the stack and directed to the Ametek Model 721 M ultraviolet SO_2 monitor for analysis.

RM 6C analyzer calibration requirements include: three point calibrations using EPA Protocol 1 gas standards and stringent instrument drift requirements. Calibrations were completed at 80-100 percent of the span value, 40-60 percent of the span value, and zero percent of the span value (ultra-pure nitrogen).

The SO_2 analyzer was subjected to a zero and two (2) up-scale calibration gases prior to each set of emission measurements. The gas standards are certified and traceable to EPA Protocol 1 specifications, which require that the gas concentration be within ±1 percent of the documented value. The response of the analyzer compared to each certified calibration standard was within ±2 percent of the analyzer span value for each component as required by the method.

To calibrate the instrument, the gas standards were introduced directly to the monitor at the sample inlet located on the back of the instrument. The amount of bias of the sample system was also determined. This was accomplished by introducing zero and one (1) span gas to the CEMs at the point at which the sample probe and heated sample filter are connected. The response of the analyzer to the direct zero and span gases (bias check) was less than ±5 percent of the span value for each component as required by the method. The bias calibration check was performed prior to and upon completion of each sample run.

The magnitude of calibration drift was also calculated. Calibration drift is the difference in the initial (pre-test) bias calibration response and the final (post-test) bias calibration response for the same gas standard. The calibration drift was within ±3 percent of the span over each sample run for each SO_2 gas standard as required by the method.

Nitrogen Oxide Emission Determination

EPA RM 7E, *"Determination of Nitrogen Oxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)"*, was conducted to determine the NO_x concentration of the effluent at the outlet. A continuous gas sample was extracted from the stack and directed to the TECO Model 42 Chemiluminescent NO_x monitor for analysis.

RM 7E analyzer calibration requirements include: three point calibrations using EPA Protocol 1 gas standards and stringent instrument drift requirements. Calibrations were completed at 80-100 percent of the span value, 40-60 percent of the span value, and zero percent of the span value (ultra-pure nitrogen).

The NO_x analyzer was subjected to a zero and two (2) up-scale calibration gases prior to each set of emission measurements. The gas standards are certified and traceable to EPA Protocol 1 specifications, which require that the gas concentration be within ±1 percent of the documented value. The response of the analyzer compared to each certified calibration standard was within ±2 percent of the analyzer span value for each component as required by the method.

To calibrate the instrument, the gas standards were introduced directly to the monitor at the sample inlet located on the back of the instrument. The amount of bias of the sample system was also determined. This is accomplished by introducing zero and one (1) span gas to the CEMs at the point at which the sample probe and heated sample filter are connected. The response of the analyzer to the direct zero and span gases (bias check) was less than ±5 percent of the span value for each component as required by the method. The bias calibration check was performed prior to and upon completion of each sample run.

The magnitude of calibration drift was also calculated. Calibration drift is the difference in the initial (pre-test) bias calibration response and the final (post-test) bias calibration response for the same gas standard. The calibration drift was within ±3 percent of the span over each sample run for each NO_x gas standard as required by the method.

Carbon Monoxide Emission Determination

EPA RM 10,"Determination of Carbon Monoxide Emissions from Stationary Sources", was used to accomplish the required CO measurements at the sample location. A continuous gas sample was extracted from the stack and directed to the TECO Model 48H NDIR CO monitor for analysis.

Three certified calibration gases were used to calibrate the CO instrument before and after each test series; high-range gas (approximately 60% of span), mid-range gas (approximately 30% of span), and zero gas (ultra-pure nitrogen). The CO calibration gas standards are traceable to EPA Protocol 1 specifications, which require that the CO concentration be within ±1% of the documented value. To calibrate the instrument, the gas standards were introduced directly to the analyzer at the sample inlet located on the back of the instrument. The response of the analyzer compared to each certified calibration standard was within ±2% of the analyzer span value. Although not required by the method, sampling system bias was also determined, following the procedures of RM 6C, by introducing zero and one high-range calibration gas to the sampling system at the point at which the sample probe and heated sample filter are connected. The sampling system bias calibration checks were performed before and after each one-hour sample run. The response of the analyzers to the direct zero and span gases (bias check) were less than ±5 percent of the span value for each component as required by RM 6C. Calibration drift was also documented for each sample run. The zero and upscale drift did not exceed

±3 percent of the span over the period of each one-hour run. Upon completion of the sampling program, all CO data was bias corrected following the procedures of RM 6C, Equation 6C-1.

Determination of Total Hydrocarbon Emissions

RM 25A, "Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer," was followed to quantify the total hydrocarbon emissions, measured as propane (C_3H_8), at the sample location. RM 25A analyzer calibration requirements include four point calibrations using EPA Protocol 1 gas standards and stringent instrument drift requirements. Calibrations are completed at 80-90 percent of the span value, 45-55 percent of the span value, 25-35 percent of the span value, and zero percent of the span value (ultra-pure air). The FID analyzer standards used are traceable to EPA Protocol 1 specifications (±1 percent of documented value).

To calibrate the FID analyzer, zero gas and mid-level calibration gas were introduced directly to the sample inlet located on the back of the instrument. The predicted responses for the low-level and high-level gases were then calculated based on a linear response line between the zero and mid-level responses. The low-level and high-level gases were then introduced to the sample inlet on the back of the instrument and the system responses to each gas recorded. The analyzer calibration error, calculated by determining the difference between the predicted response and the actual instrument response and comparing it to the actual calibration gas value for both the low-level and high-level gases, was within the ±5 percent criteria specified in RM 25A. Although not required by the method, sampling system bias was also determined by introducing zero and one high-range calibration gas to the sampling system at the point at which the sample probe and heated sample filter are connected. The sampling system bias calibration checks were performed before and after each one-hour sample run. Calibration drift was also documented for each sample run. The zero and upscale drift did not exceed ±3 percent of the span over the period of each one-hour run. Upon completion of the sampling program, all FID data was bias corrected following the procedures of RM 6C, equation 6C-1.

The calibration of the FIDs was accomplished using a gas dilution system. RM 205 *"Verification of Gas Dilution Systems for Field Instrument Calibrations,"* was followed to demonstrate that the gas dilution system produced predictable gas concentrations spanning a range of concentrations. The gas dilution system is equipped with mass flow controllers, which allow for dilution of calibration gases using a zero air supply. This method allows for linearity demonstrations in the appropriate instrument range. The verification is accomplished using one calibrated instrument, two dilution gas standards and one protocol gas standard. For the field evaluation, two dilution levels were prepared for each dilution device used, the predicted concentrations calculated and then introduced directly to the analyzer. A minimum of three injections of each dilution level was made to the analyzer and the average of the three injections calculated. No single injection differed by more than ±2% from the average instrument response for that dilution. Additionally, the average concentration output from the analyzer was within ±2% of the predicted value. At this point, an EPA Protocol Gas, with a concentration within 10% of one of the dilution levels tested, was used as an independent check of the dilution system. A minimum of three injections of the Protocol Gas was made directly to the analyzer. The average instrument response was calculated and the difference between the Protocol Gas concentration and the instrument response was within the method requirement of ±2%. Upon satisfactory completion of field evaluation, the dilution system was used for all necessary instrument calibrations for the field program.

The FID response times were determined at the beginning of the first test by following EPA procedures in Method 25A. The response time is determined based on the average of three tests conducted by introducing zero gas into the measurement system at the calibration valve assembly. Once the output has stabilized, a high-level calibration gas is introduced. The response time for each of these tests is the time required for the measurement system to respond to 95 percent of the step change.

Data Acquisition

The primary means of data acquisition was a Campbell Scientific digital data logger utilizing PC-208W software. The data collected by the data logger (one-minute averages) was used for all data reduction and pollutant mass emission rate determinations. The digital data is used to provide greater resolution of measured parameters.

If you have any questions regarding these results, please call at (615) 794-1524. SECOR appreciates the opportunity to provide you with air quality consulting assistance. Thank you for using SECOR.

Sincerely,

SECOR International Incorporated

David S. West
Project Scientist

Jeffrey H. Twaddle, P.E.
Managing Principal

DSW:JHT/caw
Enclosure

Field Data Forms

Method 5 - Particulate Emissions Calculations

Client: Griffin Industries   SECOR Project No.: 017.96270.300

Source: Boiler No. 2   Date: 2/20/2001

	Run 1	Run 2	Run 3		Average
Date	2/20/2001	2/20/2001	2/20/2001		----
Time Began	14:30	17:03	18:45		----
Time Ended	0001	0001	0001		----
Stack Gas					
Temperature, °F	337.1	352.3	350.1		346.5
O_2 Concentration, %	5.1	4.6	4.8		4.8
CO_2 Concentration, %	12.0	12.4	12.2		12.2
CO Concentration, %	0.0	0.0	0.0		0.0
N_2 Concentration, %	82.9	83.0	83.0		83.0
Stack Pressure, P_s	29.81	29.81	29.82		29.8
Moisture Calculations					
Standard Meter Volume, ft³ (Vm_{std})	40.982	44.408	45.699		43.697
Standard Water Volume, ft³ (Vw_{std})	5.140	5.399	5.681		5.407
Moisture Fraction, Saturation	1.00	1.00	1.00		
Moisture Fraction, Measured	0.1114	0.1084	0.1106		0.110
Applicable Moisture (lower Sat. vs. Meas.)	0.1114	0.1084	0.1106		0.110
Volumetric Flow Rate					
Mol. Wt. Stack Gas, (M_s)	28.77	28.85	28.80		28.81
Velocity, (V_s)	42.5	46.9	48.7		46.0
Velocity, (ft/min)	2,552	2,813	2,920		2,762
At Stack Conditions, acfm (Q_a)	10,715	11,811	12,261		11,595
At Wet Standard Conditions, wscfm (Q_{sw})	7,071	7,648	7,963		7,561
At Standard Conditions*, dscfm (Q_s)	6,283	6,819	7,083		6,728
Particulate					
Isokinetic Sampling Rate, %	104	104	103		103
Concentration,					
gr/dscf³	0.008089	0.006111	0.005702		0.00663
mg/dscm³	18.508	13.982	13.047		15.18
Emission Rate,					
lb/hr	0.4356	0.3572	0.3462		0.380
lb/mmBTU	0.0116	0.0089	0.0082		0.010
Permit Limit, gr/ft³	----	----	----	----	

*68 °F, 29.92 in. Hg.

SAMPLE CALCULATIONS

Boiler No. 2
Run 1

I. Meter Pressure (Pm), in. Hg

Pm = Pb + (Delta H)/(13.6 in. H2O/in. Hg)

Pb = barometric pressure, in. Hg
Delta H = pressure differential of orifice, in. H20

Pm = 29.85 in. Hg + 1.525 in. H2O / (13.6 in H2O/in.Hg)

Pm = 29.96

II. Standard Meter Volume (Vmstd), ft^3

$$Vmstd = \frac{17.64\ °R/in.\ Hg \times Y \times Vm \times Pm}{Tm}$$

Y = meter correction factor
Vm = meter volume, ft^3
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.64\ °R/in.\ Hg \times 0.994 \times 42.78\ ft^3 \times 29.96\ in.\ Hg}{88.6 degrees\ F + 460}$$

Vmstd = 40.98 ft^3

III. Standard Wet Volume (Vwstd), ft^3

Vwstd = 0.04707 ft^3/mL x Vlc

Vlc = volume of water collected, mL

Vwstd = 0.04707 ft^3/mL x 109.2 mL = 5.14 ft^3

IV. Moisture Fraction (Measured) (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{5.14\ ft^3}{5.14\ ft^3 + 40.98\ ft^3} = 0.111$$

V. Molecular Weight (Ms), lb/lb-mole

$$Ms = [0.44\ \%CO_2 + 0.32\ \%O_2 + 0.28\ (\%CO + \%N_2)]\ (1 - Bws) + 18\ Bws$$

$$Ms = [(0.44 \times 12.0) + (0.32 \times 5.1) + (0.28 \times (0.0 + 82.9))]$$

$$\times (1 - 0.111) + 18\ (0.111) = 28.8\ lb/lb\text{-}mole$$

SAMPLE CALCULATIONS
(Continued)

VI. Average Velocity (Vs), ft/sec

$$Vs = 85.49 \frac{ft}{sec} \left[\frac{(lb/lb\text{-}mole)(in.\ Hg)}{(°R)(in.\ H2O)}\right]^{1/2} \times Cp \times ((Delta\ P)^{1/2})avg$$

$$\times \left(\frac{Ts}{Ps \times Ms}\right)^{1/2}$$

where, Cp = pitot tube coefficient
Delta P = velocity head of stack gas, in. H2O
Ts = absolute stack temperature, °R
Ps = absolute stack gas pressure, in. Hg
Ms = molecular weight of stack gas

$$Vs = 85.49 \frac{ft}{sec} \left[\frac{(lb/lb\text{-}mole)(in.\ Hg)}{(°R)(in.\ H2O)}\right]^{1/2} \times 0.84 \times 0.6146\ (in.\ H2O)^{1/2}$$

$$\times \left[\frac{796.8\ °R}{29.81\ in.\ Hg \times 28.8\ lb/lb\text{-}mole}\right]^{1/2} = 42.5\ ft/sec$$

VII. Average Stack Gas Flow at Stack Conditions (Qa), acfm

Qa = 60 sec/min x Vs x As where, Vs = stack gas velocity, ft/sec
As = cross-sectional area of stack, ft^2

$$Qa = 60\ sec/min \times 42.5\ ft/sec \times 4.20\ ft^2$$

$$Qa = 1.07E+04 acfm$$

VIII. Average Stack Gas Flow at Wet Standard Conditions (Qsw), wscfm

$$Qsw = 17.64 \frac{°R}{in.\ Hg} \times Qa \times \frac{Ps}{Ts}$$

where, Qa = average stack gas flow at stack conditions, acfm
Ps = absolute stack gas pressure, in. Hg
Ts = absolute stack temperature, °R

$$Qsw = 17.64 \frac{°R}{in.\ Hg} \times 1.07E+04 \frac{ft^3}{min} \times \frac{29.81\ in.\ Hg}{797.1\ °R}$$

$$Qs = 7.07E+03 wscfm$$

SAMPLE CALCULATIONS

(Continued)

IX. Average Stack Gas Flow at Standard Conditions (Qs), ft³/min

$$Qs = 17.64 \frac{°R}{in.\ Hg} \times Qa \times (1 - Bws) \times \frac{Ps}{Ts}$$

where, Qa = average stack gas flow at stack conditions, acfm
Bws = moisture content
Ps = absolute stack gas pressure, in. Hg
Ts = absolute stack temperature, °R

$$Qs = 17.64 \frac{°R}{in.\ Hg} \times 1.07E{+}04 \frac{ft^3}{min} \times (1 - 0.111) \times \frac{29.81\ in.\ Hg}{797.1\ °R}$$

$$Qs = 6.28E{+}03 dscfm$$

X. Percent Isokinetic Sampling Rate (% I)

$$\% I = \frac{0.0945\ (in.\ Hg)(min)/(°R)(sec) \times Ts \times Vmstd}{Ps \times Vs \times An \times @ \times (1 - Bws)}$$

where, Ts = average stack temperature, °R
Vmstd = standard meter volume, ft³
Ps = stack gas pressure, in. Hg
Vs = stack gas velocity, ft/sec
An = cross-sectional area of nozzle, ft²
@ = total sampling time, min
Bws = moisture content

$$\% I = \frac{0.0945\ (in.\ Hg)(min)/(°R)(sec) \times 797.1\ °R \times 40.982\ ft^3}{29.81\ in.\ Hg \times 42.5\ ft/sec \times 4.12E{-}04\ ft^2 \times 2\ min \times (1 - 0.111)}$$

$$\% I = 104$$

XI. Particulate Concentration at Standard Conditions (Cs), gr/dscf

$$Cs = 15.43 \frac{gr}{g} \times \frac{Mn}{Vmstd}$$

where, Mn = particulate matter collected, g
Vmstd = standard meter volume, ft³

$$Cs = 15.43 \frac{gr}{g} \times \frac{0.0215\ g}{40.982\ ft^3} = 0.008\ gr/dscf$$

SAMPLE CALCULATIONS
(Continued)

XI. Particulate Concentration at Standard Conditions, mg/dscm

$$mg/dscm = Cs \frac{gr}{dscf} \times \frac{64.80\ mg}{gr} \times \frac{1\ ft^3}{0.02832\ m^3}$$

$$mg/dscm = 0.008 \frac{gr}{dscf} \times \frac{64.80\ mg}{gr} \times \frac{1\ ft^3}{0.02832\ m^3} = 18.508 mg/dscm$$

