

The Andersons, Inc. - Reading Facility
2020 Compliance Source Test Report

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The Andersons, Inc. - Reading Facility contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance emissions test program on the Rail Loadout (EURAILLOADING) at the Andersons, Inc. - Reading Facility located in Reading, Michigan. The tests were conducted to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Permit No. 720-81A.

The specific objectives were to:

- Verify the filterable Particulate Matter (PM) emissions of the Baghouse serving EURAILLOADING
- Verify the Visible Emissions (VEs) from the North End Exhaust Stack, Train Loading Port, and Truck Loading Port
- Conduct the test program with a focus on safety

Montrose performed the tests to measure the emission parameters listed in Table 1-1.

**TABLE 1-1
SUMMARY OF TEST PROGRAM**

Test Date(s)	Unit ID/ Source Name	Activity/ Parameters	Test Methods	No. of Runs	Duration (Minutes)
8/13/2020	Rail Loadout	Velocity/Volumetric Flow Rate	EPA 1 & 2	3	60
8/13/2020	Rail Loadout	O ₂ , CO ₂	EPA 3	3	60
8/13/2020	Rail Loadout	Moisture	EPA 4	3	60
8/13/2020	North Exhaust Stack	Opacity	EPA 9	3	60
8/13/2020	Train Loading Port	Opacity	EPA 9	3	60
8/14/2020	Truck Loading Port	Opacity	EPA 9	3	60
8/13/2020	Rail Loadout	Filterable PM	EPA 17	3	60

To simplify this report, a list of Units and Abbreviations is included in Appendix D.1. Throughout this report, chemical nomenclature, acronyms, and reporting units are not defined. Please refer to the list for specific details.

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This report presents the test results and supporting data, descriptions of the testing procedures, descriptions of the facility and sampling locations, and a summary of the quality assurance procedures used by Montrose. The average emission test results are summarized and compared to their respective permit limits in Tables 1-2 through 1-4. Detailed results for individual test runs can be found in Section 4.0. All supporting data can be found in the appendices.

The testing was conducted by the Montrose personnel listed in Table 1-5. The tests were conducted according to the test plan (protocol) dated February 27, 2020 that was submitted to EGLE.

**TABLE 1-2
SUMMARY OF AVERAGE COMPLIANCE RESULTS -
RAIL LOADOUT
AUGUST 13, 2020**

Parameter/Units	Average Results	Emission Limits
Filterable PM gr/dscf*	<0.0003	0.01

* The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 4-2 for details.

**TABLE 1-3
SUMMARY OF AVERAGE VISIBLE EMISSIONS RESULTS -
AUGUST 13, 2020**

Parameter/Units	Average Results	Emission Limits
<u>North End Exhaust Stack</u>		
Visible Emissions % (6 minute average)*	0.0	5.0
<u>Train Loading Port</u>		
Visible Emissions % (6 minute average)*	1.9	5.0

* Maximum 6-minute Average, % Opacity.

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Test personnel and observers are summarized in Table 1-5.

**TABLE 1-5
TEST PERSONNEL AND OBSERVERS**

Name	Affiliation	Role/Responsibility
Mason Sakshaug	Montrose	Field Project Manager, QI
Ben Durham	Montrose	Field Technician
David Trahan	Montrose	Field Technician, QI
Jake Drake	The Andersons, Inc.	Observer/Client Liaison/Test Coordinator
Steve Bell	The Andersons, Inc.	Observer/Client Liaison/Test Coordinator

2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION, OPERATION, AND CONTROL EQUIPMENT

The Andersons, Inc. - Reading Facility operates a grain elevator. Grain is received via rail car and is then transferred to the grain storage silo prior to processing. The emissions from the rail car (EURAILLOADING) are controlled by a baghouse. EURAILLOADING was in operation for this testing event.

2.2 FLUE GAS SAMPLING LOCATION

Information regarding the sampling location is presented in Table 2-1.

**TABLE 2-1
 SAMPLING LOCATION**

Sampling Location	Stack Inside Dimensions (in.)	Distance from Nearest Disturbance		Number of Traverse Points
		Downstream EPA "B" (in./dia.)	Upstream EPA "A" (in./dia.)	
Rail Loadout Baghouse Exhaust Stack	27.75	67.0 / 2.4	39.0 / 1.4	Isokinetic: 24 (12/port)

The Sample location was verified in the field to conform to EPA Method 1. Acceptable cyclonic flow conditions were confirmed prior to testing using EPA Method 1, Section 11.4. See Appendices A.1 and A.2 for more information.

2.3 OPERATING CONDITIONS AND PROCESS DATA

Emission tests were performed while the source/units and air pollution control devices were operating at the conditions required by the permit. The unit was tested while operating at normal conditions.

