08/13/2026

Thomas Garrison
Synthomer Inc.
165 s. Cleveland Ave.
Mogadore, OH 44260

No	TOXIC REVIEW
No	PSD
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
Yes	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
No	MODELING SUBMITTED
No	MAJOR GHG
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

RE: DRAFT AIR POLLUTION PERMIT-TO-INSTALL

Facility ID: 1667000007
Permit Number: P0140919
Permit Type: Administrative Modification
County: Portage

Dear Permit Holder:

A draft of the Ohio Administrative Code (OAC) Chapter 3745-31 Air Pollution Permit-to-Install for the referenced facility has been issued for the emissions unit(s) listed in the Authorization section of the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the permit. A public notice will appear in the Ohio Environmental Protection Agency (Ohio EPA) ***Weekly Review and Public Notices*** website. A copy of the public notice and the draft permit are enclosed. This permit can be accessed electronically on the Ohio EPA document search webpage: ***eDocument Search***. Comments will be accepted as a marked-up copy of the draft permit or in narrative format. Any comments must be sent to the following:

Andrea Moore
Permitting Section
Ohio EPA, DAPC
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

and

Akron Regional Air Quality Management District
1867 West Market St.
Akron, OH 44313

Comments and/or a request for a public hearing will be accepted within 30 days of the date the notice is published on the Ohio EPA ***Weekly Review and Public Notices*** website. You will be notified in writing if a public hearing is scheduled. A decision on issuing a final permit-to-install will be made after consideration of comments received and oral testimony if a public hearing is conducted. Any permit fee that will be due upon issuance of a final Permit-to-Install is indicated in the Authorization section. Please do not submit any payment now. If you have any questions, please contact Akron Regional Air Quality Management District at (330)375-2480.

Sincerely,

Robert Hodanbosi
Chief, Division of Air Pollution Control

cc: U.S. EPA Region 5 - *Via E-Mail Notification*
ARAQMD; Pennsylvania; West Virginia; Canada

PUBLIC NOTICE

The following matters are the subject of this public notice by the Ohio Environmental Protection Agency. The complete public notice, including any additional instructions for submitting comments, requesting information, a public hearing, or filing an appeal may be obtained at: ***Weekly Review and Public Notices | Ohio Environmental Protection Agency*** or Hearing Clerk, Ohio EPA, 50 W. Town St., Columbus, Ohio 43215. Ph: 614-644-3037 email: ***HClerk@epa.ohio.gov***

Draft Air Pollution Permit-to-Install Administrative Modification

Synthomer Inc.
165 S. CLEVELAND AVENUE
Mogadore, OH 44260

ID#: P0140919
Date of Action: 08/13/2026
Permit Desc: Facility-initiated administrative modification to incorporate RACT standards. Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. The above-mentioned permit is a part of Ohio's SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to United States Environmental Protection Agency (U.S. EPA) as a modification of the SIP.
The permit and complete instructions for requesting information or submitting comments may be obtained at: https://ohioepa.commentinput.com - Search by entering permit #P0140919 in the "Search Projects" search box. The public comment period will run until 09/14/2026 at 11:59 PM.

Permit Strategy Write-Up

1. Check all that apply:

   ☐ Synthetic Minor Determination **N/A**

   ☐ Netting Determination **N/A**

2. Source Description:

   Emissions Unit Group 1: P004, P013, P014, P106, P110, and P115 - Synthetic polymer manufacturing. As required by the reclassification to serious nonattainment for ozone under the 2015 ozone National Ambient Air Quality Standards (NAAQS) promulgated by U.S. EPA, this facility has submitted a VOC Reasonably Available Control Technology (RACT) study on March 30, 2026 (subsequently revised on June 4, 2026, June 29, 2026, and July 6, 2026) to address the feasibility of controlling VOC emissions from their synthetic polymer manufacturing operations. This facility does not have any prior source-specific VOC RACT established under OAC rule 3745-21-09. This permit modification includes the implementation of the proposed RACT limits in the July 6, 2026, revision of the RACT study. Section B of this permit cites the RACT limits under OAC rule 3745-21-11(B). The RACT limits are implemented under an OAC rule 3745-31-05(D) synthetic minor restriction for the affected emissions units in section C of this permit.

   Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. This permit is part of Ohio's SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to U.S. EPA as a modification of the SIP.

3. Facility Emissions and Attainment Status:

   Synthomer, Inc. operates under a Title V permitting classification due to the requirement in 40 CFR Part 63, Subpart VVVVVV for area sources with a federally enforceable control device on affected chemical manufacturing process units [§63.11494(e)]. Portage County was designated as serious nonattainment for the 2015 ozone NAAQS but is now a maintenance county. The county is currently designated attainment for all NAAQS (criteria) pollutants which include ozone, $PM_{2.5}$, PM_{10}, CO, NO_2, lead, and SO_2.

4. Source Emissions:

   Emissions units P004, P013, P014, P106, P110, and P115 have VOC emissions that are subject to the VOC RACT requirements. The VOC RACT determination for these emissions unit is venting VOC emissions to a thermal oxidizer with an overall control efficiency of at least 98%, by weight, and includes associated monitoring, record keeping, reporting, and testing requirements.

5. Conclusion:

   This permit modification establishes VOC RACT limits as proposed by Synthomer, Inc. in their VOC RACT study as part of the requirements for the 2015 ozone NAAQs nonattainment and maintenance areas under the reclassification to serious nonattainment for the Cleveland area. The VOC RACT limit established in this permit is equivalent to the previously established OC control efficiency limitation and will be implemented upon final issuance of this permit.

6. Please provide additional notes or comments as necessary:

   None.

7. Total Permit Allowable Emissions Summary (for informational purposes only):

Pollutant	Tons Per Year
OC	2.36
Individual HAP	9.99
Combined HAP	24.99

Ohio Environmental Protection Agency

DRAFT

Division of Air Pollution Control
Permit-to-Install

for

Synthomer Inc.

Facility ID:	1667000007
Permit Number:	P0140919
Permit Type:	Administrative Modification
Issued:	08/13/2026
Effective:	To be entered upon final issuance

Division of Air Pollution Control

Permit-to-Install

for

Synthomer Inc.

Table of Contents

Authorization

Facility ID:	1667000007
Facility Description:	Synthetic Polymer Manufacturing
Application Number(s):	M0008838, M0008840
Permit Number:	P0140919
Permit Type:	Permit-To-Install
Permit Fee:	$0.00 *DO NOT send payment at this time, subject to change before final issuance*
Issue Date:	08/13/2026
Effective Date:	To be entered upon final issuance

This document constitutes issuance of a Permit-to-Install for the emissions unit(s) identified on the following page to:

Synthomer Inc.
165 S. CLEVELAND AVENUE
Mogadore, OH 44260

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Akron Regional Air Quality Management District
1867 West Market St.
Akron, OH 44313
(330)375-2480

The above-named entity is hereby granted this Permit-to-Install for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and Federal laws and regulations and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

John Logue

Director

Authorization (continued)

Permit Number:P0140919

Permit Description:Facility-initiated administrative modification to incorporate RACT standards. Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. The above-mentioned permit is a part of Ohio's SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to United States Environmental Protection Agency (U.S. EPA) as a modification of the SIP.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Group Name:Group 1

Emissions Unit ID:	P004
Company Equipment ID:	Poly/Degas Process
Superseded Permit Number:	P0123931
General Permit Category and Type:	Not Applicable P0123931
Emissions Unit ID:	P013
Company Equipment ID:	Wastewater Effluent System
Superseded Permit Number:	P0123930
General Permit Category and Type:	Not Applicable P0123930
Emissions Unit ID:	P014
Company Equipment ID:	BD Distillation Col.
Superseded Permit Number:	P0123930
General Permit Category and Type:	Not Applicable P0123930
Emissions Unit ID:	P106
Company Equipment ID:	PP In-Mold Coatings
Superseded Permit Number:	P0123930
General Permit Category and Type:	Not Applicable P0123930
Emissions Unit ID:	P110
Company Equipment ID:	PP Poly #1
Superseded Permit Number:	P0123930
General Permit Category and Type:	Not Applicable P0123930
Emissions Unit ID:	P115
Company Equipment ID:	PP Poly #6
Superseded Permit Number:	P0123930
General Permit Category and Type:	Not Applicable P0123930