XII. Particulate Emission Rate (PMR), lb/hr

$$PMR = \frac{Cs \times Qs \times 60\ min/hr}{7000\ gr/lb}$$

where, Cs = particulate concentration at standard conditions, gr/ft^3
Qs = average stack gas flow at standard conditions, ft^3/min

$$PMR = \frac{0.008\ gr/ft^3 \times 6.28E+03\ ft^3/min \times 60\ min/hr}{7000\ gr/lb}$$

PMR = 0.4 lb/hr

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RM 1 PARTICULATE VELOCITY TRAVERSE - FIELD SAMPLING DATA

Plant: Griffin Industries
Location: Union City - TN
Source I.D.: Boiler-2
Date: 2-20-2001
Operator(s): JM

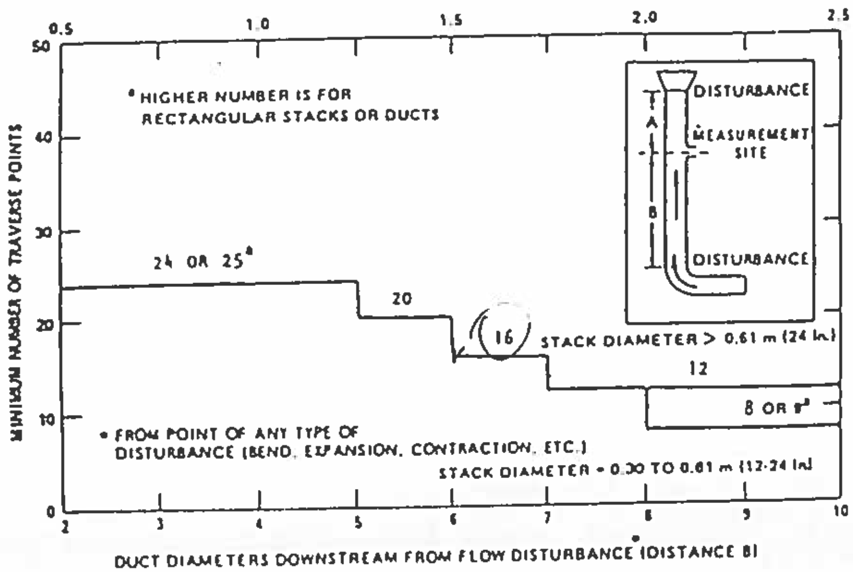
Stack Dia.: ~~80"~~ 27.75
Port Dia.: 4"
Port Depth: 5 7/8"
Upstream A (in): 107 (3.86DD)
Downstream B (in): 51RL 120URL (6.16DD) 171

Number of Traverse Points on a Diameter

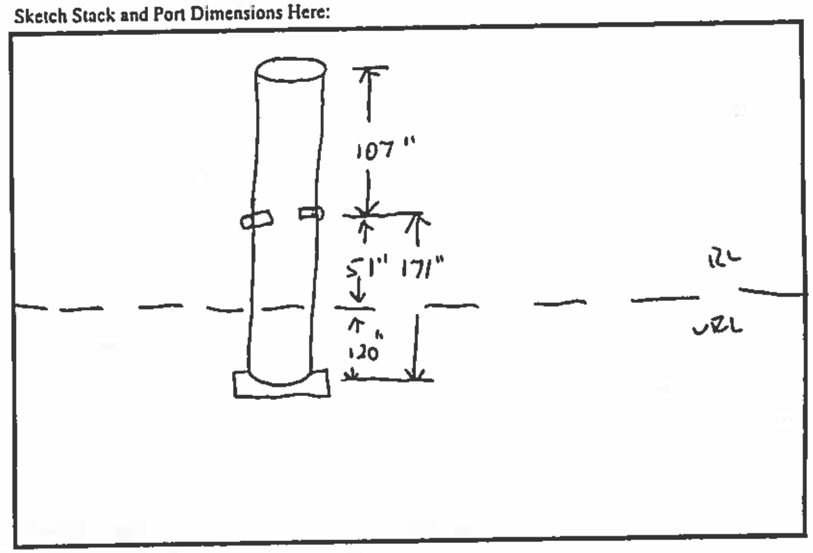
Point No.	2	4	6	8	10	12
1	14.6	6.7	4.4	3.2	2.6	2.1
2	85.4	25.0	14.6	10.5	8.2	6.7
3		75.0	29.6	19.4	14.6	11.8
4		93.3	70.4	32.3	22.6	17.7
5			85.4	67.7	34.2	25.0
6			95.6	80.6	65.6	35.6
7				89.5	77.4	64.4
8				96.8	85.4	75.0
9					91.8	82.3
10					97.4	88.2
11						93.3
12						97.9

Point Number	Distance From Wall (in)	Distance with Port (in)
1	0.9	6.8
2	2.9	8.8
3	5.4	11.3
4	9.0	14.9
5	18.8	24.7
6	22.4	28.3
7	24.8	30.7
8	26.9	32.8

5.4



Sketch Stack and Port Dimensions Here:



47.8 cu ft

SECOR

SAMPLE DATA FORM

Plant: Grifin Industries
Location: Union City - TN
Source I.D.:
Date: 2-20-01
Flow Traverse Time: ~~4:58~~ 13:30
Run No.: Pre
Operators: JM / AC
Meter Box I.D.: 3
Meter Y:
Meter Delta H@:
Probe I.D.:
Probe Length/Type: 4ft / S-type
Pitot Coeff. (Cp): 0.84

Filter ID:
Ambient Temp. (°F):
Baro. Press. (in. Hg):
Static Press. (in H_2O): -0.64
O_2 (%):
CO_2 (%):
Duct Dia. (in): 27.75"
B_{ws} (assumed):
Nozzle Dia. (in): ~~0.235~~ 0.275
K Factor: ~~2.15~~ 4.03
Leak Check:
Pre: ______ acf/60 sec @ ______ in. Hg Vac.
Post: ______ acf/60 sec @ ______ in. Hg Vac.

Pitot: Impact Static
Pre: ______ in. H_2O/15 sec.
Post: ______ in. H_2O/15 sec.

Moisture

Imp.	Initial	Final
1	744.4	
2	658.1	
3	562.1	
4	799.6	
5		
Net Gain		

2.35
2.34
2.35

DGM Clock Time	Port/Point I.D.	Sample Time (min.)	DGM Reading (DACF)	ΔP (in. H_2O)	ΔH (in. H_2O)	Stack Temp. (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Imp. Outlet Temp. (°F)	DGM Temp. (°F)		Vacuum (in. Hg)
	A1			~~0.03~~	1.5	186	~~[illegible]~~	~~244~~	0.03	129		
	2			~~0.04~~			~~0.49~~	~~308~~	0.46	268		
	3			~~0.04~~			~~0.54~~	~~335~~	0.51	304		
	4			~~0.04~~			~~0.54~~	~~343~~	0.53	324		
	5			~~0.04~~			~~0.54~~	~~348~~	0.54	337		
	6			~~0.04~~			~~0.57~~	~~351~~	0.54	344		
	7			~~0.04~~			~~0.58~~	~~353~~	0.53	348		
	8			~~0.04~~			~~0.59~~	~~354~~	0.56	351		
	B1			~~0.04~~					0.08	228		
	2								0.46	315		
	3								0.51	335		
	4								0.53	347		
	5								0.54	350		
	6								0.53	353		
	7								0.56	354		
	8								0.56	354		

Total Time	Vol. (DACF)	Avg. √ΔP	Avg. ΔH	Avg. t_s

Average DGM Temp.	Max. Vac.

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SECOR

SAMPLE DATA FORM

Plant: Griffin Industries
Location: Union City - TN
Source I.D.: Boiler -
Date: 2-20-2001
Flow Traverse Time:
Run No.: 1
Operators: JM / AC
Meter Box I.D.: 3
Meter Y: 0.994
Meter Delta H@: 1.902
Probe I.D.:
Probe Length/Type: 4Ft / S-TYPE
Pitot Coeff. (Cp): 0.84

Filter ID: A1
Ambient Temp. (°F): 68
Baro. Press. (in. Hg): 29.85
Static Press. (in H_2O): -0.56
O_2 (%): 5.1
CO_2 (%): 12.0
Duct Dia. (in): 27.75
B_{ws} (assumed): 5%
Nozzle Dia. (in): 0.275
K Factor: 4.03
Leak Check:
Pre: 0.005 acf/60 sec @ 14 in. Hg Vac.
Post: 0.001 acf/60 sec @ 8 in. Hg Vac.

Pitot:	Impact	Static	
Pre:	0.0	0.0	in. H_2O/15 sec.
Post:	Did Not Pass		in. H_2O/15 sec.

Moisture

Imp.	Initial	Final
1	744.4	817.0
2	658.1	678.8
3	562.1	566.8
4	799.6	810.8
5		
Net Gain		109.2

DGM Clock Time	Port/Point I.D.	Sample Time (min.)	DGM Reading (DACF)	ΔP (in. H_2O)	ΔH (in. H_2O)	Stack Temp. (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Imp. Outlet Temp. (°F)	DGM Temp. (°F)		Vacuum (in. Hg)
14:30	A1	0	708.469	0.30	1.21	242	200	244	67	87	88	3
	2	4		0.34	1.37	292	248	244	56	87	86	3
	3	8	713.54	0.37	1.49	335	248	249	53	86	87	3
	4	12	716.27	0.36	1.53	354	248	246	52	89	88	3
	5	16	718.97	0.39	1.57	351	246	249	51	90	86	3.5
	6	20	721.65	0.39	1.57	354	248	246	52	90	86	3.5
	7	24	724.34	0.41	1.65	356	248	252	52	91	86	4
	8	28	727.10	0.42	1.64	356	248	247	52	92	86	4
	B1	32	729.86	0.28	1.13	278	248	250	57	90	86	3
	2	36	732.18	0.37	1.49	343	248	247	54	91	86	4
	3	40	734.56	0.40	1.61	353	247	248	53	91	87	4
	4	44	737.63	0.41	1.65	356	248	250	53	92	86	4
	5	48	740.39	0.40	1.61	355	218	249	54	92	87	4
	6	52	743.08	0.40	1.61	357	247	248	55	93	87	4
	7	56	745.76	0.40	1.61	355	245	248	56	93	87	4
	8	60	748.46	0.40	1.61	354	248	251	57	94	87	5
1534		64	751.250									

	Total Flow	Port 1 Flow
Qa =	10.320	11.448
Qs =	6.284	6.711
Iso =	104%	97%
Bws =	11.14	11.14
Qsd =	7.072	

Total Time	Vol. (DACF)	Avg. √ΔP	Avg. ΔH	Avg. t_s
64	42.781	0.6146	1.525	337.1

Average DGM Temp.	Max. Vac.
88.6	5

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SECOR

SAMPLE DATA FORM

Plant:	Griffen Industries	Filter ID:	A2
Location:	Union City-TN	Ambient Temp. (°F):	65
Source I.D.:	Boiler #2	Baro. Press. (in. Hg):	29.85
Date:	2-20-2001	Static Press. (in H_2O):	-0.48
Flow Traverse Time:		O_2 (%):	4.6
Run No.:	2	CO_2 (%):	12.4
Operators:	JM/AC	Duct Dia. (in):	27.75
Meter Box I.D.:	3	B_{ws} (assumed):	4%
Meter Y:	0.994	Nozzle Dia. (in):	0.275
Meter Delta H@:	1.902	K Factor:	4.03
Probe I.D.:			
Probe Length/Type:	4ft / S-type		
Pitot Coeff. (Cp):	0.84		

Leak Check:
Pre: 0.01 acf/60 sec @ 8/10 in. Hg Vac.
Post: 0.00 acf/60 sec @ 4 in. Hg Vac.

Pitot:	Impact	Static	
Pre:	0.0	0.0	in. H_2O/15 sec.
Post:	0.0	0.0	in. H_2O/15 sec.

Moisture

Imp.	Initial	Final
1	817.0	904.2
2	678.8	696.8
3	566.8	569.2
4	810.8	819.4
5		
	Net Gain	114.7

DGM Clock Time	Port/Point I.D.	Sample Time (min.)	DGM Reading (DACF)	ΔP (in. H_2O)	ΔH (in. H_2O)	Stack Temp. (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Imp. Outlet Temp. (°F)	DGM Temp. (°F)	DGM Temp. (°F)	Vacuum (in. Hg)
~~17:00~~	A1	0	751.569	0.40	1.61	297	248	218	65	83	83	3
17:03	2	4	754.39	0.43	1.73	~~248~~ 348	248	244	55	82	82	3
	3	8	757.22	0.45	1.81	352	248	248	54	82	81	3.5
	4	12	760.14	0.46	1.85	358	247	251	53	81	83	3.5
	5	16	763.04	0.46	1.85	359	250	248	55	81	84	3.5
	6	20	765.92	0.46	1.85	362	248	254	55	85	81	3.5
	7	24	768.88	0.48	1.93	363	248	250	56	86	81	4
	8	28	771.77	0.48	1.93	362	248	249	56	87	81	4
	B1	32	774.728	0.41	1.65	331	239	249	54	86	81	4
	2	36	777.53	0.41	1.65	351	244	251	58	87	81	4
	3	40	780.31	0.45	1.81	356	242	246	57	88	82	4
	4	44	783.18	0.45	1.81	360	243	250	57	87	81	5
	5	48	786.03	0.47	1.84	360	242	250	58	87	81	5
	6	52	788.90	0.46	1.85	361	242	254	58	87	81	5
	7	56	791.70	0.48	1.93	359	240	252	60	89	81	5
	8	60	794.57	0.48	1.93	358	242	248	60	88	81	
		64	797.497									

Q_a = 11,815
Q_{sw} = 7,651
Q_s = 6,822
T_{sw} = 104
B_{ws} = 0.1084

Total Time	Vol. (DACF)	Avg. √ΔP	Avg. ΔH	Avg. t_s
64	45.888	0.6719	1.82	352.3

Average DGM Temp.	Max. Vac.
83.5	5

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SECOR

SAMPLE DATA FORM

Plant: Griffin Industries
Location: Union City - TN
Source I.D.: Broiler 2
Date: 2-10-2001
Flow Traverse Time:
Run No.: 3
Operators: JM/AL
Meter Box I.D.: 3
Meter Y: 0.994
Meter Delta H@: 1.902
Probe I.D.:
Probe Length/Type: 4FT / STYPE
Pitot Coeff. (Cp): 0.84

Filter ID: A-3
Ambient Temp. (°F): 56
Baro. Press. (in. Hg): 29.85
Static Press. (in H_2O): -0.38
O_2 (%): 4.9
CO_2 (%): 12.2
Duct Dia. (in): 27.75
B_{ws} (assumed): 4%
Nozzle Dia. (in): 0.275
K Factor: 4.03

Leak Check:
Pre: 0.0 acf/60 sec @ 10 in. Hg Vac.
Post: 0.0 acf/60 sec @ 11 in. Hg Vac.

Pitot: Impact / Static
Pre: 0.0 / 0.0 in. H_2O/15 sec.
Post: 0.0 / 0.0 in. H_2O/15 sec.