Plant personnel were responsible for establishing the test conditions and collecting all applicable unit-operating data. The process data that was provided is presented in Appendix B. Data collected includes the following parameters:

- Total grain loaded, bushels

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 TEST METHODS

The test methods for this test program were presented previously in Table 1-1. Additional information regarding specific applications or modifications to standard procedures is presented below.

3.1.1 EPA Method 1, Sample and Velocity Traverses for Stationary Sources

EPA Method 1 is used to assure that representative measurements of volumetric flow rate are obtained by dividing the cross-section of the stack or duct into equal areas, and then locating a traverse point within each of the equal areas. Acceptable sample locations must be located at least two stack or duct equivalent diameters downstream from a flow disturbance and one-half equivalent diameter upstream from a flow disturbance.

The sample port and traverse point locations are detailed in Appendix A.

3.1.2 EPA Method 2, Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

EPA Method 2 is used to measure the gas velocity using an S-type pitot tube connected to a pressure measurement device, and to measure the gas temperature using a calibrated thermocouple connected to a thermocouple indicator. Typically, Type S (Stausscheibe) pitot tubes conforming to the geometric specifications in the test method are used, along with an inclined manometer.

3.1.3 EPA Method 3, Gas Analysis for the Determination of Dry Molecular Weight

EPA Method 3 is used to calculate the dry molecular weight of the stack gas using one of three methods. The first choice is to measure the percent O₂ and CO₂ in the gas stream. A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO₂ and percent O₂ using either an Orsat or a Fyrite analyzer.

3.1.4 EPA Method 4, Determination of Moisture Content in Stack Gas

EPA Method 4 is a manual, non-isokinetic method used to measure the moisture content of gas streams. Gas is sampled at a constant sampling rate through a probe and impinger train. Moisture is removed using a series of pre-weighed impingers containing methodology-specific liquids and silica gel immersed in an ice water bath. The impingers are weighed after each run to determine the percent moisture.

The typical sampling system is detailed in Figure 3-1.

3.1.5 EPA Method 9, Visual Determination of the Opacity of Emissions

EPA Method 9 is used to observe the visual opacity of emissions (opacity). The observer stands at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140°

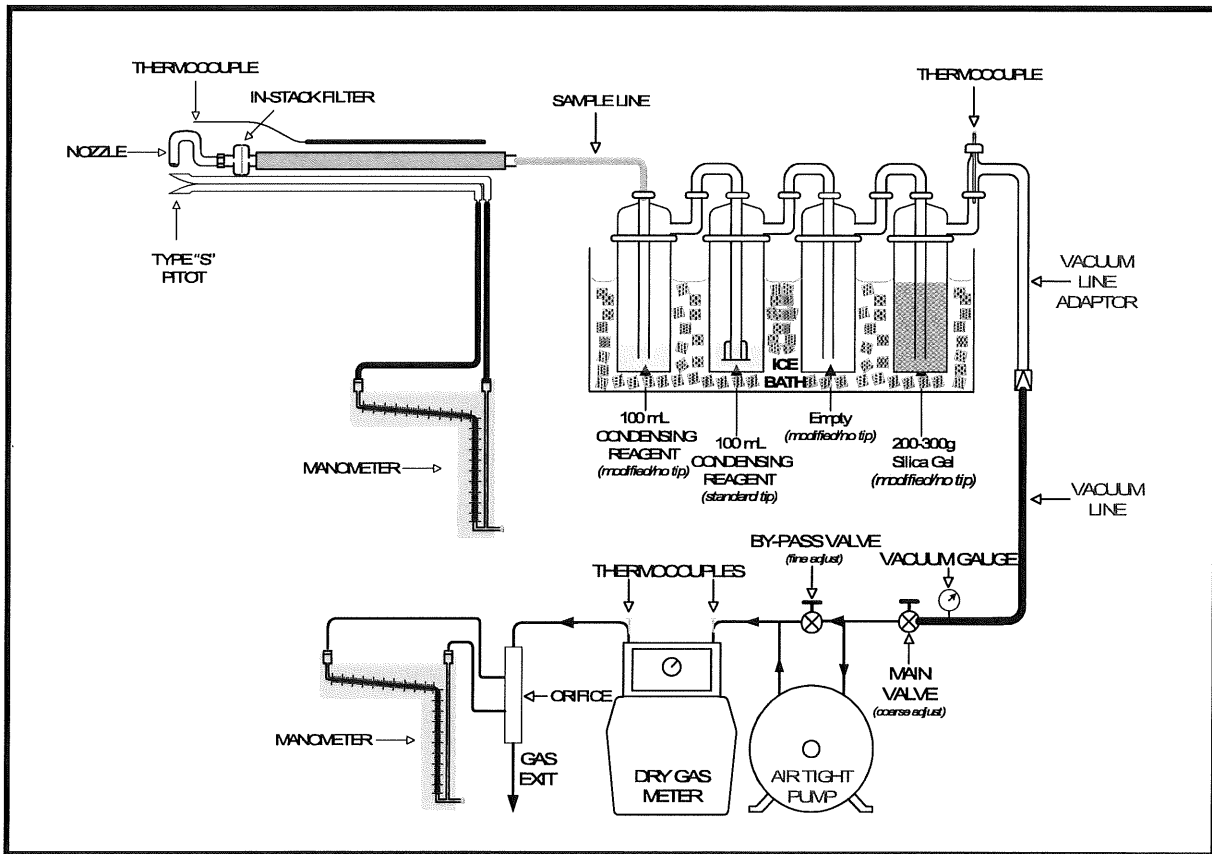
sector to their back. The line of vision is perpendicular to the plume direction and does not include more than one plume diameter. Observations are recorded at 15-second intervals and are made to the nearest 5% opacity. The qualified observer is certified according to the requirements of EPA Method 9, section 3.1.