List of Commonly Used Abbreviations

AP-42 = U.S. EPA's Compilation of Air Pollution Emissions Factors	HVLP = high volume, low pressure	PER = Permit Evaluation Report
ASTM = American Society for Testing and Materials	LAER = lowest achievable emission rate	PM = particulate matter
BACT = Best Available Control Technology	lb(s)/hr = pound(s) per hour	PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns
BAT = Best Available Technology	LDAR = leak detection and repair	$PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
CAA = Clean Air Act	LPG = liquefied petroleum gas/propane	ppb = parts per billion
CAM = compliance assurance monitoring	MACT = maximum achievable control technology	ppm = parts per million
CEMS = continuous emissions monitoring system	MAGLC = maximum acceptable ground level concentration	PSD = Prevention of Significant Deterioration
CFC = chlorofluorocarbon	mg/m3 = milligrams per cubic meter	psi = pounds per square inch
CFR = Code of Federal Regulations	MM = million	psia = pounds per square inch absolute
CH_4 = methane	MMBtu = million British Thermal Units	PTE = potential-to-emit
CI = compression ignition	MSDS = material safety data sheet	PTI = Permit-to-Install
CO = carbon monoxide	MSW = municipal solid waste	PTIO = Permit-to-Install and Operate
CO_2 = carbon dioxide	NAAQS = National Ambient Air Quality Standard	PTO = Permit-to-Operate
COM = continuous opacity monitor	NESHAP = National Emission Standard for Hazardous Air Pollutants	PWR = process weight rate
DAPC = Division of Air Pollution Control	NG = natural gas	RACM = reasonably available control measures
DO/LAA = District Office/Local Air Agency	ng/m3 = nanograms per cubic meter	RACT = reasonably available control technology
dscf = dry standard cubic foot	NH_3 = ammonia	RATA = relative accuracy test audit
EAC = emissions activity category	NMHC = non-methane hydrocarbons	RTO = regenerative thermal oxidizer
eDocs = electronic documents database	NMOC = non-methane organic compound	SB265 = Senate Bill 265
ERAC = Environmental Review Appeals Commission	NO = nitrogen oxide	scfm = standard cubic feet per minute
ESP = electrostatic precipitator	NO_2 = nitrogen dioxide	SI = spark ignition
EU = emissions unit	NO_x = nitrogen oxides	SIP = State Implementation Plan
FEPTIO = Federally Enforceable Permit-to-Install and Operate	NSPS = New Source Performance Standard	SO_2 = sulfur dioxide
FER = Fee Emissions Report	NSR = New Source Review	SSMP = startup, shutdown, and malfunction plan
FR = Federal Register	NTV = Non-Title V	TDS = total dissolved solids
GACT = generally achievable control technology	O&M = operation and maintenance	TLV = threshold limit value
GHG = greenhouse gases	OAC = Ohio Administrative Code	TO = thermal oxidizer
gr/dscf = grains per dry standard cubic foot	OC = organic compound	TPH = ton(s) per hour
H_2S = hydrogen sulfide	Ohio EPA = Ohio Environmental Protection Agency	TPY = ton(s) per year
H_2SO_4 = sulfuric acid	ORC = Ohio Revised Code	TSP = total suspended particulates
HAP = hazardous air pollutant	Pb = lead	VE = visible particulate emissions
HCl = hydrogen chloride	PBR = Permit-By-Rule	VMT = vehicle miles traveled
HF = hydrogen fluoride	PCB = polychlorinated biphenyl	VOC = volatile organic compound
Hg = mercury	PE = particulate emissions	WPP = work practice plan
hp = horsepower	PEMS = predictive emissions monitoring system	µg/m3 = micrograms per cubic meter