Moisture

Imp.	Initial	Final
1	904.2	967.5
2	696.8	~~7~~735.2
3	567.2	572.8
4	419.9	833.3
5		
Net Gain		120.7

DGM Clock Time	Port/Point I.D.	Sample Time (min.)	DGM Reading (DACF)	ΔP (in. H_2O)	ΔH (in. H_2O)	Stack Temp. (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Imp. Outlet Temp. (°F)	DGM Temp. (°F)	DGM Temp. (°F)	Vacuum (in. Hg)
18:45	A1	0	797.612	0.34	1.37	245	248	227	66	78	78	3
	2	4	800.11	0.39	1.57	313	248	249	59	80	78	3
	3	8	802.91	0.46	1.65	347	240	251	55	81	79	4
	4	12	805.75	0.48	1.93	360	241	252	56	82	78	4
	5	16	808.69	0.51	2.03	360	248	250	58	83	79	5
	6	20	811.69	0.52	2.10	361	245	249	60	84	79	5
	7	24		0.54	2.18	361	240	247	62	86	79	5
	8	28	817.69	0.54	2.18	359	235	251	63	86	78	5
	B1	32	821.940	0.47	1.89	347	242	249	65	84	79	5
	2	36	823.91	0.50	2.02	352	242	251	66	85	76	5
	3	40	826.89	0.51	2.05	353	232	247	67	85	79	5
	4	44	829.90	0.51	2.05	356	230	251	69	85	79	5
	5	48	832.20	0.51	2.05	359	248	250	69	86	79	5
	6	52	835.67	0.50	2.02	358	249	248	69	86	79	5
	7	56	838.64	0.51	2.05	358	249	248	69	86	79	5
	8	60	841.54	0.53	2.14	363	248	250	68	86	79	6
19:52		64	844.35									
					Qa	12,265						
					Qstd	7966						
					Qs	7,095						
					Iso	103						
					Bws	~~11.06~~	0.1106					

Total Time	Vol. (DACF)	Avg. √ΔP	Avg. ΔH	Avg. t_s
64	47.023	0.6980	1.97	350.6

Average DGM Temp.	Max. Vac.
81.4	6

SECOR
ANALYZER CALIBRATION DATA

CLIENT: Griffin Industries
LOCATION: Union City, TN
SOURCE I.D.: No. 2 Boiler - Waste Cooking Oil
OPERATOR: DSW

DATE: February 20, 2001
INITIAL CAL ITIME: 9:07
FINAL CAL TIME: 20:25

NO_x Method 7E

INITIAL SYSTEM CALIBRATION — Span Value: 200

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air	0.00	-0.34	0.34	0	2
MID-RANGE	40 - 60%	44.50	44.30	0.20	0	2
HIGH-RANGE	80 - 100%	90.50	91.00	0.50	0	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2 or Air	0.00	-0.14	0.14	0	2
MID-RANGE	40 - 60%	44.50	44.70	0.20	0	2
HIGH-RANGE	80 - 100%	90.50	91.80	1.30	1	2

CO Method 10

INITIAL SYSTEM CALIBRATION — Span Value: 500

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air	0.00	-1.00	1.00	0	2
MID-RANGE	40 - 60%	165.60	163.60	2.00	0	2
HIGH-RANGE	80 - 100%	303.00	303.90	0.90	0	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2 or Air	0.00	-2.70	2.70	1	2
MID-RANGE	40 - 60%	165.60	163.10	2.50	1	2
HIGH-RANGE	80 - 100%	303.00	302.10	0.90	0	2

THC Method 25A

INITIAL SYSTEM CALIBRATION — Span Value: 100

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Predicted Response (ppm)	Actual Difference* (%)	Allowed Difference (%)
ZERO	Zero Air	0.00	0.03	---	---	NA
LOW-RANGE	25 - 35%	30.00	29.80	30.43	2.1	5
MID-RANGE	45 - 55%	50.40	51.10	---	---	NA
HIGH-RANGE	80 - 90%	83.60	84.50	84.74	0.3	5
FINAL SYSTEM CALIBRATION						
ZERO	Zero Air	0.00	-0.14	---	---	NA
LOW-RANGE	25 - 35%	31.40	30.30	30.37	0.2	5
MID-RANGE	45 - 55%	51.30	49.70	---	---	NA
HIGH-RANGE	80 - 90%	87.80	87.00	85.16	2.1	5

O_2 Method 3A

INITIAL SYSTEM CALIBRATION — Span Value: 25

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2	0.00	0.02	0.02	0	2
MID-RANGE	40 - 60%	12.10	12.30	0.20	1	2
HIGH-RANGE	80 - 100%	20.00	20.40	0.40	2	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2	0.00	-0.07	0.07	0	2
MID-RANGE	40 - 60%	12.10	12.23	0.13	1	2
HIGH-RANGE	80 - 100%	20.00	20.35	0.35	1	2

CO_2 Method 3A

INITIAL SYSTEM CALIBRATION — Span Value: 25

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2	0.00	0.02	0.02	0	2
MID-RANGE	40 - 60%	12.00	11.91	0.09	0	2
HIGH-RANGE	80 - 100%	20.30	20.34	0.04	0	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2	0.00	-0.14	0.14	1	2
MID-RANGE	40 - 60%	12.00	11.91	0.09	0	2
HIGH-RANGE	80 - 100%	20.30	20.25	0.05	0	2

SO_2 Method 6C

INITIAL SYSTEM CALIBRATION — Span Value: 100

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air	0.00	0.00	0.00	0	2
MID-RANGE	40 - 60%	54.70	56.40	1.70	1	2
HIGH-RANGE	80 - 100%	92.06	92.40	0.34	0	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2 or Air	0.00	-1.20	1.20	1	2
MID-RANGE	40 - 60%	54.70	54.80	0.10	0	2
HIGH-RANGE	80 - 100%	92.06	90.50	1.56	1	2

* Per Method 25A the actual difference is calculated using the predicted resonse of the instrument based on the linear response of the zero and span gases.

SECOR
CEMS BIAS DATA

CLIENT: Griffin Industries
LOCATION: Union City, TN
SOURCE I.D.: No. 2 Boiler - Waste Cooking Oil

DATE: February 20, 2001
OPERATOR: DSW

NOx Method 7E

Span Value: 200

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	-0.34	0.07	0	-1.10	0	5	1	3
BIAS GAS	44.30	43.10	1	42.40	1	5	0	3
Run 2								
ZERO	-0.34	-1.10	0	-0.14	0	5	0	3
BIAS GAS	44.30	42.40	1	42.79	1	5	0	3
Run 3								
ZERO	-0.34	-0.14	0	-1.10	0	5	0	3
BIAS GAS	44.30	42.79	1	43.20	1	5	0	3

CO Method 10

Span Value: 500

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	-1.00	-1.40	0	-1.00	0	5	0	3
BIAS GAS	163.60	162.30	0	159.90	1	5	0	3
Run 2								
ZERO	-1.00	-1.00	0	-3.00	0	5	0	3
BIAS GAS	163.60	159.90	1	159.60	1	5	0	3
Run 3								
ZERO	-1.00	-3.00	0	0.68	0	5	1	3
BIAS GAS	163.60	159.60	1	161.40	0	5	0	3

THC Method 25A

Span Value: 100

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.03	0.02	0	-0.03	0	5	0	3
BIAS GAS	51.10	51.70	1	53.20	2	5	2	3
Run 2								
ZERO	0.03	-0.03	0	-0.15	0	5	0	3
BIAS GAS	51.10	53.20	2	50.30	1	5	3	3
Run 3								
ZERO	0.03	-0.15	0	-0.09	0	5	0	3
BIAS GAS	51.10	50.30	1	49.00	2	5	1	3

O_2 Method 3A

Span Value: 25

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.02	0.08	0	0.03	0	5	0	3
BIAS GAS	12.30	12.26	0	12.14	1	5	0	3
Run 2								
ZERO	0.02	0.03	0	-0.02	0	5	0	3
BIAS GAS	12.30	12.14	1	12.16	1	5	0	3
Run 3								
ZERO	0.02	-0.02	0	0.08	0	5	0	3
BIAS GAS	12.30	12.16	1	12.19	0	5	0	3

CO_2 Method 3A

Span Value: 25

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.02	0.19	1	0.20	1	5	0	3
BIAS GAS	11.91	12.21	1	12.00	0	5	1	3
Run 2								
ZERO	0.02	0.20	1	0.15	1	5	0	3
BIAS GAS	11.91	12.00	0	12.06	0	5	0	3
Run 3								
ZERO	0.02	0.15	1	-0.02	0	5	1	3
BIAS GAS	11.91	12.06	1	11.78	0	5	1	3

SO_2 Method 6C

Span Value: 100

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.00	0.47	0	1.15	1	5	0	3
BIAS GAS	56.40	53.50	1	52.50	2	5	1	3
Run 2								
ZERO	-0.34	1.15	1	-0.34	0	5	1	3
BIAS GAS	44.30	52.50	4	51.50	4	5	1	3
Run 3								
ZERO	-0.34	-0.34	0	0.07	0	5	0	3
BIAS GAS	44.30	51.50	4	51.20	3	5	0	3

Run 1
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (CST)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% - Bias Corr.)
1435	0.7	-0.1	0.00	0.00	124.6	128.7	5.79	0.15	7.6	8.9	0.24	0.01	0.00	0.0	0.00	0.00	5.13	5.05	12.12	12.02
1436	0.8	0.0	0.00	0.00	125.2	129.3	5.82	0.15	9.4	10.8	0.30	0.01	-0.01	0.0	0.00	0.00	5.10	5.02	12.17	12.07
1437	0.8	0.0	0.00	0.00	126.1	130.2	5.86	0.16	9.1	10.5	0.29	0.01	0.02	0.0	0.00	0.00	5.12	5.05	12.17	12.07
1438	0.9	0.1	0.01	0.00	125.4	129.5	5.83	0.15	7.2	8.5	0.23	0.01	-0.02	0.0	0.00	0.00	5.13	5.06	12.20	12.10
1439	0.8	0.0	0.00	0.00	125.5	129.6	5.84	0.15	6.6	8.0	0.22	0.01	-0.02	0.0	0.00	0.00	5.15	5.08	12.20	12.10
1440	0.9	0.1	0.01	0.00	125.4	129.5	5.83	0.15	9.9	11.4	0.31	0.01	0.01	0.0	0.00	0.00	5.16	5.09	12.21	12.11
1441	0.9	0.1	0.00	0.00	125.2	129.3	5.82	0.15	6.3	7.7	0.21	0.01	0.01	0.0	0.00	0.00	5.12	5.05	12.25	12.15
1442	0.9	0.1	0.01	0.00	125.4	129.5	5.83	0.15	7.2	8.6	0.24	0.01	0.00	0.0	0.00	0.00	5.15	5.07	12.26	12.16
1443	0.9	0.1	0.01	0.00	125.4	129.5	5.83	0.15	7.4	8.8	0.24	0.01	0.00	0.0	0.00	0.00	5.21	5.13	12.19	12.09
1444	0.9	0.1	0.00	0.00	125.3	129.4	5.83	0.15	6.4	7.7	0.21	0.01	-0.01	0.0	0.00	0.00	5.23	5.15	12.17	12.07
1445	0.9	0.1	0.01	0.00	125.4	129.5	5.83	0.15	8.4	9.7	0.27	0.01	0.01	0.0	0.00	0.00	5.12	5.04	12.23	12.13
1446	1.0	0.2	0.01	0.00	125.6	129.7	5.84	0.16	12.7	14.2	0.39	0.01	0.00	0.0	0.00	0.00	5.10	5.03	12.23	12.13
1447	1.0	0.2	0.01	0.00	126.1	130.2	5.86	0.16	8.8	10.2	0.28	0.01	0.01	0.0	0.00	0.00	5.06	4.98	12.24	12.14
1448	1.0	0.1	0.01	0.00	126.2	130.3	5.87	0.16	10.6	12.1	0.33	0.01	0.00	0.0	0.00	0.00	5.10	5.03	12.20	12.10
1449	0.9	0.1	0.01	0.00	126.1	130.2	5.86	0.16	9.0	10.4	0.28	0.01	-0.01	0.0	0.00	0.00	5.09	5.02	12.18	12.08
1450	1.0	0.2	0.01	0.00	126.2	130.3	5.87	0.16	6.7	8.0	0.22	0.01	-0.01	0.0	0.00	0.00	5.08	5.01	12.17	12.07
1451	1.0	0.2	0.01	0.00	126.7	130.8	5.89	0.16	5.6	6.9	0.19	0.01	-0.01	0.0	0.00	0.00	5.07	4.99	12.15	12.05
1452	0.9	0.1	0.01	0.00	126.8	130.9	5.90	0.16	6.6	8.0	0.22	0.01	-0.03	0.0	0.00	0.00	5.13	5.05	12.10	11.99
1453	0.9	0.1	0.01	0.00	126.5	130.6	5.88	0.16	8.3	9.7	0.27	0.01	-0.03	0.0	0.00	0.00	5.14	5.06	12.07	11.96
1454	1.1	0.3	0.02	0.00	126.7	130.8	5.89	0.16	8.1	9.4	0.26	0.01	0.00	0.0	0.00	0.00	5.10	5.03	12.08	11.97
1455	1.1	0.3	0.02	0.00	127.1	131.3	5.91	0.16	6.9	8.2	0.23	0.01	0.00	0.0	0.00	0.00	5.09	5.01	12.06	11.95
1456	1.0	0.2	0.01	0.00	127.0	131.2	5.91	0.16	8.6	10.0	0.27	0.01	-0.01	0.0	0.00	0.00	5.07	5.00	12.07	11.96
1457	1.0	0.2	0.01	0.00	126.8	130.9	5.90	0.16	8.4	9.8	0.27	0.01	-0.01	0.0	0.00	0.00	5.10	5.02	12.05	11.94
1458	0.9	0.1	0.01	0.00	127.0	131.2	5.91	0.16	5.7	7.1	0.19	0.01	-0.09	-0.1	0.00	0.00	5.14	5.07	12.03	11.92
1459	1.0	0.2	0.01	0.00	126.7	130.8	5.89	0.16	5.3	6.7	0.18	0.00	-0.14	-0.1	-0.01	0.00	5.13	5.05	12.04	11.93
1500	1.0	0.2	0.01	0.00	126.8	130.9	5.90	0.16	6.2	7.5	0.21	0.01	-0.14	-0.1	-0.01	0.00	5.09	5.02	12.06	11.95
1501	1.0	0.2	0.01	0.00	127.2	131.4	5.92	0.16	8.1	9.5	0.26	0.01	-0.14	-0.1	-0.01	0.00	5.13	5.05	12.03	11.92
1502	1.0	0.2	0.01	0.00	126.5	130.6	5.88	0.16	9.7	11.1	0.30	0.01	-0.13	-0.1	-0.01	0.00	5.11	5.04	12.03	11.92
1503	1.1	0.3	0.02	0.00	126.8	130.9	5.90	0.16	7.7	9.1	0.25	0.01	-0.12	-0.1	-0.01	0.00	5.08	5.00	12.05	11.94
1509	1.1	0.3	0.02	0.00	126.2	130.3	5.87	0.16	5.4	6.8	0.19	0.00	-0.01	0.0	0.00	0.00	5.17	5.10	11.97	11.86
1510	1.0	0.2	0.01	0.00	126.1	130.2	5.86	0.16	5.8	7.1	0.20	0.01	-0.02	0.0	0.00	0.00	5.14	5.07	11.99	11.88
1511	1.1	0.3	0.02	0.00	126.4	130.5	5.88	0.16	5.5	6.9	0.19	0.01	-0.03	0.0	0.00	0.00	5.14	5.07	12.00	11.89
1512	1.1	0.3	0.02	0.00	126.5	130.6	5.88	0.16	6.4	7.8	0.21	0.01	-0.03	0.0	0.00	0.00	5.15	5.07	11.98	11.87
1513	1.1	0.3	0.02	0.00	126.9	131.1	5.90	0.16	5.8	7.2	0.20	0.01	0.01	0.0	0.00	0.00	5.16	5.09	11.97	11.86
1514	1.1	0.3	0.02	0.00	126.5	130.6	5.88	0.16	8.5	9.9	0.27	0.01	0.01	0.0	0.00	0.00	5.10	5.03	12.03	11.92
1515	1.1	0.3	0.02	0.00	127.3	131.5	5.92	0.16	5.2	6.5	0.18	0.00	0.02	0.0	0.00	0.00	5.08	5.00	12.05	11.94
1516	1.1	0.3	0.02	0.00	127.1	131.3	5.91	0.16	4.2	5.5	0.15	0.00	-0.02	0.0	0.00	0.00	5.19	5.11	11.97	11.86
1517	1.1	0.3	0.02	0.00	126.7	130.8	5.89	0.16	5.4	6.7	0.18	0.00	-0.01	0.0	0.00	0.00	5.14	5.06	12.01	11.90
1518	1.1	0.3	0.02	0.00	126.5	130.6	5.88	0.16	5.8	7.2	0.20	0.01	-0.03	0.0	0.00	0.00	5.14	5.07	12.01	11.90
1519	1.1	0.3	0.02	0.00	126.6	130.7	5.89	0.16	6.0	7.4	0.20	0.01	-0.03	0.0	0.00	0.00	5.18	5.11	11.98	11.87
1520	1.1	0.3	0.02	0.00	125.9	130.0	5.85	0.16	7.3	8.7	0.24	0.01	-0.04	0.0	0.00	0.00	5.23	5.15	11.93	11.82
1521	1.1	0.3	0.02	0.00	125.9	130.0	5.85	0.16	5.1	6.4	0.18	0.00	-0.03	0.0	0.00	0.00	5.24	5.16	11.95	11.84
1522	1.0	0.2	0.01	0.00	126.1	130.2	5.86	0.16	5.3	6.6	0.18	0.00	-0.03	0.0	0.00	0.00	5.21	5.13	11.98	11.87
1523	0.9	0.1	0.01	0.00	126.2	130.3	5.87	0.16	7.9	9.3	0.25	0.01	-0.02	0.0	0.00	0.00	5.24	5.16	11.96	11.85
1524	0.9	0.1	0.00	0.00	126.3	130.4	5.87	0.16	8.3	9.7	0.27	0.01	-0.03	0.0	0.00	0.00	5.24	5.17	11.96	11.85
1525	0.9	0.1	0.01	0.00	127.1	131.3	5.91	0.16	4.5	5.8	0.16	0.00	0.01	0.0	0.00	0.00	5.17	5.09	12.01	11.90