3.1.6 EPA Method 17, Determination of Particulate Matter Emissions from Stationary Sources

EPA Method 17 is a manual, isokinetic test method used to measure emissions of FPM. Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at stack temperature. The PM mass is determined gravimetrically after the removal of uncombined water.

The typical sampling system is detailed in Figure 3-1.

**FIGURE 3-1
 US EPA METHOD 17 SAMPLING TRAIN**



3.2 PROCESS TEST METHODS

The test plan did not require that process samples be collected during this test program; therefore, no process sample data are presented in this test report.

4.0 TEST DISCUSSION AND RESULTS

4.1 FIELD TEST DEVIATIONS AND EXCEPTIONS

Run 3 of EPA Method 17 testing did not meet the permitted minimum metered volume requirement of 60.0 dscf. Based on preliminary results of Run 3, Lindsey Wells of EGLE accepted the Run as valid with a sample volume of 59.0 dscf.

4.2 PRESENTATION OF RESULTS

The average results are compared to the permit limits in Tables 1-2 through 1-4. The results of individual compliance test runs performed are presented in Tables 4-1 through 4-3. Emissions are reported in units consistent with those in the applicable regulations or requirements. Additional information is included in the appendices as presented in the Table of Contents.

Concentration values in Table 1-2 and 4-1 denoted with a '<' were measured to be below the minimum detection limit (MDL) of the applicable analytical method. Emissions denoted with a '<' in Table 1-2 and 4-1 were calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

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**TABLE 4-1
FILTERABLE PM EMISSIONS RESULTS -
RAIL LOADOUT**

Run Number	1	2	3	Average
Date	8/13/2020	8/13/2020	8/13/2020	--
Time	9:04-10:25	10:43-11:47	12:05-13:07	--
Flue Gas Parameters				
O ₂ , % volume dry	21.0	21.0	21.0	21.0
CO ₂ , % volume dry	0.0	0.0	0.0	0.0
flue gas temperature, °F	73.5	80.4	83.4	79.1
moisture content, % volume	2.3	1.5	1.9	1.9
volumetric flow rate, dscfm	13,902	13,819	13,402	13,708
Filterable PM gr/dscf*	<0.0003	<0.0003	<0.0003	<0.0003

* The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 4.2 for details.

**TABLE 4-2
VISIBLE EMISSIONS RESULTS -
AUGUST 13, 2020**

Run Number	1	2	3	Average
Date	8/13/2020	8/13/2020	8/13/2020	--
Time	9:04-10:22	10:43-11:47	12:05-13:05	--
<u>North End Exhaust Stack</u>				
Visible Emissions % (6 minute average)*	0.0	0.0	0.0	0.0
<u>Train Loading Port</u>				
Visible Emissions % (6 minute average)*	4.8	0.4	0.4	1.9

* Maximum 6-minute Average, % Opacity.

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**TABLE 4-3
 VISIBLE EMISSIONS RESULTS -
 AUGUST 14, 2020**

Run Number	1	2	3	Average
Date	8/14/2020	8/14/2020	8/14/2020	--
Time	8:11-9:11	9:12-11:49	11:50-13:55	--
<u>Truck Loading Port</u>				
Visible Emissions % (6 minute average)*	2.29	2.29	5.21	3.26

* Maximum 6-minute Average, % Opacity.