A. Standard Terms and Conditions

1. Federally Enforceable Standard Terms and Conditions

a) All Standard Terms and Conditions are federally enforceable, with the exception of those listed below which are enforceable under state law only:

(1) Standard Term and Condition A.2.a), Severability Clause

(2) Standard Term and Condition A.3.c) through A. 3.e), General Requirements

(3) Standard Term and Condition A.6.c), Compliance Requirements

(4) Standard Term and Condition A.9., Reporting Requirements

(5) Standard Term and Condition A.10., Applicability

(6) Standard Term and Condition A.11.b) through A.11.e), Construction of New Source(s) and Authorization to Install

(7) Standard Term and Condition A.14., Public Disclosure

(8) Standard Term and Condition A.15., Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

(9) Standard Term and Condition A.16., Fees

(10) Standard Term and Condition A.17., Permit Transfers

2. Severability Clause

a) A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.

b) All terms and conditions designated in parts B. and C. of this permit are federally enforceable as a practical matter, if they are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA and the state and by citizens (to the extent allowed by section 304 of the Act) under the Act. Terms and conditions in parts B and C of this permit shall not be federally enforceable and shall be enforceable under state law only, only if specifically identified in this permit as such.

3. General Requirements

a) Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act and is grounds for enforcement action or for permit revocation, revocation and re-issuance, or modification.

b) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.

c) This permit may be modified, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.

d) This permit does not convey any property rights of any sort, or any exclusive privilege.

e) The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

4. Monitoring and Related Record Keeping and Reporting Requirements

a) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:

(1) The date, place (as defined in the permit), and time of sampling or measurements.

(2) The date(s) analyses were performed.

(3) The company or entity that performed the analyses.

(4) The analytical techniques or methods used.

(5) The results of such analyses.

(6) The operating conditions existing at the time of sampling or measurement.

b) Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include but not be limited to all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.

c) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:

(1) Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the Akron Regional Air Quality Management District.

(2) Quarterly written reports of (i) any deviations from federally enforceable emission limitations, operational restrictions, and control device operating parameter limitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the Akron Regional Air Quality Management District. The written reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See A.15. below if no deviations occurred during the quarter.

(3) Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, and reporting requirements contained in this permit shall be submitted to the Akron Regional Air Quality Management District every six months, by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semiannual report, which states that no deviations occurred during that period.

(4) This permit is for an emissions unit located at a Title V facility. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

d) The permittee shall report actual emissions pursuant to OAC Chapter 3745-78 for the purpose of collecting Air Pollution Control Fees.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to the Akron Regional Air Quality Management District in accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to OAC rule 3745-15-06.

Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

6. Compliance Requirements

a) All applications, notifications or reports required by terms and conditions in this permit to be submitted or "reported in writing" are to be submitted to Ohio EPA through the Ohio EPA's eBusiness Center: Air Services web service ("Air Services"). Ohio EPA will accept hard copy submittals on an as-needed basis if the permittee cannot submit the required documents through the Ohio EPA eBusiness Center. In the event of an alternative hard copy submission in lieu of the eBusiness Center, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submission of applications, notifications or reports required to be submitted to Ohio EPA fulfills the requirement to submit the required information to the Director, the appropriate Ohio EPA District Office or contracted local air agency, and/or any other individual or organization specifically identified as an additional recipient identified in this permit unless otherwise specified. Consistent with OAC rule 3745-15-03, the electronic signature date shall constitute the date that the required application, notification or report is considered to be "submitted". Any document requiring signature may be represented by entry of the personal identification number (PIN) by responsible official as part of the electronic submission process or by the scanned attestation document signed by the Authorized Representative that is attached to the electronically submitted written report.

Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete

b) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:

(1) At reasonable times, enter upon the permittee's premises where a source is located, or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.

(3) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.

(4) As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.

c) The permittee shall submit progress reports to the Akron Regional Air Quality Management District concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:

(1) Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.