Run 1
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (CST)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% - Bias Corr.)
1526	0.9	0.1	0.01	0.00	127.2	131.4	5.92	0.16	5.4	6.7	0.18	0.00	-0.01	0.0	0.00	0.00	5.19	5.11	12.01	11.90
1527	0.9	0.1	0.00	0.00	126.6	130.7	5.89	0.16	4.3	5.6	0.15	0.00	-0.01	0.0	0.00	0.00	5.20	5.12	12.01	11.90
1528	0.9	0.1	0.01	0.00	127.2	131.4	5.92	0.16	6.2	7.5	0.21	0.01	-0.01	0.0	0.00	0.00	5.16	5.09	12.05	11.94
1529	1.0	0.2	0.01	0.00	127.4	131.6	5.92	0.16	8.9	10.3	0.28	0.01	0.00	0.0	0.00	0.00	5.24	5.16	12.00	11.89
1530	1.0	0.2	0.01	0.00	127.3	131.5	5.92	0.16	5.9	7.3	0.20	0.01	-0.01	0.0	0.00	0.00	5.23	5.16	12.03	11.92
1531	0.9	0.1	0.01	0.00	126.8	130.9	5.90	0.16	4.4	5.7	0.16	0.00	-0.02	0.0	0.00	0.00	5.19	5.12	12.09	11.98
1532	0.9	0.1	0.01	0.00	127.4	131.6	5.92	0.16	6.7	8.1	0.22	0.01	0.00	0.0	0.00	0.00	5.16	5.08	12.12	12.02
1533	0.9	0.1	0.01	0.00	126.8	130.9	5.90	0.16	7.6	9.0	0.25	0.01	-0.02	0.0	0.00	0.00	5.24	5.17	12.08	11.97
1534	1.0	0.2	0.01	0.00	127.0	131.2	5.91	0.16	7.0	8.3	0.23	0.01	0.01	0.0	0.00	0.00	5.22	5.14	12.13	12.03
1535	0.9	0.1	0.00	0.00	126.9	131.1	5.90	0.16	5.2	6.5	0.18	0.00	-0.03	0.0	0.00	0.00	5.25	5.17	12.12	12.02
1536	0.9	0.1	0.00	0.00	126.6	130.7	5.89	0.16	4.7	6.0	0.16	0.00	-0.02	0.0	0.00	0.00	5.28	5.20	12.11	12.01
1537	0.9	0.1	0.01	0.00	126.0	130.1	5.86	0.16	8.9	10.3	0.28	0.01	-0.02	0.0	0.00	0.00	5.24	5.17	12.14	12.04
1538	0.9	0.1	0.01	0.00	125.7	129.8	5.85	0.16	5.2	6.6	0.18	0.00	-0.02	0.0	0.00	0.00	5.24	5.16	12.17	12.07
1539	1.0	0.2	0.01	0.00	126.4	130.5	5.88	0.16	4.1	5.4	0.15	0.00	0.00	0.0	0.00	0.00	5.25	5.18	12.18	12.08
Ave	0.97	0.17	0.01	0.0003	126.39	130.53	5.88	0.1561	6.92	8.29	0.23	0.0060	-0.02	-0.02	0.00	0.0000	5.16	5.08	12.08	11.98

Run 2
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (EDT)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% - Bias Corr.)
1704	0.5	0.1	0.01	0.00	129.2	133.7	6.53	0.16	29.6	32.4	0.96	0.02	-0.14	0.0	0.00	0.00	4.68	4.66	12.44	12.42
1705	0.6	0.2	0.01	0.00	128.8	133.3	6.51	0.16	31.7	34.5	1.03	0.03	-0.14	0.0	0.00	0.00	4.69	4.67	12.42	12.39
1706	0.5	0.1	0.01	0.00	128.5	133.0	6.50	0.16	42.5	45.5	1.35	0.03	-0.14	0.0	0.00	0.00	4.70	4.67	12.40	12.37
1707	0.6	0.2	0.01	0.00	128.8	133.3	6.51	0.16	35.1	37.9	1.13	0.03	-0.13	0.0	0.00	0.00	4.69	4.66	12.39	12.36
1708	0.5	0.1	0.01	0.00	128.6	133.1	6.50	0.16	34.9	37.7	1.12	0.03	-0.14	0.0	0.00	0.00	4.70	4.68	12.37	12.34
1709	0.6	0.2	0.01	0.00	128.4	132.9	6.49	0.16	30.9	33.7	1.00	0.02	-0.16	-0.1	0.00	0.00	4.70	4.67	12.38	12.35
1710	0.5	0.1	0.01	0.00	128.5	133.0	6.50	0.16	36.0	38.9	1.16	0.03	-0.26	-0.2	-0.01	0.00	4.73	4.71	12.35	12.32
1711	0.6	0.2	0.01	0.00	128.6	133.1	6.50	0.16	25.6	28.3	0.84	0.02	-0.26	-0.2	-0.01	0.00	4.82	4.79	12.30	12.27
1712	0.5	0.1	0.01	0.00	129.4	133.9	6.54	0.16	26.9	29.6	0.88	0.02	-0.24	-0.1	-0.01	0.00	4.80	4.78	12.30	12.27
1713	0.5	0.1	0.01	0.00	128.7	133.2	6.51	0.16	26.6	29.3	0.87	0.02	-0.26	-0.2	-0.01	0.00	4.75	4.73	12.32	12.29
1714	0.6	0.2	0.01	0.00	128.8	133.3	6.51	0.16	34.5	37.4	1.11	0.03	-0.26	-0.2	-0.01	0.00	4.72	4.69	12.35	12.32
1715	0.5	0.1	0.01	0.00	127.9	132.3	6.47	0.16	35.4	38.3	1.14	0.03	-0.28	-0.2	-0.01	0.00	4.71	4.69	12.35	12.32
1716	0.5	0.1	0.01	0.00	127.7	132.1	6.46	0.16	30.8	33.5	1.00	0.02	-0.27	-0.2	-0.01	0.00	4.66	4.64	12.39	12.36
1717	0.5	0.1	0.01	0.00	128.2	132.7	6.48	0.16	31.4	34.2	1.02	0.03	-0.26	-0.2	-0.01	0.00	4.59	4.56	12.43	12.40
1718	0.5	0.1	0.01	0.00	128.2	132.7	6.48	0.16	32.1	34.9	1.04	0.03	-0.26	-0.2	-0.01	0.00	4.61	4.59	12.42	12.39
1719	0.5	0.1	0.01	0.00	127.8	132.2	6.46	0.16	37.2	40.2	1.20	0.03	-0.28	-0.2	-0.01	0.00	4.58	4.56	12.45	12.43
1720	0.5	0.1	0.01	0.00	127.9	132.3	6.47	0.16	33.7	36.6	1.09	0.03	-0.28	-0.2	-0.01	0.00	4.57	4.55	12.45	12.43
1721	0.5	0.1	0.01	0.00	127.8	132.2	6.46	0.16	41.7	44.8	1.33	0.03	-0.28	-0.2	-0.01	0.00	4.60	4.58	12.42	12.39
1722	0.5	0.1	0.00	0.00	127.8	132.2	6.46	0.16	47.4	50.5	1.50	0.04	-0.26	-0.2	-0.01	0.00	4.58	4.56	12.42	12.39
1723	0.5	0.1	0.01	0.00	127.6	132.0	6.45	0.16	46.6	49.7	1.48	0.04	-0.24	-0.1	-0.01	0.00	4.59	4.57	12.40	12.37
1724	0.5	0.1	0.01	0.00	127.3	131.7	6.44	0.16	33.3	36.1	1.08	0.03	-0.23	-0.1	-0.01	0.00	4.58	4.56	12.42	12.39
1725	0.6	0.2	0.01	0.00	128.3	132.8	6.49	0.16	45.5	48.6	1.45	0.04	-0.16	-0.1	0.00	0.00	4.48	4.46	12.49	12.47
1726	0.5	0.1	0.01	0.00	129.1	133.6	6.53	0.16	34.8	37.7	1.12	0.03	-0.14	0.0	0.00	0.00	4.54	4.52	12.46	12.44
1727	0.6	0.2	0.01	0.00	128.8	133.3	6.51	0.16	38.7	41.7	1.24	0.03	-0.15	-0.1	0.00	0.00	4.52	4.50	12.48	12.46
1728	0.6	0.2	0.01	0.00	128.8	133.3	6.51	0.16	45.9	49.0	1.46	0.04	-0.16	-0.1	0.00	0.00	4.49	4.46	12.49	12.47
1729	0.5	0.1	0.00	0.00	128.5	133.0	6.50	0.16	41.8	44.8	1.33	0.03	-0.16	-0.1	0.00	0.00	4.48	4.46	12.51	12.49
1730	0.5	0.1	0.01	0.00	128.6	133.1	6.50	0.16	45.8	48.9	1.46	0.04	-0.15	-0.1	0.00	0.00	4.50	4.47	12.48	12.46
1731	0.5	0.1	0.01	0.00	128.6	133.1	6.50	0.16	47.8	51.0	1.52	0.04	-0.15	-0.1	0.00	0.00	4.49	4.47	12.49	12.47
1732	0.5	0.1	0.01	0.00	128.8	133.3	6.51	0.16	45.6	48.7	1.45	0.04	-0.18	-0.1	0.00	0.00	4.45	4.43	12.51	12.49
1733	0.6	0.2	0.01	0.00	129.1	133.6	6.53	0.16	42.1	45.1	1.34	0.03	-0.16	-0.1	0.00	0.00	4.47	4.44	12.51	12.49
1734	0.5	0.1	0.01	0.00	129.4	133.9	6.54	0.16	44.3	47.4	1.41	0.03	-0.13	0.0	0.00	0.00	4.52	4.50	12.46	12.44
1735	0.5	0.1	0.01	0.00	128.5	133.0	6.50	0.16	37.3	40.2	1.20	0.03	-0.18	-0.1	0.00	0.00	4.51	4.49	12.47	12.45
1739	0.5	0.1	0.01	0.00	127.7	132.1	6.46	0.16	43.8	46.9	1.39	0.03	-0.18	-0.1	0.00	0.00	4.63	4.61	12.36	12.33
1740	0.5	0.1	0.01	0.00	127.7	132.1	6.46	0.16	35.1	38.0	1.13	0.03	-0.16	-0.1	0.00	0.00	4.63	4.61	12.36	12.33
1741	0.5	0.1	0.01	0.00	127.9	132.3	6.47	0.16	40.6	43.6	1.30	0.03	-0.15	-0.1	0.00	0.00	4.63	4.60	12.36	12.33
1742	0.5	0.1	0.00	0.00	128.0	132.4	6.47	0.16	30.8	33.6	1.00	0.02	-0.16	-0.1	0.00	0.00	4.64	4.62	12.35	12.32
1743	0.5	0.1	0.01	0.00	128.2	132.7	6.48	0.16	40.4	43.4	1.29	0.03	-0.14	0.0	0.00	0.00	4.64	4.62	12.34	12.31
1744	0.4	0.0	0.00	0.00	128.0	132.4	6.47	0.16	32.0	34.8	1.03	0.03	-0.15	-0.1	0.00	0.00	4.64	4.62	12.35	12.32
1745	0.5	0.1	0.01	0.00	128.1	132.5	6.48	0.16	26.2	28.8	0.86	0.02	-0.15	-0.1	0.00	0.00	4.62	4.59	12.37	12.34
1746	0.5	0.1	0.01	0.00	128.1	132.5	6.48	0.16	35.7	38.6	1.15	0.03	-0.16	-0.1	0.00	0.00	4.60	4.58	12.38	12.35
1747	0.5	0.1	0.00	0.00	127.8	132.2	6.46	0.16	32.6	35.5	1.05	0.03	-0.16	-0.1	0.00	0.00	4.57	4.55	12.41	12.38
1748	0.5	0.1	0.01	0.00	128.0	132.4	6.47	0.16	38.5	41.5	1.23	0.03	-0.16	-0.1	0.00	0.00	4.60	4.57	12.39	12.36
1749	0.5	0.1	0.01	0.00	128.0	132.4	6.47	0.16	42.3	45.3	1.35	0.03	-0.15	-0.1	0.00	0.00	4.61	4.59	12.39	12.36
1750	0.5	0.1	0.00	0.00	127.7	132.1	6.46	0.16	43.7	46.8	1.39	0.03	-0.16	-0.1	0.00	0.00	4.61	4.59	12.37	12.34
1751	0.6	0.2	0.01	0.00	127.6	132.0	6.45	0.16	36.1	39.0	1.16	0.03	-0.16	-0.1	0.00	0.00	4.59	4.56	12.39	12.36

Run 2
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (EDT)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% - Bias Corr.)
1752	0.5	0.1	0.01	0.00	127.7	132.1	6.46	0.16	34.8	37.7	1.12	0.03	-0.16	-0.1	0.00	0.00	4.58	4.56	12.40	12.37
1753	0.5	0.1	0.01	0.00	127.8	132.2	6.46	0.16	36.9	39.8	1.18	0.03	-0.16	-0.1	0.00	0.00	4.59	4.57	12.39	12.36
1754	0.5	0.1	0.01	0.00	127.7	132.1	6.46	0.16	43.1	46.2	1.37	0.03	-0.16	-0.1	0.00	0.00	4.56	4.54	12.41	12.38
1755	0.6	0.2	0.01	0.00	127.4	131.8	6.44	0.16	49.7	53.0	1.58	0.04	-0.16	-0.1	0.00	0.00	4.55	4.52	12.43	12.40
1756	0.4	0.0	0.00	0.00	128.1	132.5	6.48	0.16	39.6	42.6	1.27	0.03	-0.17	-0.1	0.00	0.00	4.52	4.50	12.45	12.43
1757	0.6	0.2	0.01	0.00	128.1	132.5	6.48	0.16	35.5	38.3	1.14	0.03	-0.18	-0.1	0.00	0.00	4.57	4.55	12.41	12.38
1758	0.6	0.2	0.01	0.00	127.7	132.1	6.46	0.16	35.1	38.0	1.13	0.03	-0.17	-0.1	0.00	0.00	4.57	4.55	12.41	12.38
1759	0.6	0.2	0.01	0.00	127.5	131.9	6.45	0.16	40.9	43.9	1.31	0.03	-0.16	-0.1	0.00	0.00	4.54	4.52	12.44	12.42
1800	0.5	0.1	0.01	0.00	127.8	132.2	6.46	0.16	38.0	41.0	1.22	0.03	-0.16	-0.1	0.00	0.00	4.56	4.54	12.42	12.39
1801	0.5	0.1	0.01	0.00	127.9	132.3	6.47	0.16	38.0	41.0	1.22	0.03	-0.17	-0.1	0.00	0.00	4.59	4.57	12.40	12.37
1802	0.6	0.2	0.01	0.00	127.5	131.9	6.45	0.16	99.1	103.5	3.08	0.08	0.05	0.1	0.01	0.00	3.78	3.76	13.02	13.00
1803	0.7	0.3	0.02	0.00	126.8	131.2	6.41	0.16	394.5	405.9	12.08	0.30	-0.18	-0.1	0.00	0.00	4.13	4.11	12.75	12.73
1804	0.6	0.2	0.01	0.00	124.0	128.3	6.27	0.16	57.2	60.6	1.80	0.04	-0.17	-0.1	0.00	0.00	4.59	4.57	12.42	12.39
1805	0.5	0.1	0.01	0.00	126.1	130.5	6.38	0.16	41.3	44.4	1.32	0.03	-0.15	-0.1	0.00	0.00	4.65	4.63	12.36	12.33
1806	0.5	0.1	0.01	0.00	127.6	132.0	6.45	0.16	34.5	37.4	1.11	0.03	-0.16	-0.1	0.00	0.00	4.60	4.58	12.42	12.39
1807	0.5	0.1	0.01	0.00	128.9	133.4	6.52	0.16	42.2	45.2	1.35	0.03	-0.14	-0.1	0.00	0.00	4.60	4.57	12.41	12.38
1808	0.5	0.1	0.01	0.00	129.6	134.1	6.55	0.16	32.8	35.7	1.06	0.03	-0.13	0.0	0.00	0.00	4.61	4.59	12.41	12.38
Ave	0.53	0.13	0.01	0.0002	128.10	132.54	6.48	0.1606	44.58	47.69	1.42	0.0352	-0.18	-0.09	0.00	-0.0001	4.58	4.56	12.42	12.40

