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Comprehensive Emissions Test Report

Cargill AgHorizons
Particulate and Opacity
Compliance Testing

Testing Date(s): September 10-11, 2014

Report Date: October 14, 2014

Revision Date: No revision to date

Subject Facility:

Cargill AgHorizons
201 South George Street
Decatur, MI 49045

Regulatory Permit No.:

103-13
State Registration No. M3654

Subject Emission Sources:

EUGRAINRECEIVINGS	BH1
EURAILLOADING	BH2
South Receiving Pits 1 & 2	SR1 & SR2
North Rail Load-out 1	NRL1
EUGRAINHANDLING	

Test Locations:

Baghouse Exhaust
Baghouse Exhaust
Exhaust
Exhaust

Report Prepared For:

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Pace Project No. 12-14-1124

Regulatory Summary

Subject Facility: Cargill AgHorizons
 Decatur Grain Elevator
 Plant Address: 201 South George Street
 Decatur, MI 49045

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Air Permit No.: 103-13
 Facility ID No.: State Registration No. M3654

Emission Unit IDs	Emission Unit Name	Regulated Constituent	Regulatory Citations	Regulatory Limit	Average Test Result
EUGRAIN RECEIVINGS	Grain Receiving Baghouse	Particulate	40 CFR Pt. 60.302 R 336.1331	0.01 GR/DSCF 0.01 LB/1000 LB of gas	0.00052 GR/DSCF 0.00097 LB/1000 LB of gas
		Opacity		0%	0%
EURAIL LOADING	Rail Loadout Baghouse	Particulate	40 CFR Pt. 60.302 R 336.1331	0.01 GR/DSCF 0.01 LB/1000 LB of gas	0.00036 GR/DSCF 0.00069 LB/1000 LB of gas
		Opacity		0%	0%
SR1	South Receiving Pit 1	Opacity	40CFR Pt.60.302(c)(1) 40CFR Pt.52.21(c)(d) R336.1301,,1331	≤5% as six-minute average	2.5% as high six-minute average
SR2	South Receiving Pit 2	Opacity	40CFR Pt.60.302(c)(1) 40CFR Pt.52.21(c)(d) R336.1301,,1331	≤5% as six-minute average	1.3% as high six-minute average
NRL1	North Rail Loadout	Opacity	40CFR Pt.60.302(c)(1) 40CFR Pt.52.21(c)(d) R336.1301,,1331	≤5% as six-minute average	0.6% as high six-minute average
	Grain Handling	Opacity	40CFR Pt.60.302(c)(1) 40CFR Pt.52.21(c)(d) R336.1301,,1331	0%	0%

Executive Summary

Cargill AgHorizons contracted Pace Analytical Services, Inc. to perform particulate emissions compliance testing on the Grain Receiving Baghouse and Rail Loadout Baghouse Exhausts and opacity compliance testing on the Receiving Pits 1 & 2, Rail Loadout Spout/Rail Car, and Grain Handling Equipment at the Decatur Grain Elevator facility located in Decatur, Michigan. Testing was performed on September 10 and 11, 2014. Summary results are highlighted in the following table:

Test Results Summary

<u>Parameter</u>	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>	<u>Average</u>
Grain Receiving Baghouse				
Particulate Mass Rate, LB/HR	0.130	0.037	0.067	0.078
Particulate Concentration, GR/DSCF	0.00088	0.00024	0.00043	0.00052
Particulate Mass Rate, LB/1000 LB gas	0.00166	0.00045	0.00081	0.00097
Rail Loadout Baghouse				
Particulate Mass Rate, LB/HR	0.085	0.073	0.107	0.088
Particulate Concentration, GR/DSCF	0.00035	0.00030	0.00044	0.00036
Particulate Mass Rate, LB/1000 LB gas	0.00067	0.00057	0.00082	0.00069

Introduction

Pace Analytical Services, Inc. personnel conducted particulate emissions compliance testing on the Grain Receiving Baghouse and Rail Loadout Baghouse Exhausts and opacity compliance testing on the Receiving Pits 1 & 2, Rail Loadout Spout/Rail Car, and Grain Handling Equipment at the Decatur Grain Elevator facility located in Decatur, Michigan. Jake Nelson, Brett Erickson and Dan Luoma performed on-site testing activities. Terry Borgerding provided administrative project management. Mike Borrie with Cargill AgHorizons coordinated plant activities during testing. Dale Turton and David Patterson with the Michigan Department of Environmental Quality (MDEQ) witnessed the testing activities. Pace Analytical Services, Inc. prepared a comprehensive test protocol that was submitted to MDEQ prior to testing. On-site activities consisted of the following measurements:

- Particulate, three independent samplings on the Grain Receiving and Rail Loadout baghouses.
- Volumetric airflow, measurements collected in conjunction with isokinetic testing.
- Visible emissions, one independent one-hour monitoring period on all sources.