(2) An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

7. Best Available Technology

As specified in OAC Rule 3745-31-05, new sources that must employ Best Available Technology (BAT) shall comply with the Applicable Emission Limitations/Control Measures identified as BAT for each subject emissions unit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Reporting Requirements

The permittee shall submit required reports in the following manner:

a) Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the Akron Regional Air Quality Management District.

b) Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from state-only required emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the Akron Regional Air Quality Management District. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

10. Applicability

This permit-to-install is applicable only to the emissions unit(s) identified in the permit-to-install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s) not exempt from the requirement to obtain a permit to install.

11. Construction of New Sources(s) and Authorization to Install

a) This permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. This permit does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the application and terms and conditions of this permit. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of this permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Issuance of this permit is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.

b) If applicable, authorization to install any new emissions unit included in this permit shall terminate within eighteen months of the effective date of the permit if the owner or operator has not undertaken a continuing program of installation or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation. This deadline may be extended once by twelve months if application is made to the Director within a reasonable time before the termination date and the permittee shows good cause for any such extension.

c) The permittee may notify Ohio EPA of any emissions unit that is permanently shut down (i.e., the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31) by submitting a certification from the authorized official that identifies the date on which the emissions unit was permanently shut down. Authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. At a minimum, notification of permanent shut down shall be made or confirmed by marking the affected emissions unit(s) as "permanently shut down" in "Air Services" along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update electronically will constitute notifying the Director of the permanent shutdown of the affected emissions unit(s).

d) The provisions of this permit shall cease to be enforceable for each affected emissions unit after the date on which an emissions unit is permanently shut down (i.e., emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31). All records relating to any permanently shut down emissions unit, generated while the emissions unit was in operation, must be maintained in accordance with law. All reports required by this permit must be submitted for any period an affected emissions unit operated prior to permanent shut down. At a minimum, the permit requirements must be evaluated as part of the reporting requirements identified in this permit covering the last period the emissions unit operated.

Unless otherwise exempted, no emissions unit certified by the responsible official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31 and OAC Chapter 3745-77 if the restarted operation is subject to one or more applicable requirements.

e) The permittee shall comply with any residual requirements related to this permit, such as the requirement to submit a deviation report, air fee emission report, or any other reporting required by this permit for the period the operating provisions of this permit were enforceable, or as required by regulation or law. All reports shall be submitted in a form and manner prescribed by the Director. All records relating to this permit must be maintained in accordance with law.

12. Permit-To-Operate Application

The permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77. The permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve months after commencing operation of the emissions units covered by this permit. However, if operation of the proposed new or modified source(s) as authorized by this permit would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d) must be obtained before operating the source in a manner that would violate the existing Title V permit requirements.

13. Construction Compliance Certification

The applicant shall identify the following dates in the "Air Services" facility profile for each new emissions unit identified in this permit.

a) Completion of initial installation date shall be entered upon completion of construction and prior to start-up.

b) Commence operation after installation or latest modification date shall be entered within 90 days after commencing operation of the applicable emissions unit.

14. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

15. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

16. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable permit-to-install fees within 30 days after the issuance of any permit-to-install. The permittee shall pay all applicable permit-to-operate fees within thirty days of the issuance of the invoice.

17. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The new owner must update and submit the ownership information via the "Owner/Contact Change" functionality in "Air Services" once the transfer is legally completed. The change must be submitted through "Air Services" within thirty days of the ownership transfer date.

18. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

19. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

B. Facility Wide Terms and Conditions

1. All the following facility-wide terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

   a) None.

2. OAC rule 3745-21-11(B) VOC RACT Requirements

   As required by the reclassification to serious nonattainment for ozone under the 2015 ozone National Ambient Air Quality Standards promulgated by U.S. EPA, and pursuant to OAC rule 3745-21-11(B) and the VOC Reasonable Available Control Technology (RACT) Study submitted by Synthomer Inc. on March 30, 2026 (subsequently revised on June 4, 2026, June 29, 2026, and July 6, 2026):

   "Synthomer Inc." (facility ID: 1667000007) or any subsequent owner or operator of the "Synthomer Inc." facility located at 165 South Cleveland Avenue, Mogadore, Ohio shall comply with the following requirements:

   a) The VOC emissions from emissions units P004, P013, P014, P106, P110 and P115, shall be vented to a thermal oxidizer with an overall control efficiency of at least 98%, by weight.