Run 3
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (CST)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% Bias Corr.)
1846	0.4	0.6	0.04	0.00	130.7	134.0	6.80	0.16	26.9	28.7	0.89	0.02	-0.13	0.0	0.00	0.00	4.83	4.78	12.32	12.40
1847	0.4	0.6	0.04	0.00	130.5	133.8	6.79	0.16	34.9	37.0	1.14	0.03	-0.12	0.0	0.00	0.00	4.81	4.76	12.29	12.37
1848	0.5	0.6	0.04	0.00	130.8	134.1	6.81	0.16	36.6	38.7	1.20	0.03	-0.15	0.0	0.00	0.00	4.83	4.78	12.22	12.30
1849	0.4	0.6	0.04	0.00	130.6	133.9	6.80	0.16	34.0	36.0	1.11	0.03	-0.23	-0.1	-0.01	0.00	4.83	4.78	12.20	12.28
1850	0.4	0.6	0.04	0.00	130.8	134.1	6.81	0.16	32.6	34.6	1.07	0.03	-0.25	-0.1	-0.01	0.00	4.82	4.77	12.21	12.29
1851	0.4	0.6	0.04	0.00	130.5	133.8	6.79	0.16	38.2	40.3	1.25	0.03	-0.24	-0.1	-0.01	0.00	4.82	4.78	12.20	12.28
1852	0.4	0.6	0.04	0.00	130.9	134.2	6.81	0.16	30.1	32.0	0.99	0.02	-0.23	-0.1	-0.01	0.00	4.84	4.80	12.12	12.20
1853	0.3	0.5	0.03	0.00	130.8	134.1	6.81	0.16	35.5	37.5	1.16	0.03	-0.21	-0.1	-0.01	0.00	4.83	4.79	12.11	12.19
1854	0.3	0.5	0.03	0.00	130.6	133.9	6.80	0.16	29.2	31.1	0.96	0.02	-0.19	-0.1	0.00	0.00	4.84	4.79	12.09	12.17
1855	0.4	0.6	0.04	0.00	130.7	134.0	6.80	0.16	29.0	30.9	0.95	0.02	-0.23	-0.1	-0.01	0.00	4.85	4.81	12.08	12.16
1856	0.3	0.5	0.03	0.00	130.5	133.8	6.79	0.16	34.7	36.8	1.14	0.03	-0.23	-0.1	-0.01	0.00	4.87	4.82	12.09	12.17
1857	0.3	0.5	0.03	0.00	130.1	133.4	6.77	0.16	32.3	34.3	1.06	0.03	-0.22	-0.1	-0.01	0.00	4.85	4.80	12.08	12.16
1858	0.4	0.6	0.04	0.00	130.6	133.9	6.80	0.16	25.4	27.2	0.84	0.02	-0.21	-0.1	-0.01	0.00	4.84	4.79	12.11	12.19
1859	0.3	0.5	0.03	0.00	130.5	133.8	6.79	0.16	32.5	34.5	1.07	0.03	-0.22	-0.1	-0.01	0.00	4.90	4.85	12.06	12.14
1900	0.3	0.4	0.03	0.00	129.9	133.2	6.76	0.16	32.5	34.4	1.06	0.03	-0.12	0.0	0.00	0.00	4.86	4.81	12.08	12.16
1901	0.2	0.4	0.03	0.00	129.9	133.2	6.76	0.16	34.3	36.3	1.12	0.03	-0.12	0.0	0.00	0.00	4.84	4.79	12.09	12.17
1902	0.2	0.4	0.03	0.00	130.7	134.0	6.80	0.16	29.3	31.2	0.96	0.02	-0.10	0.0	0.00	0.00	4.84	4.79	12.10	12.18
1903	0.2	0.3	0.02	0.00	130.6	133.9	6.80	0.16	33.0	35.0	1.08	0.03	-0.10	0.0	0.00	0.00	4.82	4.77	12.11	12.19
1904	0.2	0.4	0.02	0.00	130.7	134.0	6.80	0.16	37.1	39.2	1.21	0.03	-0.13	0.0	0.00	0.00	4.86	4.82	12.09	12.17
1905	0.2	0.4	0.03	0.00	130.7	134.0	6.80	0.16	32.0	34.0	1.05	0.02	-0.11	0.0	0.00	0.00	4.85	4.80	12.09	12.17
1906	0.2	0.3	0.02	0.00	130.6	133.9	6.80	0.16	36.6	38.7	1.20	0.03	-0.11	0.0	0.00	0.00	4.87	4.82	12.10	12.18
1907	0.2	0.3	0.02	0.00	130.0	133.3	6.77	0.16	27.3	29.2	0.90	0.02	-0.13	0.0	0.00	0.00	4.90	4.85	12.09	12.17
1908	0.2	0.3	0.02	0.00	130.1	133.4	6.77	0.16	30.6	32.5	1.01	0.02	-0.13	0.0	0.00	0.00	4.88	4.83	12.07	12.15
1909	0.2	0.4	0.03	0.00	129.6	132.9	6.74	0.16	29.4	31.3	0.97	0.02	-0.13	0.0	0.00	0.00	4.86	4.82	12.10	12.18
1910	0.1	0.3	0.02	0.00	130.2	133.5	6.78	0.16	34.5	36.5	1.13	0.03	-0.12	0.0	0.00	0.00	4.86	4.82	12.14	12.22
1911	0.2	0.3	0.02	0.00	130.2	133.5	6.78	0.16	32.6	34.6	1.07	0.03	-0.14	0.0	0.00	0.00	4.84	4.79	12.13	12.21
1912	0.1	0.3	0.02	0.00	130.2	133.5	6.78	0.16	29.2	31.1	0.96	0.02	-0.12	0.0	0.00	0.00	4.86	4.81	12.16	12.24
1913	0.2	0.3	0.02	0.00	130.1	133.4	6.77	0.16	39.5	41.6	1.29	0.03	-0.13	0.0	0.00	0.00	4.91	4.87	12.15	12.23
1914	0.1	0.2	0.01	0.00	129.8	133.1	6.75	0.16	29.7	31.6	0.98	0.02	-0.12	0.0	0.00	0.00	4.93	4.88	12.16	12.24
1915	0.0	0.2	0.01	0.00	129.7	133.0	6.73	0.16	32.5	34.4	1.06	0.03	-0.11	0.0	0.00	0.00	4.90	4.85	12.18	12.26
1916	0.1	0.3	0.02	0.00	130.1	133.4	6.77	0.16	24.1	25.9	0.80	0.02	-0.10	0.0	0.00	0.00	4.91	4.87	12.23	12.31
1917	0.1	0.3	0.02	0.00	130.2	133.5	6.78	0.16	27.0	28.8	0.89	0.02	-0.10	0.0	0.00	0.00	4.92	4.87	12.23	12.31
1922	0.1	0.2	0.01	0.00	126.8	130.0	6.60	0.16	37.5	39.6	1.22	0.03	-0.15	0.0	0.00	0.00	4.88	4.83	12.19	12.27
1923	0.0	0.2	0.01	0.00	130.0	133.3	6.77	0.16	38.9	41.1	1.27	0.03	-0.13	0.0	0.00	0.00	4.85	4.80	12.21	12.29
1924	0.1	0.2	0.01	0.00	130.4	133.7	6.79	0.16	31.3	33.3	1.03	0.02	-0.14	0.0	0.00	0.00	4.91	4.86	12.17	12.25
1925	0.0	0.2	0.01	0.00	130.1	133.4	6.77	0.16	23.9	25.6	0.79	0.02	-0.15	0.0	0.00	0.00	4.90	4.85	12.16	12.24
1926	0.0	0.2	0.01	0.00	130.5	133.8	6.79	0.16	27.8	29.7	0.92	0.02	-0.15	0.0	0.00	0.00	4.89	4.84	12.14	12.22
1927	0.0	0.2	0.01	0.00	130.3	133.6	6.78	0.16	29.0	30.9	0.95	0.02	-0.19	-0.1	0.00	0.00	4.88	4.83	12.12	12.20
1928	0.0	0.2	0.01	0.00	130.0	133.3	6.77	0.16	36.3	38.3	1.18	0.03	-0.17	-0.1	0.00	0.00	4.88	4.83	12.10	12.18
1929	0.1	0.2	0.02	0.00	129.8	133.1	6.75	0.16	30.7	32.6	1.01	0.02	-0.16	0.0	0.00	0.00	4.87	4.82	12.06	12.14
1930	-0.1	0.1	0.01	0.00	130.1	133.4	6.77	0.16	39.3	41.4	1.28	0.03	-0.23	-0.1	-0.01	0.00	4.87	4.83	12.05	12.13
1931	0.0	0.1	0.01	0.00	129.8	133.1	6.75	0.16	39.7	41.9	1.29	0.03	-0.25	-0.1	-0.01	0.00	4.94	4.89	12.02	12.10
1932	0.1	0.2	0.01	0.00	130.0	133.3	6.77	0.16	27.7	29.5	0.91	0.02	-0.24	-0.1	-0.01	0.00	4.86	4.82	12.04	12.12
1933	0.0	0.2	0.01	0.00	129.5	132.8	6.74	0.16	32.2	34.2	1.06	0.02	-0.25	-0.1	-0.01	0.00	4.84	4.79	12.05	12.13
1934	0.0	0.2	0.01	0.00	129.6	132.9	6.74	0.16	36.8	38.9	1.20	0.03	-0.25	-0.1	-0.01	0.00	4.85	4.81	12.03	12.11

Run 3
CONTINUOUS EMISSION MEASUREMENT RESULTS
No. 2 Boiler - Waste Cooking Oil
February 20, 2001

Time (CST)	SO_2 (ppm)	SO_2 (ppm - Bias Corr.)	SO_2 (lb/hr)	SO_2 (lb/MMBTU)	NOx (ppm)	NOx (ppm - Bias Corr.)	NOx (lb/hr)	NOx (lb/MMBTU)	CO (ppm)	CO (ppm - Bias Corr.)	CO (lb/hr)	CO (lb/MMBTU)	THC (ppm)	THC (ppm-Bias Corr.)	THC (lb/hr)	THC (lb/MMBTU)	O_2 (%)	O_2 (% - Bias Corr.)	CO_2 (%)	CO_2 (% Bias Corr.)
1935	0.0	0.2	0.01	0.00	130.1	133.4	6.77	0.16	32.3	34.2	1.06	0.03	-0.24	-0.1	-0.01	0.00	4.87	4.82	12.02	12.10
1936	0.0	0.1	0.01	0.00	129.8	133.1	6.75	0.16	35.2	37.3	1.15	0.03	-0.24	-0.1	-0.01	0.00	4.85	4.81	12.04	12.12
1937	-0.1	0.1	0.00	0.00	130.3	133.6	6.78	0.16	31.2	33.1	1.02	0.02	-0.24	-0.1	-0.01	0.00	4.80	4.75	12.07	12.15
1938	-0.1	0.0	0.00	0.00	130.1	133.4	6.77	0.16	34.8	36.9	1.14	0.03	-0.26	-0.1	-0.01	0.00	4.80	4.75	12.06	12.14
1939	0.0	0.1	0.01	0.00	130.2	133.5	6.78	0.16	33.8	35.8	1.11	0.03	-0.26	-0.1	-0.01	0.00	4.81	4.76	12.07	12.15
1940	0.0	0.1	0.01	0.00	130.0	133.3	6.77	0.16	51.4	53.8	1.66	0.04	-0.25	-0.1	-0.01	0.00	4.78	4.73	12.07	12.15
1941	-0.1	0.0	0.00	0.00	130.0	133.3	6.77	0.16	35.4	37.5	1.16	0.03	-0.17	-0.1	0.00	0.00	4.80	4.75	12.06	12.14
1942	-0.1	0.1	0.01	0.00	130.2	133.5	6.78	0.16	30.0	31.9	0.99	0.02	-0.15	0.0	0.00	0.00	4.79	4.75	12.05	12.13
1943	-0.1	0.0	0.00	0.00	130.4	133.7	6.79	0.16	34.4	36.5	1.13	0.03	-0.14	0.0	0.00	0.00	4.78	4.73	12.06	12.14
1944	-0.1	0.0	0.00	0.00	129.9	133.2	6.76	0.16	42.1	44.3	1.37	0.03	-0.14	0.0	0.00	0.00	4.76	4.71	12.07	12.15
1945	-0.2	0.0	0.00	0.00	130.5	133.8	6.79	0.16	33.1	35.1	1.08	0.03	-0.14	0.0	0.00	0.00	4.79	4.74	12.06	12.14
1946	-0.2	-0.1	0.00	0.00	130.1	133.4	6.77	0.16	28.4	30.2	0.93	0.02	-0.14	0.0	0.00	0.00	4.83	4.78	12.04	12.12
1947	-0.1	0.0	0.00	0.00	130.5	133.8	6.79	0.16	36.6	38.7	1.20	0.03	-0.13	0.0	0.00	0.00	4.79	4.74	12.05	12.13
1948	-0.2	0.0	0.00	0.00	130.5	133.8	6.79	0.16	37.6	39.7	1.23	0.03	-0.11	0.0	0.00	0.00	4.79	4.74	12.06	12.14
1949	-0.2	0.0	0.00	0.00	130.1	133.4	6.77	0.16	36.3	38.4	1.19	0.03	-0.13	0.0	0.00	0.00	4.76	4.72	12.07	12.15
1950	-0.2	0.0	0.00	0.00	130.4	133.7	6.79	0.16	35.2	37.2	1.15	0.03	-0.13	0.0	0.00	0.00	4.79	4.75	12.07	12.15
1951	-0.1	0.0	0.00	0.00	130.0	133.3	6.77	0.16	33.7	35.7	1.10	0.03	-0.11	0.0	0.00	0.00	4.79	4.75	12.05	12.13
1952	-0.2	0.0	0.00	0.00	130.3	133.6	6.78	0.16	43.2	45.5	1.40	0.03	-0.15	0.0	0.00	0.00	4.79	4.74	12.07	12.15
Ave	0.12	0.27	0.02	0.0005	130.19	133.47	6.78	0.1602	33.11	35.10	1.08	0.0256	-0.17	-0.05	0.00	-0.0001	4.85	4.80	12.11	12.19

SECOR
ANALYZER CALIBRATION DATA

CLIENT: Griffin Ind.
LOCATION: Union City, TN
SOURCE I.D.: No. 2 Boiler
OPERATOR: [illegible]

DATE: 2/20/01
INITIAL CAL TIME: ~~0907~~
FINAL CAL TIME: 20:25

Grease

NOx Method 7E

INITIAL SYSTEM CALIBRATION — Span Value: 100

14:26

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air	Ø	-0.34	0.34	0.3	2
MID-RANGE	40 - 60%	44.5	~~43.7~~ 44.3	~~0.8~~ 0.1	~~0.8~~ 0.1	2
HIGH-RANGE	80 - 100%	90.5	~~40.7~~ 91.0	~~0.3~~ 0.5	0.2	2

FINAL SYSTEM CALIBRATION 2/21/01

159.9 ppm gas
resp = 147.9

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air		-0.14	0.14	0.0	2
MID-RANGE	40 - 60%		44.7	0.2	0.2	2
HIGH-RANGE	80 - 100%		91.8	1.3	1.3	2

CO Method 10

INITIAL SYSTEM CALIBRATION — Span Value: 500

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air	Ø	-1.0	1.0	0.2	2
MID-RANGE	40 - 60%	165.6	163.6	2.0	0.4	2
HIGH-RANGE	80 - 100%	303	303.9	0.9	0.2	2

FINAL SYSTEM CALIBRATION

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2 or Air		-2.7	2.7	0.5	2
MID-RANGE	40 - 60%		163.1	2.5	0.5	2
HIGH-RANGE	80 - 100%		302.1	0.9	0.2	2

THC Method 25A

INITIAL SYSTEM CALIBRATION — Span Value: 100

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm) P / A	Absolute Difference (ppm)	Actual Difference* (%)	Allowed Difference (%)
ZERO	Zero Air	Ø	0.03	0.03	—	5
LOW-RANGE	25 - 35%	30.0	30.4 / 29.8	0.6	2.0	5
MID-RANGE	45 - 55%	50.4	51.1	0.7	—	5
HIGH-RANGE	80 - 90%	83.6	84.7 / 84.5	0.2	0.2	5

FINAL SYSTEM CALIBRATION

	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference* (%)	Allowed Difference (%)
ZERO	Zero Air	Ø	-0.14	0.14	~~0.1~~	5
LOW-RANGE	25 - 35%	31.4	30.3			5
MID-RANGE	45 - 55%	51.3	49.7	1.6	—	5
HIGH-RANGE	80 - 90%	87.8	87.0			5

O_2 Method 3A

INITIAL SYSTEM CALIBRATION — Span Value: 25

0936

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2	Ø	0.02	0.02	0.1	2
MID-RANGE	40 - 60%	12.1	12.30	0.2	0.8	2
HIGH-RANGE	80 - 100%	20.0	20.4	0.4	1.6	2

FINAL SYSTEM CALIBRATION

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2		-0.07	0.07	0.3	2
MID-RANGE	40 - 60%		12.23	0.13	0.5	2
HIGH-RANGE	80 - 100%		20.35	0.35	1.4	2

CO_2 Method 3A

INITIAL SYSTEM CALIBRATION — Span Value: 25

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2	Ø	0.02	0.02	0.1	2
MID-RANGE	40 - 60%	12.0	11.91	0.09	0.4	2
HIGH-RANGE	80 - 100%	20.3	20.34	0.04	0.2	2

FINAL SYSTEM CALIBRATION

	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
ZERO	N_2		-0.14	0.14	0.6	2
MID-RANGE	40 - 60%		11.91	0.09	0.4	2
HIGH-RANGE	80 - 100%		20.25	0.05	0.2	2

* Per Method 25A the actual difference is calculated using the actual cylinder value.