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA/QC AUDITS

The meter box and sampling trains used during sampling performed within the requirements of their respective methods. All post-test leak checks, minimum metered volumes, minimum sample durations, and percent isokinetics met the applicable QA/QC criteria with the exception of Run 3 which collected 59.0 dscf instead of the required 60.0 dscf.

Fyrite analyzer audits were performed during this test in accordance with EPA Method 3, Section 10.1 requirements. The results were within $\pm 0.5\%$ of the respective audit gas concentrations.

5.2 QA/QC DISCUSSION

Run 3 of EPA Method 17 testing did not meet the permitted minimum metered volume requirement of 60.0 dscf. Lindsey Wells of EGLE accepted the Run as valid with a sample volume of 59.0 dscf.

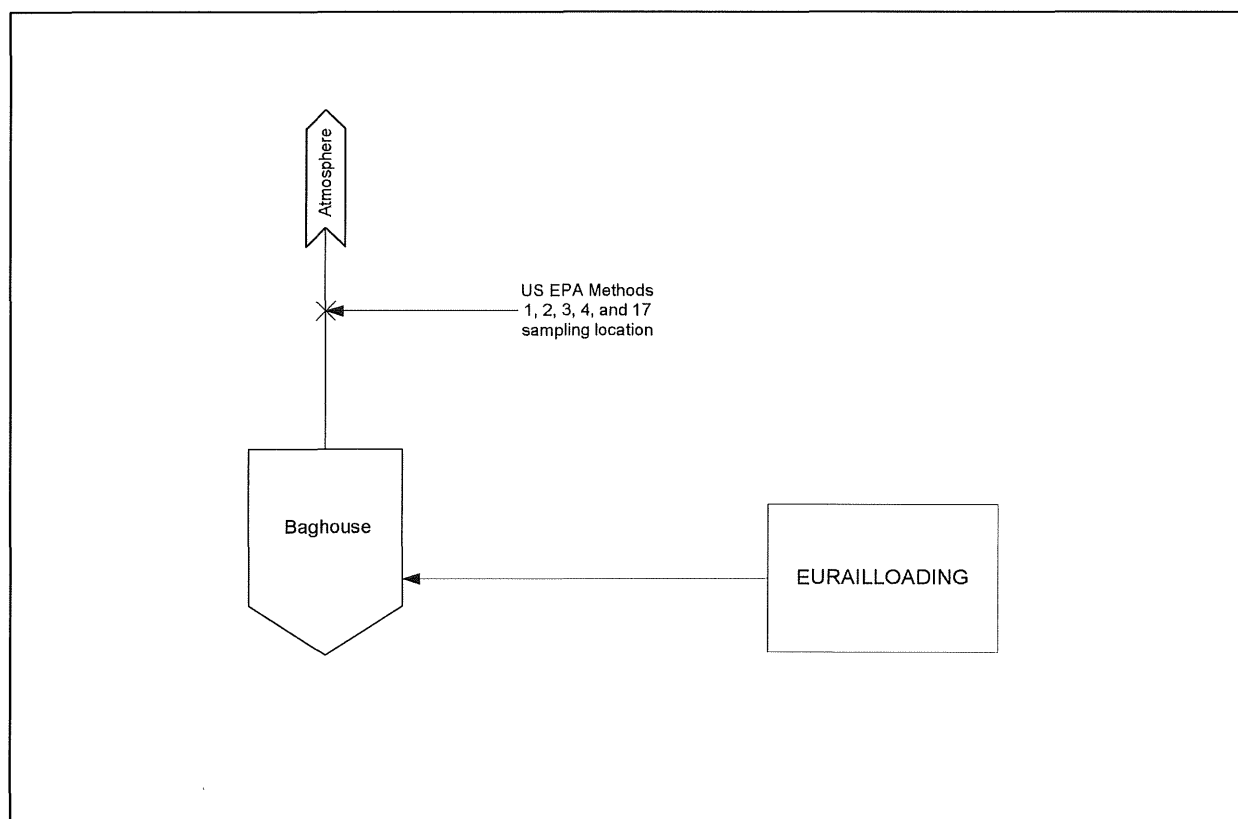
5.3 QUALITY STATEMENT

Montrose is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). Montrose participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by Montrose is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is included in the report appendices. The content of this report is modeled after the EPA Emission Measurement Center Guideline Document (GD-043).

Appendix A.1 Sampling Locations

The Andersons, Inc. - Reading Facility
August 2020 Rail Loadout (EURAILLOADING) Compliance Test

RAIL LOADOUT PROCESS AND SAMPLING LOCATION SCHEMATIC



RAIL LOADOUT BAGHOUSE EXHAUST TRAVERSE POINT LOCATION DRAWING