3. Monitoring and/or Recordkeeping Requirements

   a) In order to maintain compliance with the applicable emission limitation(s) contained in this permit, the acceptable average combustion temperature within the thermal oxidizer, for any 3-hour block of time when one or more of the emissions units controlled by the thermal oxidizer are in operation, shall not be more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance.

   b) The permittee shall properly install, operate, and maintain a continuous temperature monitor and recorder that measures and records the combustion temperature within the thermal oxidizer when one or more of the emissions units are in operation, including periods of startup and shutdown. Units shall be in degrees Fahrenheit (°F). The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within ±1% of the temperature being measured or ±5°F, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and the operating manuals, with any modifications deemed necessary by the permittee.

   c) The permittee shall collect and record the following information each day when one or more of the emissions units are in operation for the thermal oxidizer:

      (1) all 3-hour blocks of time, when one or more of the emissions units controlled by a thermal oxidizer were in operation, during which the average combustion temperature within the

thermal oxidizer was more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance; and

(2) a log or record of the operating time for the capture (collection) system, the thermal oxidizer, the monitoring equipment, and the associated emissions units.

d) Whenever the monitored average combustion temperature within the thermal oxidizer deviates from the range or limit established in accordance with this permit, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation:

(1) the date and time the deviation began;

(2) the magnitude of the deviation at that time;

(3) the date the investigation was conducted;

(4) the name(s) of the personnel who conducted the investigation; and

(5) the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable range/limit specified in this permit, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken:

(6) a description of the corrective action;

(7) the date corrective action was completed;

(8) the date and time the deviation ended;

(9) the total period of time (in minutes) during which there was a deviation;

(10) the temperature readings immediately after the corrective action was implemented; and

(11) the name(s) of the personnel who performed the work.

Investigation and records required by this paragraph do not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

4. Reporting Requirements

a) The permittee shall submit quarterly summaries of the following records for the thermal oxidizer:

(1) all 3-hour blocks of time when one or more of the emissions units were in operation during which the average combustion temperature within the thermal oxidizer was more than 50°F below the average temperature maintained during the most recent performance test that demonstrated the emissions units were in compliance; and

(2) a log of the operating time for the capture system, the thermal oxidizer, the monitoring equipment, and the emissions units.

The quarterly reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions in Section A of this permit.

5. Testing Requirements

a) The permittee shall conduct, or have conducted, emissions testing for emissions units P004, P013, P014, P106, P110, and P115 per the following requirements:

(1) The emissions testing shall be conducted within 6 months prior to February 23, 2027.

(2) The emissions testing shall be conducted to demonstrate compliance with the overall control efficiency limitation for VOC. No capture testing is required because the emissions units listed above are a closed system (emissions are hard piped to the control equipment) with 100% capture efficiency.

(3) The control efficiency (that is, the percent reduction in mass emissions between the inlet and outlet of the control system) shall be determined per the test methods and procedures specified in OAC rule 3745-21-10 or an alternative test protocol approved by Ohio EPA. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and the total concentration, and on a consideration of the potential presence of interfering gases.

(4) During the emissions testing, the EUs shall be operated under operational conditions approved in advance by the appropriate Ohio DO/LAA. Operational conditions that may need to be approved include, but are not limited to, the production rate, the type of material processed, material make-up (solvent content, etc.) or control equipment operational limitations (burner temperature, precipitator voltage, etc.). In general, testing shall be done under worst-case conditions expected during the life of the permit. As part of the information provided in the Intent-to-Test (ITT) notification form described below, the permittee shall provide a description of the EU operational conditions they will meet during the emissions testing and describe why they believe worst-case operating conditions will be met. Prior to conducting the test(s), the permittee shall confirm with the appropriate Ohio EPA DO/LAA that the proposed operating conditions constitute worst-case. Failure to test under the approved conditions may result in Ohio EPA not accepting the test results as a demonstration of compliance.