SECOR

ANALYZER CALIBRATION DATA

CLIENT: Griffis Ind.
LOCATION: Union City, TN
SOURCE I.D.: No. 2 Boiler
OPERATOR: DJW

DATE: 2/20/09
INITIAL CAL ITIME: 0907
FINAL CAL TIME:

p. 2 of 2

SO_2 by RM 6C ~~NOx Method 7E~~ Grease

INITIAL SYSTEM CALIBRATION	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
Span Value: 100						
ZERO	N_2 or Air	0	0	0	0	2
MID-RANGE	40 - 60%	54.7	56.4	1.7	1.7	2
HIGH-RANGE	80 - 100%	92.06	92.4	0.34	0.3	2
FINAL SYSTEM CALIBRATION						
ZERO	N_2 or Air		-1.2	1.2	1.2	2
MID-RANGE	40 - 60%		54.8	0.1	0.1	2
HIGH-RANGE	80 - 100%		90.5	1.6	1.6	2

CO Method 10

INITIAL SYSTEM CALIBRATION	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)	Allowed Difference (%)
Span Value:						
ZERO	N_2 or Air					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2
FINAL SYSTEM CALIBRATION						
ZERO	N_2 or Air					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2

THC Method 25A

INITIAL SYSTEM CALIBRATION	Cal Gas Range (% of Span)	Actual Cylinder Value (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference* (%)	Allowed Difference (%)
Span Value:						
ZERO	Zero Air					5
LOW-RANGE	25 - 35%					5
MID-RANGE	45 - 55%					5
HIGH-RANGE	80 - 90%					5
FINAL SYSTEM CALIBRATION						
ZERO	Zero Air					5
LOW-RANGE	25 - 35%					5
MID-RANGE	45 - 55%					5
HIGH-RANGE	80 - 90%					5

O_2 Method 3A

INITIAL SYSTEM CALIBRATION	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
Span Value:						
ZERO	N_2					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2
FINAL SYSTEM CALIBRATION						
ZERO	N_2					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2

CO_2 Method 3A

INITIAL SYSTEM CALIBRATION	Cal Gas Range (% of Span)	Actual Cylinder Value (%)	Instrument Response (%)	Absolute Difference (%)	Actual Difference (%)	Allowed Difference (%)
Span Value:						
ZERO	N_2					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2
FINAL SYSTEM CALIBRATION						
ZERO	N_2					2
MID-RANGE	40 - 60%					2
HIGH-RANGE	80 - 100%					2

* Per Method 25A the actual difference is calculated using the actual cylinder value.

SECOR
CEMS BIAS DATA

CLIENT: Griffin Ind.
LOCATION: Union City TN
SOURCE I.D.: No 2 Boiler

DATE: 2/20/01
OPERATOR: DSW

Grease

NOx Method 7E

Span Value: 100

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	-0.34	0.07	0.4	-1.1	~~[illegible]~~ 0.8	5	1.2	3
BIAS GAS	~~43.7~~ 44.3	43.1	~~0.6~~ 1.2	42.4	1.9	5	0.7	3
Run 2								
ZERO		-1.1	0.9	-0.14	0.2	5	1.0	3
BIAS GAS		42.4	1.9	42.79	1.5	5	0.4	3
Run 3								
ZERO		-0.14	0.2	-1.1	0.8	5	1.0	3
1100 BIAS GAS		42.79	1.5	43.2	1.1	5	0.4	3

CO Method 10

Span Value: 500

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	-1.0	-1.4	0.1	-1.0	0.0	5	0.6	3
BIAS GAS	163.6	162.3	0.3	159.9	0.7	5	0.3	3
Run 2								
ZERO		-1.0	0.0	-3.0	0.4	5	0.4	3
BIAS GAS		159.9	0.7	159.6	0.8	5	0.1	3
Run 3								
ZERO		-3.0	0.4	0.68	0.3	5	0.7	3
BIAS GAS		159.6	0.8	161.4	0.4	5	0.4	3

THC Method 25A

Span Value: 100

1100
1541
1810
2004

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.05	0.02	0.0	-0.03	0.1	5	0.1	3
BIAS GAS	51.1	51.7	0.6	53.2	2.1	5	1.5	3
Run 2								
ZERO		-0.03	0.1	-0.15	0.2	5	0.1	3
BIAS GAS		53.2	2.1	50.3	0.8	5	2.9	3
Run 3								
ZERO		-0.15	0.2	-0.09	0.1	5	0.1	3
BIAS GAS		50.3	0.8	49.0	2.1	5	1.3	3

O_2 Method 3A

Span Value: 25

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.02	0.08	0.2	0.03	0.0	5	0.2	3
BIAS GAS	12.30	12.26	0.2	12.14	0.6	5	0.3	3
Run 2								
ZERO		0.03	0.0	-0.02	0.2	5	0.2	3
BIAS GAS		12.14	0.6	12.16	0.6	5	0.1	3
Run 3								
ZERO		-0.02	0.2	0.09	0.2	5	0.4	3
BIAS GAS		12.16	0.6	12.19	0.4	5	0.1	3

CO_2 Method 3A

Span Value: 25

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0.02	0.19	0.7	0.20	0.7	5	0.0	3
BIAS GAS	11.91	12.21	1.2	12.0	0.4	5	0.8	3
Run 2								
ZERO		0.20	0.7	0.15	0.5	5	0.2	3
BIAS GAS		12.0	0.4	12.06	0.6	5	0.2	3
Run 3								
ZERO		0.15	0.5	-0.02	0.2	5	0.7	3
BIAS GAS		11.86	0.6	11.78	0.3	5	1.1	3

SECOR
CEMS BIAS DATA

CLIENT: Griffin Ind. DATE: 2/20/01
LOCATION: Union City, TN OPERATOR: DSW
SOURCE I.D.: No. 2 Boiler

~~Waste Cooking~~ Oil (Grease p. 2 of 2

SO2 by RMUr ~~NOx Method 7E~~

Span Value: 100

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO	0	0.47	0.5	1.15	1.2	5	0.7	3
BIAS GAS	50.4	53.5	2.9	52.5	3.9	5	1.0	3
Run 2								
ZERO		1.15	1.2	-0.34	0.3	5	1.5	3
BIAS GAS		52.5	39	51.5	4.9	5	1.0	3
Run 3								
ZERO		-0.34	0.3	0.07	0.1	5	0.4	3
BIAS GAS		51.5	4.9	51.2	5.2	5	0.3	3

CO Method 10

Span Value: ______

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO						5		3
BIAS GAS						5		3
Run 2								
ZERO						5		3
BIAS GAS						5		3
Run 3								
ZERO						5		3
BIAS GAS						5		3

THC Method 25A

Span Value: ______

	Instrument Response (ppm)	Pre Test CEMS Response (ppm)	Pre Test Calibration Bias (%)	Post Test CEMS Response (ppm)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO						5		3
BIAS GAS						5		3
Run 2								
ZERO						5		3
BIAS GAS						5		3
Run 3								
ZERO						5		3
BIAS GAS						5		3

O_2 Method 3A

Span Value: ______

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO						5		3
BIAS GAS						5		3
Run 2								
ZERO						5		3
BIAS GAS						5		3
Run 3								
ZERO						5		3
BIAS GAS						5		3

CO_2 Method 3A

Span Value: ______

	Instrument Response (ppm)	Pre Test CEMS Response (%)	Pre Test Calibration Bias (%)	Post Test CEMS Response (%)	Post Test Calibration Bias (%)	Allowed Bias (%)	Calibration Drift (%)	Allowed Drift (%)
Run 1								
ZERO						5		3
BIAS GAS						5		3
Run 2								
ZERO						5		3
BIAS GAS						5		3
Run 3								
ZERO						5		3
BIAS GAS						5		3

#2 Diesel — Boiler #1

TEST 2	TOTAL STEAM	BLR #3 STEAM	TIME	
RUN #1	109620	39590	1530	
	179800	56690	1655	
	70,180	17,100	85	= 37,468 steam output lbs
	82 % effi		93.3%	45,693 ✱ mBTU/hr
RUN #2	198350	63090	1715	
	271420	89750	1832	
	73,070	26,660	77	= 36,164
			90%	44.102 ✱
RUN #3	292580	96790	1855	
	348980	114700	2000	
	56,400	17,910	65	35,529
			88.4%	43,328 ✱

70,180
− 17,100
53,080 / (85 ÷ 60) = 37,468 lb/hr steam ~ 45,693,000 BTU/hr

92 % eff

Grease — Boiler #2

TEST 1	TOTAL STEAM	BLR #3 STEAM	TIME	
RUN #1	113910	21810	1430	
	160300	29600	1545	
	46390	7790	75	= 30,880
	≈ 82%		76.9%	37,659 ✱
RUN #2	224000	49630	1705	
	282210	69260	1815	
	58210	19630	70	33,069
			82.3%	40,328 ✱
RUN #3	306200	75990	1845	
	355200	90310	1945	
	49,000	14320	60	34,680
			86.3%	42,293 ✱

eff %

50.2 mm BTU @ 80% eff

Grease − ~~≈ 120~~ 125,900 BTU/~~$~~ gal of fuel

No. 2 − 145,000 BTU/gal

M.E − 137,750 BTU/gal

lo + from.

eff = Measured BTU input / Theoretical BTU →

theoretical BTU = fuel usage (gal) ✱ BTU/gal

Flow meters not calibrated for Grease or M.E. ∴ BTU input determined based on steam output.

Laboratory Data

SECOR

Sample Gravimetric Data Form

Client: Griffin Industries
Location:
Sample Location:
Run Number: 1

Sample Identifiable-Probe Wash: (YES) / NO
-Filter: (YES) / NO
Probe Wash Liquid Level Marked: YES / (NO)
Filter Container Sealed: (YES) / NO

Probe Wash

Beaker I.D.: 1
Density of Rinse (d): 0.7857
Rinse Volume (Vaw): 120 ml
nk Concentration (Ca): 0.0000
Wa=Ca*Vaw*d 0.0000 mg or /1000 for grams
Date & Time: 3/16/01 0900
Date & Time: 3/19/01 1259

Date & Time: 3/14/01 1615
Date & Time: 3/15/01 0840

Beaker Final Weight	78.1627 g
Beaker Final Weight	78.1629 g
Ave. Beaker Final Weight	78.1628 g
Beaker Tare	78.1598 g
Beaker Tare	78.1602 g
Ave. Beaker Tare	78.1600 g
Less Blank Weight (Wa)	— g
Rinse Mass Gain (ma)	0.0028 g

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Filter

Filter I.D.: A-1
Date & Time: 3/15/01 0915
Date & Time: 3/15/01 1654

Date & Time: 2/9/01 0840
Date & Time: 2/12/01 0842

Gross Weight	0.3849 g
Gross Weight	0.3852 g
Ave. Gross Weight	0.3851 g
Filter Tare	0.3658 g
Filter Tare	0.3661 g
Ave. Filter Tare	0.3660 g
Less Filter Blank Mass Gain	0.0004 g
Filter Mass Gain (mf)	0.0187 g

NOTE: The two gross weighs must agree to +/- 0.5 mg.

Total Mass Gain (mn=mf+ma): 0.0215 g

Remarks:

Signature of Analyst: [signature]

Signature of Reviewer:

SECOR

Sample Gravimetric Data Form

Client: Griffin Industries
Location: ______
Sample Location: ______
Run Number: 2

Sample Identifiable-Probe Wash: (YES) / NO
-Filter: (YES) / NO
Probe Wash Liquid Level Marked: YES / (NO)
Filter Container Sealed: (YES) / NO

Probe Wash

Beaker I.D.: 2
Density of Rinse (d): 0.7857
Rinse Volume (Vaw): 130 ml
nk Concentration (Ca): 0.0000
Wa=Ca*Vaw*d 0.0000 mg or /1000 for grams
Date & Time: 3/16/01 0900
Date & Time: 3/19/01 1259

Date & Time: 3/14/01 1615
Date & Time: 3/15/01 0840

Beaker Final Weight	77.0826 g
Beaker Final Weight	77.0830 g
Ave. Beaker Final Weight	77.0828 g
Beaker Tare	77.0804 g
Beaker Tare	77.0802 g
Ave. Beaker Tare	77.0803 g
Less Blank Weight (Wa)	— g
Rinse Mass Gain (ma)	0.0025 g

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be substracted from the sample weight.

Filter

Filter I.D.: F-2
Date & Time: 3/15/01 0915
Date & Time: 3/15/01 1654

Date & Time: 2/9/01 0840
Date & Time: 2/12/01 0842

Gross Weight	0.3858 g
Gross Weight	0.3854 g
Ave. Gross Weight	0.3856 g
Filter Tare	0.3674 g
Filter Tare	0.3677 g
Ave. Filter Tare	0.3676 g
Less Filter Blank Mass Gain	0.0004 g
Filter Mass Gain (mf)	0.0176 g

NOTE: The two gross weights must agree to +/- 0.5 mg.

Total Mass Gain (mn=mf+ma): 0.0201 g

Remarks: ______

Signature of Analyst: [signature]

Signature of Reviewer: ______

SECOR

Sample Gravimetric Data Form

Client: Griffin Industries
Location:
Sample Location:
Run Number: 3

Sample Identifiable-Probe Wash: (YES) / NO
-Filter: (YES) / NO
Probe Wash Liquid Level Marked: YES / (NO)
Filter Container Sealed: (YES) / NO

Probe Wash

Beaker I.D.: 3
Density of Rinse (d): 0.7857
Rinse Volume (Vaw): 170 ml
nk Concentration (Ca): 0.0000
Wa=Ca*Vaw*d 0.0000 mg or /1000 for grams
Date & Time: 3/16/01 0900
Date & Time: 3/19/01 1259

Date & Time: 3/14/01 1615
Date & Time: 3/15/01 0840

Beaker Final Weight	76.4246 g
Beaker Final Weight	76.4250 g
Ave. Beaker Final Weight	76.4248 g
Beaker Tare	76.4232 g
Beaker Tare	76.4236 g
Ave. Beaker Tare	76.4234 g
Less Blank Weight (Wa)	— g
Rinse Mass Gain (ma)	0.0014 g

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Filter

Filter I.D.: A-3
Date & Time: 3/15/01 0915
Date & Time: 3/15/01 1654

Date & Time: 2/9/01 0840
Date & Time: 2/12/01 0842

Gross Weight	0.3787 g
Gross Weight	0.3782 g
Ave. Gross Weight	0.3785 g
Filter Tare	0.3612 g
Filter Tare	0.3611 g
Ave. Filter Tare	0.3612 g
Less Filter Blank Mass Gain	0.0004 g
Filter Mass Gain (mf)	0.0169 g

NOTE: The two gross weights must agree to +/- 0.5 mg.

Total Mass Gain (mn=mf+ma): 0.0183 g

Remarks:

Signature of Analyst: [signature]

Signature of Reviewer:

SECOR

Field Blank Gravimetric Data Form

Client: Griffin Industries
Location:
Sample Location:
Run Number: Blank

Sample Identifiable-Probe Wash: (YES) / NO
Probe Wash Liquid Level Marked: YES / (NO)

Probe Wash Blank

Beaker I.D.: 10
Density of Rinse (d): 0.7857
Blank Volume (Va): 120 ml
Date & Time: 3/16/01 0900
Date & Time: 3/18/01 1259

Date & Time: 3/14/01 1615
Date & Time: 3/15/01 0840

Beaker Final Weight	104.3684	g
Beaker Final Weight	104.3687	g
Ave. Beaker Final Weight	104.3686	g
Beaker Tare	104.3696	g
Beaker Tare	104.3693	g
Ave. Beaker Tare	104.3695	g
Probe Wash Blank Mass Gain (Mab)	-0.0009	g
Ca = Mab / (Va * d)	0.0000	g

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be substracted from the sample weight.

