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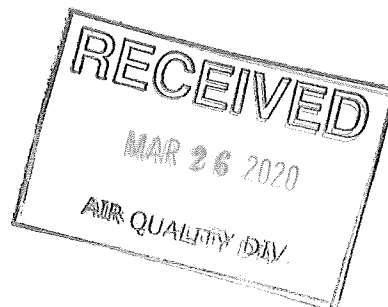
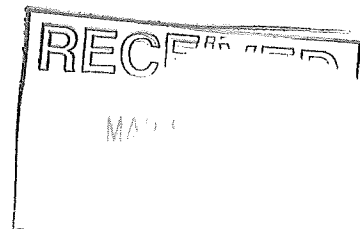
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**SOURCE TEST REPORT
2020 COMPLIANCE EMISSIONS TESTING**

A6240

**CARGILL SALT, INC.
ST. CLAIR, MICHIGAN**

EUSCREENING AND EUDURACUBE



Prepared For:

Cargill Salt, Inc.
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For Submittal To:

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REVIEW AND CERTIFICATION

All work, calculations, and other activities and tasks performed and presented in this document were carried out by me or under my direction and supervision. I hereby certify that, to the best of my knowledge, Montrose operated in conformance with the requirements of the Montrose Quality Management System and ASTM D7036-04 during this test project.

Signature: Steven Smith Date: 03/17/2020

Name: Steve Smith Title: Client Project Manager

I have reviewed, technically and editorially, details calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that, to the best of my knowledge, the presented material is authentic, accurate, and conforms to the requirements of the Montrose Quality Management System and ASTM D7036-04.

Signature: Matthew Young Date: 03/17/2020

Name: Matthew Young Title: District Manager

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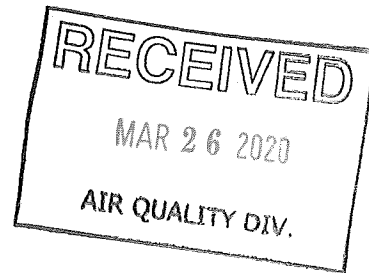
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1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

Cargill Salt, Inc. (Cargill) contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance emissions test program on the EUSCREENING and EUDURACUBE at the Cargill facility located in St. Clair, Michigan. The tests were conducted to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Permit-to-Install No. 167-14A.

The specific objectives were to:

- Verify the filterable particulate matter (FPM) emissions from a common scrubber exhaust stack serving EUSCREENING
- Verify the FPM emissions from a single scrubber exhaust stack serving EUDURACUBE
- 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)
2/18/2020	EUSCREENING	Velocity/Volumetric Flow Rate	EPA 1 & 2	3	60
2/18/2020	EUSCREENING	O ₂ , CO ₂	EPA 3	3	40
2/18/2020	EUSCREENING	Moisture	EPA 4	3	60
2/18/2020	EUSCREENING	FPM	EPA 5	3	60
2/19/2020	EUDURACUBE	Velocity/Volumetric Flow Rate	EPA 1 & 2	3	60
2/19/2020	EUDURACUBE	O ₂ , CO ₂	EPA 3	3	40
2/19/2020	EUDURACUBE	Moisture	EPA 4	3	60
2/19/2020	EUDURACUBE	FPM	EPA 5	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 and 1-3. 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 1-4. The tests were conducted according to the test plan (protocol) dated January 20, 2020 that was submitted to and approved by EGLE.

**TABLE 1-2
SUMMARY OF AVERAGE COMPLIANCE RESULTS -
EUSCREENING
FEBRUARY 18, 2020**

Parameter	Average Results	Emission Limits
Filterable Particulate Matter (FPM)		
g/dscm	0.043	0.5
lb/hr	2.9	3.9

**TABLE 1-3
SUMMARY OF AVERAGE COMPLIANCE RESULTS -
EUDURACUBE
FEBRUARY 19, 2020**

Parameter	Average Results	Emission Limits
Filterable Particulate Matter (FPM)		
lb/1,000 lbs of dry exhaust gases	0.050	0.10

1.2 KEY PERSONNEL

A list of project participants is included below:

Facility Information

Source Location: Cargill Salt, Inc.
916 S. Riverside Avenue
St. Clair, MI 48079

Project Contact: Neil Byers, MS, GSP
Role: EHS Professional
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2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION, OPERATION, AND CONTROL EQUIPMENT

2.1.1 EUSCREENING

The fourth and fifth floor screening and grading operations (EUSCREENING) are comprised of numerous conveyors, screens, a nugget press, and several bagging machines. All equipment is operated indoors within its own enclosure and/or is ducted to a common wet scrubber.