The project objectives were to quantify particulate and opacity emission constituents and compare them to applicable air emissions regulations stipulated by MPCA and the facility permit. These measurements were performed at normal operating conditions. Quality protocols comply with regulatory compliance testing requirements.

Subsequent sections summarize the test results and provide descriptions of the process and test methods. Supporting information and raw data are in the appendices.

Results Summary

Results of particulate determinations are summarized in Table 1 and 2. The particulate emission rate from the Grain Receiving Baghouse averaged 0.00097 LB/1000 LB of Exhaust Gas at 0.00052 GR/DSCF. The particulate emission rate from the Rail Loadout Baghouse averaged 0.00069 LB/1000 LB of Exhaust Gas at 0.00036 GR/DSCF. The particulate emission limit for both of these sources is 0.01 GR/DSCF and 0.01 LB/1000 LB of Exhaust Gas. Subsequent tables provide expanded detail of the testing results. The airflow results reported in Table 13-14 were preliminary measurements used to develop testing procedure details and are not used in emissions determinations.

Results of opacity observations are summarized in Tables 7-12. During this test event most all of the opacity observational readings on each of the sources tested were 0% with a few readings of 5% and 10% from the receiving pits and Rail Loadout spout. All of the sources were below the opacity limit for the source.

Test ports were reconfigured on each of the baghouse stacks before testing to make them compliant with EPA Method 1 criteria. Drawings presented in Figure 1 and 2 are representative of the stack configuration at the time of testing.

The data in this report are indicative of emission characteristics of the measured sources for process conditions at the time of the test. Representations to other sources and test conditions are beyond the scope of this report.

Summary Tables

Cargill AgHorizons

Decatur, MI
Pace Project No. 12-14-1124

Table 1

Results Summary
EUGRAINRECEIVINGS Baghouse Exhaust
Test 1

Parameter	Run 1	Run 2	Run 3	Average
Date of Run	9/10/14	9/10/14	9/10/14	
Time of Run	1042-1118	1305-1440	1520-1655	
Grain Throughput, Bushels	36000	39000	40500	38500
Baghouse Pressure Drop, Inches H2O	0.3	0.3	0.3	0.3
Volumetric Flow Rate (Rounded to 100 CFM)				
ACFM	18,700	19,500	20,200	19,500
DSCFM	17,200	17,900	18,100	17,700
Gas Temperature, °F	71	73	77	74
Gas Moisture Content, %v/v	2.1	1.6	3.3	2.3
Gas Composition, %v/v, dry				
Carbon Dioxide, CO ₂	0.0	0.0	0.0	0.0
Oxygen, O ₂	21.0	21.0	21.0	21.0
Nitrogen, N ₂ (by difference)	79.0	79.0	79.0	79.0
Particulate Mass Rate, LB/HR				
Filterable Particulate	0.130	0.037	0.067	0.078
Particulate Concentration, GR/DSCF				
Filterable Particulate	0.00088	0.00024	0.00043	0.00052
Regulatory Units, LB/1000 LB Exhaust Gas				
Dry Catch Particulate	0.00166	0.00045	0.00081	0.00097

Cargill AgHorizons

Decatur, MI
Pace Project No. 12-14-1124

Table 2

Results Summary
EURAILLOADING Baghouse Exhaust
Test 1

Parameter	Run 1	Run 2	Run 3	Average
Date of Run	9/11/14	9/11/14	9/11/14	
Time of Run	0816-0927	1022-1133	1208-1319	
Rail Loadout Throughput, Bushels	23990.5	24003.6	23839.9	23944.7
Baghouse Pressure Drop, Inches H2O	0.35	0.35	0.35	0.35
Volumetric Flow Rate (Rounded to 100 CFM)				
ACFM	28,600	29,100	29,300	29,000
DSCFM	28,000	28,300	28,500	28,300
Gas Temperature, °F	58	60	59	59
Gas Moisture Content, %v/v	1.4	1.8	1.7	1.6
Gas Composition, %v/v, dry				
Carbon Dioxide, CO ₂	0.0	0.0	0.0	0.0
Oxygen, O ₂	21.0	21.0	21.0	21.0
Nitrogen, N ₂ (by difference)	79.0	79.0	79.0	79.0
Particulate Mass Rate, LB/HR				
Filterable Particulate	0.085	0.073	0.107	0.088
Particulate Concentration, GR/DSCF				
Filterable Particulate	0.00035	0.00030	0.00044	0.00036
Regulatory Units, LB/1000 LB Exhaust Gas				
Dry Catch Particulate	0.00067	0.00057	0.00082	0.00069