Net Blank Mass Gain: 0.0000 mg

Remarks:

Signature of Analyst: [signature]

Signature of Reviewer:

SECOR

Field Blank Gravimetric Data Form

Client: Griffin Industries
Location: ______
Sample Location: ______
Run Number: Blank

Sample Identifiable-Filter: (YES) / NO
Filter Container Sealed: (YES) / NO

Filter Blank

Filter I.D.: #14
Date & Time: 3/15/01 0900
Date & Time: 3/15/01 1645

Date & Time: 1/29/01 0950
Date & Time: 1/30/01 0833

Gross Weight	0.3577 g
Gross Weight	0.3577 g
Ave. Gross Weight	0.3577 g
Filter Tare	0.3573 g
Filter Tare	0.3572 g
Ave. Filter Tare	0.3573 g
Filter Blank Mass Gain	0.0004 g

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be substracted from the sample weight.

Net Blank Mass Gain: 0.0004 ~~mg~~ g

Remarks: ______

Signature of Analyst: [signature]

Signature of Reviewer: ______

Chain-of Custody Number:

SECOR Chain-of Custody Record

Field Office: [illegible]
Address: 315 [illegible]
[illegible]

☐ Additional documents are attached, and are a part of this Record.

Job Name: [illegible]
Location: [illegible] Ave
[illegible]

Project # [illegible] Task # [illegible]
Project Manager [illegible]
Laboratory [illegible]
Turnaround Time [illegible]

Sampler's Name
Sampler's Signature

Analysis Request

Sample ID	Date	Time	Matrix	HCID	TPHg/BTEX/WTPH-G 8015 (modified)/8020	TPHd/WTPH-D 8015 (modified)	TPH 418.1/WTPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCBs 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals	[illegible]		Comments/ Instructions	Number of Containers
A-1 [illegible]	[illegible]		[illegible]	Boiler	No. 2	- Grease				R-1						✓			[illegible]
A-2										R-2						✓			[illegible]
A-3										R-3						✓			[illegible]
[illegible]																✓			1
[illegible]																✓			1
[illegible]																✓			1
A-4 [illegible]	[illegible]		[illegible]	Boiler	No. 1	- No. 2	Fuel Oil				R-1					✓			1
5											R-2					✓			1
6											R-3					✓			1
[illegible]																✓			1

Special Instructions/Comments:

Relinquished by:	Received by:	Sample Receipt
Sign [illegible]	Sign [illegible]	Total no. of containers: 10
Print [illegible]	Print	Chain of custody seals:
Company SECOR	Company [illegible]	Rec'd in good condition/cold:
Time [illegible] Date [illegible]/01	Time Date	Conforms to record:

Relinquished by:	Received by:	
Sign	Sign	Client:
Print	Print	Client Contact:
Company	Company	Client Phone:
Time Date	Time Date	

SECOR CUSTREC Rev. 2/99

Date: [illegible]/01

Chain-of Custody Number:

SECOR Chain-of Custody Record

☐ Additional documents are attached, and are a part of this Record:

Field Office: [illegible]
Address: [illegible]

Job Name: [illegible]
Location: [illegible] Ave.
[illegible], TN

Project # [illegible] Task # [illegible]
Project Manager [illegible]
Laboratory [illegible]
Turnaround Time [illegible]

Sampler's Name
Sampler's Signature

Analysis Request

Sample ID	Date	Time	Matrix	HCID	TPHg/BTEX/WTPH-G 8015 (modified)/8020	TPHd/WTPH-D 8015 (modified)	TPH 418.1/WTPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCBs 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals	Raw F[illegible]		Comments/ Instructions	Number of Containers
[illegible] Probe wash	[illegible]		[illegible]													✓			1
[illegible] ↓	↓		↓													✓			1
QZ-1	[illegible]		Filter	Boiler No. 2 - Methyl Ester									R-1			✓			1
H-12													R-2			✓			1
H-13 ↓			↓										R-3			✓			1
QZ-1 Probe wash			Acetone													✓			1
H-12																✓			1
[illegible] ↓	↓		↓													✓			1
[illegible] Filter Blank	[illegible]		Filter	Blank (Filter)												✓			1
[illegible] P.W. Blank	[illegible]		Acetone	↓												✓			1

Special Instructions/Comments:

Relinquished by:
Sign [signature]
Print David S[illegible]
Company SECOR
Time 10:00 Date 2/2?/01

Received by:
Sign
Print
Company Shipped Fed Ex
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt
Total no. of containers: 10
Chain of custody seals:
Rec'd in good condition/cold:
Conforms to record:

Client:
Client Contact:
Client Phone:

Date: 2 / 23 / 01 Page 2 of 2

Calibration Data

SECOR

THERMOCOUPLE CALIBRATION FORM

Thermocouple ID Impinger Outlet I4
Date 2/14/00
Barometric Pressure (in Hg) 24.8
Calibrator DB

Standard ID VWR #1
Ambient Temp.(°F) 65.5

Temperature Reference Point	Source	Reference Temperature (R)	Thermocouple Potentiometer Temperature (R)	Temperature Difference (%)
0°C (32°F)	Ice Water	494.0	492.4	0.00
		493.2	492.7	0.00
		493.0	495.6	0.01
100°C (212°F)	Boiling Water	623.1	617.1	0.0
		600.0	606.7	0.02
		601.3	600.9	0.00

R= °F+460
Temperature Difference (%) <= 1.5%
Temperature Difference (%) = (Reference Temp.-Thermocouple temp.)/Reference temp

ALTERNATIVE METHOD 2
THERMOCOUPLE CALIBRATION PROCEDURE

INTRODUCTION

In EPA Method 2, EPA recommended the use of an extrapolation technique for a simplified, post-test, thermocouple calibration procedure using a two point calibration: (1) ice bath and (2) boiling water. Because of the inherent accuracy and precision of the thermocouple within ±1.3°F in the range of -32°F to 2500°F, the two-point post-test calibration procedure may be replaced with a single-point check.

A single-point calibration procedure that checks the operation of a thermocouple system within ±1.0 percent of the absolute measured temperature is all that is necessary to check the system for the presence of disconnected wire junctions, other loose connections, or a potential miscalibrated emf readout. A system that performs accurately at one temperature is expected to behave similarly at other temperatures.

Therefore, an alternative to the Method 2, two-point, thermocouple calibration can be used and the procedure is as follows:

ALTERNATIVE POST-TEST AND RECOMMENDED PRETEST CALIBRATION PROCEDURE

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacture, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall agree to within ±2°F.

A crimp in the connecting wires or crossed lines that change the location of the reference junction will affect readings. Check the continuity of the thermocouple by subjecting it to a change in the temperature (e.g.., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections (noted by a wrong change in the temperature).

To ensure linearity of the measurements, it is recommended that the emf meter be originally calibrated against a NIST traceable or a comparable voltage source at several points covering the range of intended use, e.g., 0, 500, 1000, and 2000°F.

REFERENCE

1. Shigehara, R.T., E.W. Stewart, Kenneth Alexander, "Simplified Thermocouple Calibration Procedure", Entropy, Incorporated, contained in the EMTIC TSAR Library.

DRY GAS METER POST-TEST CALIBRATION CHECK

Client: Griffin Industries
SECOR Project No.: 017.96270.300
Source: Boiler No. 2
Date: 2/20/2001

Meter Box I.D.: 3
Full Range Cal. Date:
Calibrated Y: 0.994
$\Delta H_@$: 1.902

Run 1 ΔH	Run 1 SQRT ΔH	Run 2 ΔH	Run 2 SQRT ΔH	Run 3 ΔH	Run 3 SQRT ΔH	Run 4 ΔH	Run 4 SQRT ΔH
1.21	1.10	1.61	1.27	1.37	1.17		
1.37	1.17	1.73	1.32	1.57	1.25		
1.49	1.22	1.81	1.35	1.85	1.36		
1.53	1.24	1.85	1.36	1.93	1.39		
1.57	1.25	1.85	1.36	2.06	1.43		
1.57	1.25	1.85	1.36	2.10	1.45		
1.65	1.28	1.93	1.39	2.18	1.48		
1.69	1.30	1.93	1.39	2.18	1.48		
1.13	1.06	1.65	1.28	1.89	1.38		
1.49	1.22	1.65	1.28	2.02	1.42		
1.61	1.27	1.81	1.35	2.06	1.43		
1.65	1.28	1.81	1.35	2.06	1.43		
1.61	1.27	1.89	1.37	2.06	1.43		
1.61	1.27	1.85	1.36	2.02	1.42		
1.61	1.27	1.93	1.39	2.06	1.43		
1.61	1.27	1.93	1.39	2.14	1.46		

	Run 1	Run 2	Run 3	Run 4
$[SQRT\Delta H]_{avg}$ =	1.23	1.35	1.40	
$[\Delta H]_{avg}$ =	1.53	1.82	1.97	
M_d (lb/lb-mol) =	28.77	28.85	28.80	
P_b (in. Hg) =	29.85	29.85	29.85	
T_m (°R) =	548	543	541.075	
V_m (ft^3) =	42.781	45.888	47.023	
θ (min) =	64	64	64	
Y_{qa} =	1.0261	1.0387	1.0526	

Average Y_{qa}= 1.0391
% difference = 4.54 Pass

SECOR
DRY GAS METER (DGM) CALIBRATION

DGM Serial Number: 2298882
DGM ID: 3

Standard Serial Number: 593564
Standard Y_d: 1.001

Barometric Pressure: 25.19
Date: 5/18/00

Standard				Dry Gas Meter (DGM)										
Initial Volume ft^3	Final Volume ft^3	Total Volume ft^3	Temperature °F	ΔH in. H_2O	Initial Volume ft^3	Final Volume ft^3	Total Volume ft^3	Temperature Inlet (°F)	Temperature Outlet (°F)	Temperature Average (°F)	Time min.	DGM Coefficient Y_d	ΔH@ in. H_2O
646.224	650.54	4.320	71	0.5	691.517	695.886	4.369	73	71	72.0	10.0	0.9893	1.7867
650.540	654.836	4.300	73	0.5	695.886	700.218	4.332	74	72	73	10.0	0.9912	1.8136
654.836	659.115	4.283	74	0.5	700.218	704.536	4.318	75	73	74.0	10.0	0.9905	1.8314
659.783	665.183	5.405	74	1.0	705.213	710.657	5.444	77	74	75.5	9.0	0.9928	1.8571
665.183	670.620	5.442	74	1.0	710.657	716.149	5.492	79	76	77.5	9.0	0.9946	1.8257
670.620	676.066	5.451	74	1.0	716.149	721.652	5.503	80	77	78.5	9.0	0.9961	1.816
676.613	682.339	5.732	75	1.5	722.207	727.997	5.790	81	78	79.5	8.0	0.9939	1.951
682.339	688.039	5.706	75	1.5	727.997	733.766	5.769	82	78	80	8.0	0.9939	1.967
688.039	693.741	5.708	75	1.5	733.766	739.522	5.756	82	79	80.5	8.0	0.9974	1.963
694.067	699.845	5.784	75	2.0	739.857	745.680	5.823	83	79	81	7.0	0.9986	1.950
699.845	705.602	5.763	76	2.0	745.680	751.517	5.837	83	80	81.5	7.0	0.9916	1.970
705.602	711.364	5.768	75	2.0	751.517	757.350	5.833	83	80	81.5	7.0	0.9950	1.959
711.865	717.952	6.093	75	3.0	757.858	764.013	6.155	84	80	82	6.0	0.9942	1.933
717.952	724.024	6.078	75	3.0	764.013	770.147	6.134	85	81	83.0	6.0	0.9970	1.939
724.024	730.075	6.057	76	3.0	770.147	776.273	6.126	85	82	83.5	6.0	0.9939	1.958
											Average	0.9940	1.90

ALTERNATIVE METHOD 5 POST-TEST CALIBRATION

INTRODUCTION AND BACKGROUND

EPA Method 5 requires the calibration of the metering system after each field use. Because the post-test calibration requires the use of a spirometer or wet test meter, the calibration is often conducted in the laboratory. However, a field calibration procedure is highly desirable for two reasons: (1) it eliminates questions about the possibility of the damage to the metering system occurring during transport and (2) it eliminates travel costs for a retest if the metering system fails the post-test calibration.

The alternative post-test calibration procedure described below is based on the principles of the optional pretest orifice meter coefficient check in Section 4.4.1 of Method 5. Since the orifice meter coefficient check will not detect leakages between the inlet of the metering system and the dry gas meter, the alternative procedure includes two additional steps: (1) a leak check from either the inlet of the sampling train or the inlet of the metering system and (2) a leak check of that portion of the sampling train from the pump to the orifice meter.

PROCEDURE

The alternative to the post-test calibration in Section 5.3.2 of Method 5 is as follows:

After each test run, do the following:

1. Ensure that the metering system has passed the post-test leak-check. If not, conduct a leak-check of the metering system from its inlet.

2. Conduct the leak-check of that portion of the train from the pump to the orifice meter as described in Section 5.6 of Method 5.

3. Calculate Y_{qa} for each test run using the following equation:

$$Y_{qa} = \frac{\theta}{V_m} \sqrt{\frac{0.0319\, T_m}{\Delta H_@ \left(P_b + \Delta \frac{H_{avg}}{13.6}\right)} \frac{29}{M_d}} \left(\sqrt{\Delta H}\right)_{avg}$$

where:

Y_{qa} = dry gas meter calibration check value, dimensionless.
θ = total run time, min.
V_m = total sample volume measured by dry gas meter, dcf.

T_m = absolute average dry gas meter temp., °R.
P_b = barometric pressure, in. Hg.
0.0319 = $(29.92/528)(0.75)^2$ (in. Hg/°/R) cfm^2.
Δh_{avg} = average orifice meter differential, in. H_2O.
$\Delta H@$ = orifice meter calibration coefficient, in. H_2O.
M_d = dry molecular weight of stack gas, lb/lb-mole.
29 = dry molecular weight of air, lb/lb-mole.
13.6 = specific gravity of mercury.

After each test run series, do the following:

4. Average the three or more Y_{qa}'s obtained from the test run series and compare this average Y_{qa} with the dry gas meter calibration factor, Y. The average Y_{qa} must be within 5 percent of Y.

5. If the average Y_{qa} does not meet the ± 5 percent criterion, recalibrate the meter over the full range of orifice settings, as detailed in Section 5.3.1 of Method 5. Then follow the procedure in Section 5.3.3 of Method 5.

REFERENCE

1. Roger T. Shigehara, P.G. Royals, and E.W. Steward, "Alternative Method 5 Post-Test Calibration", Entropy, Inc, contained in the EMTIC TSAR Library.