EUSCREENING has a material limit of 245,000 tons of salt per year. The wet scrubber controlling emissions is required to maintain a pressure drop between 4.7- and 8.8-inches water column and a flow rate of at least 36 gallons per minute.

2.1.2 EUDURACUBE

The Duracube system (EUDURACUBE) is used to produce water-softening pellets. Sodium chloride (NaCl) is added to a surge bin. The mixture is sent from the surge bin to a compactor, and then, to a product bin and packaging system. Emissions from EUDURACUBE are controlled by a wet scrubber.

The wet scrubber controlling emissions from EUDURACUBE is required to maintain a pressure drop between 2.4 and 4.2 inches of water and a flow rate of at least 37 gallons per minute.

2.2 FLUE GAS SAMPLING LOCATIONS

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

**TABLE 2-1
 SAMPLING LOCATIONS**

Sampling Location	Stack Inside Diameter (in.)	Distance from Nearest Disturbance		Number of Traverse Points
		Downstream EPA "B" (in./dia.)	Upstream EPA "A" (in./dia.)	
EUSCREENING Scrubber Exhaust Stack	36.5	48.0 / 1.3	72.0 / 2.0	Isokinetic: 24 (12/port)
EUDURACUBE Scrubber Exhaust Stack	25.0	60.0 / 2.4	125.0 / 5.0	Isokinetic: 20 (10/port)

Sample locations were 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 Appendix A.1 for more information.

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2.3 OPERATING CONDITIONS AND PROCESS DATA

EUSCREENING and EUDURACUBE were tested during normal operating 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:

- Pressure drop, inches w.c.
- Flow rate, gpm

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.1.

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. The measurements are made at traverse points specified by EPA Method 1.

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. The second choice is to use stoichiometric calculations to calculate dry molecular weight. The third choice is to use an assigned value of 30.0, in lieu of actual measurements, for processes burning natural gas, coal, or oil.

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

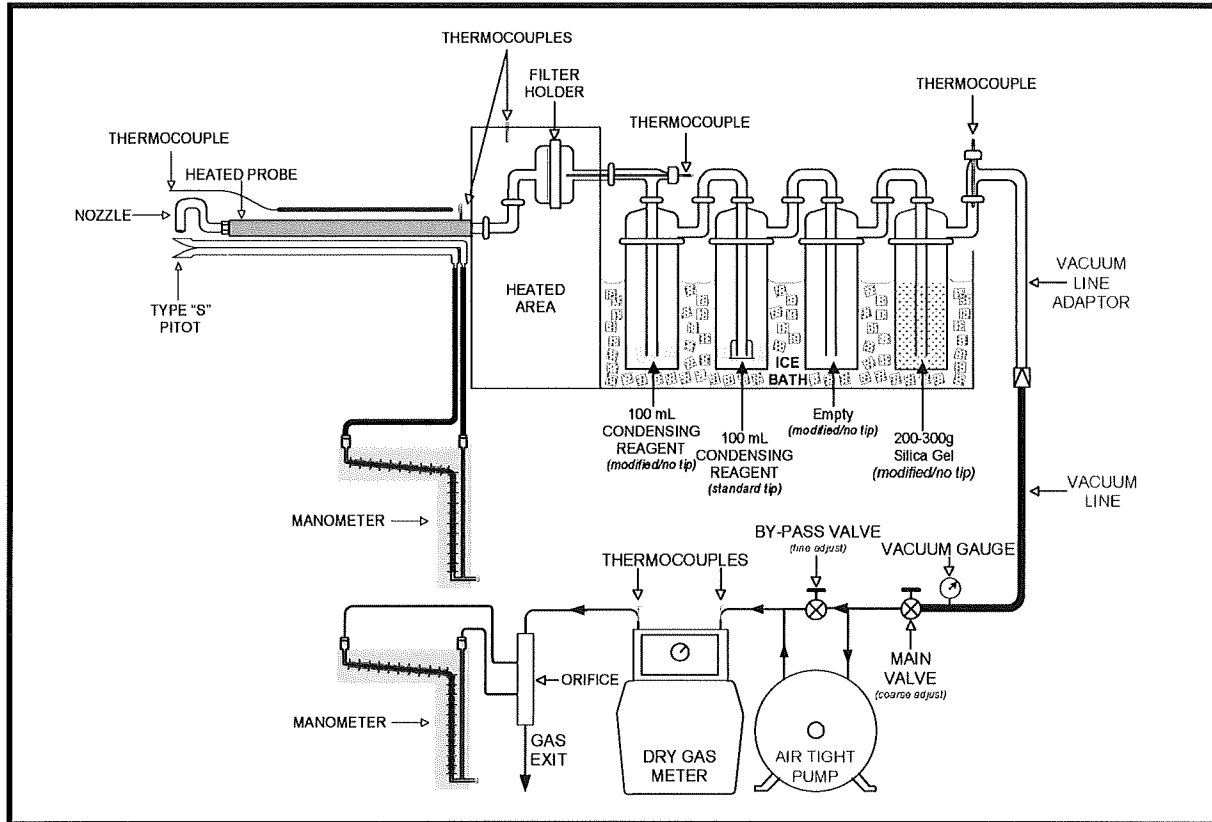
EPA Method 4 is a manual, non-isokinetic method used to measure the moisture content of gas streams. Gas is sampled at a constant sampling rate through a probe and impinger train. Moisture is removed using a series of pre-weighed impingers containing methodology-specific liquids and silica gel immersed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