SECOR RM 205 Dilution System Verification

Client: Griffin Industries
Date: 2/20/01

Protocol Dilution Gas Standard:

Constituent: C_3H_8 / Air
Cylinder ID:
Concentration: 4.420
Instrument ID: FID

Protocol Check Standard:

Constituent: C_3H_8 / Air
Cylinder ID:
Concentration: 95.5

Dilution Level 1

Time	Predicted Concentration (ppm)	Instrument Response (ppm)	Confidence Interval [a] (%)	Absolute Difference (ppm)	Actual Difference (%)
	A	B		C = A-B	D = C/A*100
09:19-09:20	83.1	84.0	0.1	0.9	1.1
9:22- 9:23	83.0	83.9	0.2	0.9	1.1
9:24- 9:25	83.0	84.3	0.2	1.3	1.6
Average	83.0	84.1	0.2	1.0	1.3

Dilution Level 2

Time	Predicted Concentration (ppm)	Instrument Response (ppm)	Confidence Interval [a] (%)	Absolute Difference (ppm)	Actual Difference (%)
	A	B		C = A-B	D = C/A*100
9:27 - 9:28	49.8	50.3	0.0	0.5	1.0
9:30 - 9:31	49.6	50.3	0.0	0.7	1.4
9:32 - 9:33	49.6	50.3	0.0	0.7	1.4
Average	49.7	50.3	0.0	0.6	1.3

Protocol Gas Standard Direct to Instrument

Time	Cylinder Concentration (ppm)	Instrument Response (ppm)	Absolute Difference (ppm)	Actual Difference (%)
	A	B	C = A-B	D = C/A*100
9:42-9:43	95.5	94.2	1.3	1.4
9:45-9:46	↓	94.6	0.9	0.9
9:47-9:48	↓	94.5	1.0	1.0
Average	↓	94.4	1.1	1.1

[a] The confidence interval is calculated using the following equaiton:

$$CI = \frac{ABS(R_{avg} - R_I)}{R_{avg}} * 100$$

where;
R_{avg} = Average of 3 injections
R_I = Individual injection response

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

500 WEAVER PARK RD.LONGMONT,CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

DEC 18 2000

CERTIFICATE OF ACCURACY: ~~Interference Free~~™ Multi-Component EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT,CO 80501

P.O. No.: 012-1284
Project No.: 08-78979-003

Customer

SECOR

C/O TIMET
8000 WEST LAKE MEAD DR.
HENDERSON NV 89015

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: AAL9657 **Certification Date:** 11/13/00 **Exp. Date:** 11/13/2002
Cylinder Pressure*:** 1822 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
SULFUR DIOXIDE *	54.7	PPM	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997. Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Protocols.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1694	11/01/02	ALM057484	96.20 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/AIA/OPE 135/66447601	11/09/00	NDIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

SULFUR DIOXIDE *

First Triad Analysis

Date: 11/06/00	Response Unit: PPM	
Z1=-0.06000	R1=95.64000	T1=54.75000
R2=95.16000	Z2=-0.09000	T2=54.82000
Z3=-0.02000	T3=54.75000	R3=95.60000
Avg. Concentration:	54.77	PPM

Second Triad Analysis

Date: 11/13/00	Response Unit: PPM	
Z1=-0.21000	R1=96.82000	T1=54.69000
R2=96.74000	Z2=-0.16000	T2=54.68000
Z3=-0.38000	T3=54.66000	R3=96.86000
Avg. Concentration:	54.68	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999992	
Constants:	A=0.172363
B=22.383972	C=0.197640
D=0.000000	E=0.000000

APPROVED BY: Devon VonFeldt

Devon VonFeldt

Airgas
Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
FAX: (323) 567-3686

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Customer:	Airgas Intermountain	P.O.	178983
Cylinder No :	CC50984	Order No.	869389-00
Cylinder Pressure:	1900	Expiration Date:	7/21/02
Certification Date	7/21/00	Laboratory:	LOS ANGELES

Reference Standard Information:

Type	Component	Cyl. Number	Concentration
GMIS	Carbon Monoxide	CC66066	205.4 PPM
NTRM 81684	Nitric Oxide	CC66829	96.9 PPM

Instrumentation:

Instrument/Model/Serial No.	Analytical Principle
Siemens/Ultramat 5E	NDIR

Analytical Methodology does not require correction for analytical interferences.

Certified Concentrations:

Component	Concentration	Accuracy	Procedure
Carbon Monoxide	32.5 PPM	+/- 1%	G1
Nitric Oxide	44.4 PPM	+/- 1%	G1
Nox	44.5 PPM		
Nitrogen	Balance		

Analytical Results:

1st Component: Carbon Monoxide

1st Analysis Date: 7/5/00

R	98.600	S	15.500	Z	0.000	Conc	32.289	PPM
S	15.500	Z	0.000	R	98.600	Conc	32.289	PPM
Z	0.000	R	98.600	S	15.500	Conc	32.289	PPM
						AVG:	32.289	PPM

2nd Analysis Date: 7/12/00

R	98.700	S	15.700	Z	0.000	Conc	32.673	PPM
S	15.700	Z	0.000	R	98.700	Conc	32.673	PPM
Z	0.000	R	98.700	S	15.700	Conc	32.673	PPM
						AVG:	32.673	PPM

2nd Component: Nitric Oxide

1st Analysis Date: 7/12/00

R	96.500	S	44.100	Z	0.000	Conc	44.283	PPM
S	44.100	Z	0.000	R	96.500	Conc	44.283	PPM
Z	0.000	R	96.500	S	44.100	Conc	44.283	PPM
						AVG:	44.283	PPM

2nd Analysis Date: 7/21/00

R	96.500	S	44.400	Z	0.000	Conc	44.584	PPM
S	44.400	Z	0.000	R	96.500	Conc	44.584	PPM
Z	0.000	R	96.500	S	44.400	Conc	44.584	PPM
						AVG:	44.584	PPM

Certification performed in accordance with "EPA Traceability Protocol (Sept 1997)" using the assay procedures listed.

Airgas
Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-685
FAX: (323) 567-3686

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Customer:	Airgas Intermountain	P.O.	178986
Cylinder No :	CC70388	Order No.	869394-00
Cylinder Pressure:	1900	Expiration Date:	7/21/02
Certification Date	7/21/00	Laboratory:	LOS ANGELES

Reference Standard Information:

Type	Component	Cyl. Number	Concentration
GMIS	Carbon Monoxide	CC66066	205.4 PPM
NTRM 81684	Nitric Oxide	CC66829	96.9 PPM

Instrumentation:

Instrument/Model/Serial No.	Analytical Principle
Siemens/Ultramat 5E	NDIR

Analytical Methodology does not require correction for analytical interferences.

Certified Concentrations:

Component	Concentration	Accuracy	Procedure
Carbon Monoxide	61.1 PPM	+/-1%	G1
Nitric Oxide	90.4 PPM	+/-1%	G1
Nox	90.5 PPM		
Nitrogen	Balance		

Analytical Results:

1st Component: Carbon Monoxide

1st Analysis Date: 7/5/00

R	98.600	S	29.200	Z	0.000	Conc	60.828 PPM
S	29.200	Z	0.000	R	98.600	Conc	60.828 PPM
Z	0.000	R	98.600	S	29.200	Conc	60.828 PPM
						AVG:	60.828 PPM

2nd Analysis Date: 7/12/00

R	98.700	S	29.500	Z	0.000	Conc	61.391 PPM
S	29.500	Z	0.000	R	98.700	Conc	61.391 PPM
Z	0.000	R	98.700	S	29.500	Conc	61.391 PPM
						AVG:	61.391 PPM

2nd Component: Nitric Oxide

1st Analysis Date: 7/12/00

R	96.500	S	89.800	Z	0.000	Conc	90.172 PPM
S	89.800	Z	0.000	R	96.500	Conc	90.172 PPM
Z	0.000	R	96.500	S	89.800	Conc	90.172 PPM
						AVG:	90.172 PPM

2nd Analysis Date: 7/21/00

R	96.500	S	90.300	Z	0.000	Conc	90.674 PPM
S	90.300	Z	0.000	R	96.500	Conc	90.674 PPM
Z	0.000	R	96.500	S	90.300	Conc	90.674 PPM
						AVG:	90.674 PPM

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed.

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

500 WEAVER PARK RD,LONGMONT,CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT,CO 80501

P.O. No.: 012-1111
Project No.: 08-58109-003

Customer

SECOR

4700 MCMURRY DRIVE
SUITE 101
FT COLLINS CO 80525

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM008688 Certification Date: 6/28/99 Exp. Date: 6/27/2002

Cylinder Pressure***: 1882 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON MONOXIDE	303	PPM	+/- 1%	Direct NIST and NMI
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2636	2/01/03	ALM066877	248.7 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400251	06/21/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

CARBON MONOXIDE

First Triad Analysis

Date:06/21/99	Response Unit:PPM	
Z1=-0.013	R1=248.61	T1=302.55
R2=248.65	Z2=0.0368	T2=302.61
Z3=0.0243	T3=303.25	R3=248.95
Avg. Concentration:	302.8	PPM

Second Triad Analysis

Date: 06/28/99	Response Unit: PPM	
Z1=0.0830	R1=248.38	T1=302.94
R2=248.91	Z2=0.1058	T2=303.08
Z3=0.0899	T3=303.10	R3=248.83
Avg. Concentration:	303.0	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999980	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: [signature]

Virginia Chandler

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

500 WEAVER PARK RD,LONGMONT,CO 80501

Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT,CO 80501

P.O. No.: 012-1201
Project No.: 08-67770-001

Customer
SECOR

4700 MCMURRY DRIVE
SUITE 101
FT COLLINS CO 80525

WWW.SCOTTGAS.COM • ORDER ON-LINE

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM065668 Certification Date: 3/14/00 Exp. Date: 3/14/2003
Cylinder Pressure***: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	12.0 %	+/- 1%	Direct NIST and NMi
OXYGEN	12.1 %	+/- 1%	Direct NIST and NMi
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1675	1/01/03	ALM008792	13.86 %	CO2/N2
NTRM 2658	10/01/02	ALM065051	9.930 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
CO2/AP[illegible]/[illegible]97012	02/23/00	NDIR
HP/GOAB44/190206	03/13/00	TCD

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis — Second Triad Analysis — Calibration Curve

CARBON DIOXIDE

First Triad Analysis		
Date: 03/14/00	Response Unit:%	
Z1=0.0000	R1=13.960	T1=11.940
R2=13.880	Z2=0.0000	T2=12.030
Z3=0.0000	T3=12.010	R3=13.880
Avg. Concentration:	11.99	%

Calibration Curve:
Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.999985
Constants: A=0.001160
B=-0.132812 C=1.683594
D=-0.528320 E=0.073853

OXYGEN

First Triad Analysis		
Date: 03/14/00	Response Unit:PCT	
Z1=0.0000	R1=9.9460	T1=12.097
R2=9.9270	Z2=-0.010	T2=12.087
Z3=0.010	T3=12.076	R3=9.9180
Avg. Concentration:	12.09	%

Calibration Curve:
Concentration=A+Bx+Cx2+Dx3+Ex4
r=1.000000
Constants: A=-5.7367E-02
B=3.5995E-08 C=1.0142E-18
D=0.000000 E=0.000000

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

500 WEAVER PARK RD,LONGMONT,CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory		Customer
SCOTT SPECIALTY GASES	P.O. No.: 012-1165	SECOR
500 WEAVER PARK RD	Project No.: 08-64154-004	C/O PHELPS DODGE MAGNET
LONGMONT,CO 80501		2131 SOUTH COLISEUM BLVD.
		FORT WAYNE IN 46803

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM003367 Certification Date: 11/15/99 Exp. Date: 11/14/2002

Cylinder Pressure***: 1967 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
CARBON DIOXIDE	20.3	%	+/- 1%	Direct NIST and NMi
OXYGEN	20.0	%	+/- 1%	Direct NIST and NMi
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1675	1/01/03	ALM008792	13.96 %	CARBON DIOXIDE
NTRM 2659	12/01/01	ALM065411	20.92 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HP/QUAD H/190206	11/15/99	TCD
HP/QUAD H/190206	11/15/99	TCD

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

CARBON DIOXIDE

First Triad Analysis			Second Triad Analysis	Calibration Curve	
Date: 11/15/99	Response Unit:PCT			Concentration=A+Bx+Cx2+Dx3+Ex4	
Z1=0.0100	R1=14.012	T1=20.292		r=1.000000	
R2=13.933	Z2=0.0100	T2=20.239		Constants:	A=6.6810E-02
Z3=0.0100	T3=20.294	R3=13.935		B=9.777E-08	C=4.3657E-18
Avg. Concentration:	20.27	%		D=0.000000	E=0.000000

OXYGEN

First Triad Analysis			Second Triad Analysis	Calibration Curve	
Date: 11/15/99	Response Unit:PCT			Concentration=A+Bx+Cx2+Dx3+Ex4	
Z1=-0.010	R1=20.921	T1=19.977		r=0.999999	
R2=20.919	Z2=-0.030	T2=19.961		Constants:	A=-9.1664E-02
Z3=-0.030	T3=19.966	R3=20.919		B=3.8472E-08	C=2.9501E-19
Avg. Concentration:	19.97	%		D=0.000000	E=0.000000

Airgas
Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
FAX: (323) 567-3686

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Customer:	Airgas Intermountain	P.O.	178966
Cylinder No :	CC19762	Order No.	869370-00
Cylinder Pressure:	2000	Expiration Date:	7/5/03
Certification Date	7/5/00	Laboratory:	LOS ANGELES

Reference Standard Information:

Type	Component	Cyl. Number	Concentration
GMIS	Propane	588441	100.04 PPM

Instrumentation:

Instrument/Model/Serial No.	Analytical Principle
Rosemount/400A	FID

Analytical Methodology does not require correction for analytical interferences.

Certified Concentrations:

Component	Concentration	Accuracy	Procedure
Propane	95.5 PPM	+/- 1%	G1
Air	Balance		

Analytical Results:

1st Component: Propane

1st Analysis Date: 7/5/00

R	99.000	S	94.500	Z	0.000	Conc	95.493 PPM
S	94.500	Z	0.000	R	99.000	Conc	95.493 PPM
Z	0.000	R	99.000	S	94.500	Conc	95.493 PPM
						AVG:	95.493 PPM

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed.

Do not use cylinder below 150 psig.

Approved for Release

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

500 WEAVER PARK RD,LONGMONT,CO 80501

Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT,CO 80501

P.O. No.: 012-1165
Project No.: 08-64154-001

Customer

SECOR

C/O PHELPS DODGE MAGNET
2131 SOUTH COLISEUM BLVD.
FORT WAYNE IN 46803

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; September 1997.

Cylinder Number: ALM056720 Certification Date: 11/16/99 Exp. Date: 11/15/2002

Cylinder Pressure***: 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	20.9	%	+/- 2%	NIST and NMi
PROPANE	4.420	PPM	+/- 2%	NIST and NMi
NITROGEN		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedures , September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2659	12/01/01	ALM065411	20.92 %	OXYGEN
NTRM 1200	8/01/01	ALM011586	1193. PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
PARAMAG O2/SERVOMEX/244/701/1446	10/18/99	PARAMAGNETIC
HPGC/5890/3115A34623	11/16/99	FID

PROTOCOL

APPROVED BY: Devon VonFeldt

Scott Specialty Gases

Shipped From: 500 WEAVER PARK RD
LONGMONT CO 80501
Phone: 888-253-1635 Fax: 303-772-7673

C E R T I F I C A T E   O F   A N A L Y S I S

SECOR C/O PHELPS DODGE
TERESA MYERS
4300 NEW HAVEN AVE.

FORT WAYNE IN 46803

PROJECT #: 08-77814-001
PO#: 012-1293
ITEM #: 0801022 AL
DATE: 1/09/01

CYLINDER #: ALM033672
FILL PRESSURE: 2000 PSIG

PURE MATERIAL: AIR CAS# 132259-10-0

GRADE: HYDROCARBONFREE

IMPURITY	MAXIMUM CONCENTRATIONS	ACTUAL CONCENTRATIONS
O2 CONTENT	=20 TO 21%	= 20 TO 21%
CO	<0.5PPM	< 0.5 PPM
CO2	<1PPM	< 1 PPM
H2O	<5PPM	< 5 PPM
THC(CH4)	<0.1PPM	< 0.1 PPM

..A 2000 PSIG

ANALYST: Wayne Johnson
WAYNE JOHNSON

Scott Specialty Gases

Shipped From: 500 WEAVER PARK RD
LONGMONT CO 80501
Phone: 888-253-1635 Fax: 303-772-7673

C E R T I F I C A T E   O F   A N A L Y S I S

SECOR C/O PHELPS DODGE
TERESA MYERS
4300 NEW HAVEN AVE.

FORT WAYNE IN 46803

PROJECT #: 08-77814-001
PO#: 012-1293
ITEM #: 0801022 AL
DATE: 1/09/01

CYLINDER #: ALM019539
FILL PRESSURE: 2000 PSIG

PURE MATERIAL: AIR CAS# 132259-10-0

GRADE: HYDROCARBONFREE

IMPURITY	MAXIMUM CONCENTRATIONS	ACTUAL CONCENTRATIONS
O_2 CONTENT	=20 TO 21%	= 20 TO 21%
CO	<0.5PPM	< 0.5 PPM
CO_2	<1PPM	< 1 PPM
H_2O	<5PPM	< 5 PPM
THC(CH_4)	<0.1PPM	< 0.1 PPM

CGA 590 2000 PSIG

ANALYST: WAYNE JOHNSON

Scott Specialty Gases

Shipped From: 500 WEAVER PARK RD
LONGMONT CO 80501
Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ANALYSIS

SECOR

C/O TC ADVERTISING
245 BENTON ROAD
EAST LONG MEADOW MA 01028

PROJECT #: 08-72602-002
PO#: 0121240
ITEM #: 08025811 YA
DATE: 7/03/00

CYLINDER #: 1A012556
FILL PRESSURE: 2000 PSIG

PRODUCT EXPIRATION: 7/03/2002

40% HYDROGEN & 60% HELIUM

COMPONENT	ANALYSIS
HYDROGEN	40%
HELIUM	BALANCE

CGA 350 2000 PSIG NON-CERTIFIED

ANALYST: [signature]