3.1.5 EPA Method 5, Determination of Particulate Matter from Stationary Sources

EPA Method 5 is a manual, isokinetic method used to measure FPM emissions. The samples are analyzed gravimetrically. This method is performed in conjunction with EPA Methods 1 through 4. The stack gas is sampled through a nozzle, probe, filter, and impinger train. FPM results are reported in emission concentration and emission rate units.

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

FIGURE 3-1
US EPA METHOD 5 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 RESULTS AND DISCUSSION

4.1 FIELD TEST DEVIATIONS AND EXCEPTIONS

No field deviations or exceptions from the test plan or test methods occurred during this test program.

4.2 PRESENTATION OF RESULTS

The average results are compared to the permit limits in Tables 1-2 and 1-3. The results of individual compliance test runs performed are presented in Tables 4-1 and 4-2. 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.

**TABLE 4-1
 FPM EMISSIONS RESULTS -
 EUSCREENING**

Run Number	1	2	3	Average
Date	2/18/2020	2/18/2020	2/18/2020	--
Time	8:30-9:32	9:55-10:57	11:17-12:21	--
Flue Gas Parameters				
O ₂ , % volume dry	21	21	21	21
CO ₂ , % volume dry	0	0	0	0
flue gas temperature, °F	60.0	60.9	61.0	60.6
moisture content, % volume	1.24	1.61	1.60	1.48
volumetric flow rate, dscfm	18,200	18,050	18,178	18,143
Filterable Particulate Matter (FPM)				
g/dscm	0.039	0.046	0.043	0.043
lb/hr	2.6	3.1	2.9	2.9

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**TABLE 4-2
 FPM EMISSIONS RESULTS -
 EUDURACUBE**

Run Number	1	2	3	Average
Date	2/19/2020	2/19/2020	2/19/2020	--
Time	9:13-11:04	11:27-12:30	13:22-14:25	--
Flue Gas Parameters				
O ₂ , % volume dry	21	21	21	21
CO ₂ , % volume dry	0	0	0	0
flue gas temperature, °F	75.0	73.0	74.7	74.2
moisture content, % volume	1.25	1.16	0.96	1.12
volumetric flow rate, dscfm	11,528	11,680	11,563	11,591
Filterable Particulate Matter (FPM)				
gr/dscf	0.030	0.025	0.024	0.026
lb/hr	2.9	2.5	2.4	2.6
lb/1,000 lb-dry exhaust gas	0.057	0.047	0.047	0.050

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA/QC AUDITS

The meter box and sampling train used during sampling performed within the requirements of their respective methods. All post-test leak checks, minimum metered volumes, except where noted, and percent isokinetics met the applicable QA/QC criteria. See section 5.2 for details.

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.

EPA Method 5 analytical QA/QC results are included in the laboratory report. The method QA/QC criteria were met, except if noted in Section 5.2. An EPA Method 5 reagent blank was analyzed. The maximum allowable amount that can be subtracted is 0.001% of the weight of the acetone blank. The blank did not exceed the maximum residue allowed.

5.2 QA/QC DISCUSSION

At the EUSCREENING location, the minimum sample volume required for 40 CFR Subpart OOO was not met for all three runs. Refer to Table US EPA Method 5 Sampling Train Audit Results in Appendix Section D.2 Manual Test Method QA/QC Data for further detail.

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).