(5) Not later than 30 days prior to the proposed test date(s), the permittee shall submit an ITT notification to the appropriate Ohio EPA DO/LAA. The ITT notification shall describe in detail the proposed test methods and procedures, the EU operating parameters, the time(s) and date(s) of the test(s) and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA DO/LAA's refusal to accept the results of the emission test(s).

(6) Personnel from the appropriate Ohio EPA DO/LAA shall be permitted to witness the test(s), examine the testing equipment and acquire data and information necessary to ensure that the operation of the EUs and the testing procedures provide a valid characterization of the emissions from the EUs and/or the performance of the control equipment.

(7) A comprehensive written report on the results of the emissions test(s) shall be signed by the person(s) responsible for the tests and submitted to the appropriate Ohio EPA DO/LAA within

30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the appropriate Ohio EPA DO/LAA.

6. The following EUs are subject to 40 CFR Part 63, Subpart VVVVVV - NESHAP for Chemical Manufacturing Area Sources: P004, P013, P014, P110, and P115. The complete GACT requirements, including the General Provisions, may be accessed via the internet from the e-CFR website http://www.ecfr.gov/ or by contacting the appropriate Ohio EPA DO/LAA.

a) In accordance with 40 CFR 63.11494(a) and (b), the EUs listed above are part of a chemical manufacturing process with a specified Table 1 HAP and located at an area source of HAP emissions. The permittee shall comply with the applicable requirements under 40 CFR Part 63, Subpart VVVVVV, including the following sections:

§63.11494(d) and (f)	Affected sources and compliance dates
§63.11494(e)	Area source requirement to obtain a Title V permit
§63.11495(a)	Management practices
§63.11495(a)(1)	Process vessel covers
§63.11495(a)(2)	Transfer of liquids to tank trucks or railcars
§63.11495(a)(3)	Inspection of process vessels
§63.11495(a)(4)	Leak repair
§63.11495(a)(5)	Records of inspections and equipment repairs
§63.11495(b)	Small heat exchange systems
§63.11495(c)	SSM provisions in referenced subparts do not apply
§63.11495(d)	General duty for minimizing emissions
§63.11496(a); Table 2	Organic HAP emissions from batch process vents
§63.11496(b)	No applicable continuous processes vents
§63.11496(c)	No applicable combined streams
§63.11496(d)	No applicable halogenated streams
§63.11496(e)	Exceptions to the alternative standard for organic HAP
§63.11496(f)	No applicable metal HAP process vents
§63.11496(g)	Exceptions and alternatives to 40 CFR Part 63, Subpart SS
§63.11496(h)	No applicable surge control vessels or bottoms receivers
§63.11496(i)	SSM provisions in referenced subparts do not apply
§63.11497	No applicable storage tanks

§63.11498(a); Table 6	Compliance requirements for wastewater systems
§63.11499	No applicable heat exchange systems
§63.11501(a); Table 9	Applicability of General Provisions
§63.11501(b)	Notification of compliance status
§63.11501(c)	Recordkeeping requirements
§63.11501(d)	Semiannual compliance reports
§63.11501(e)	Affirmative defense for malfunctions
§63.11502	Definitions
§63.11503	Implementation and enforcement

C. Emissions Unit Terms and Conditions

1. Emissions Unit Group - Group 1: P004, P013, P014, P106, P110, and P115

EU ID	Operations, Property and/or Equipment Description
P004	Latex and Resin Polymerization & Degassing Process
P013	Pretreatment of process wastewater prior to discharge to the publicly owned treatment works (POTW) - Wastewater Effluent System
P014	Butadiene distillation column, overhead condenser, reflux drum, reboiler, pumps; vented to an existing Process Combustion Corp Thermal Incinerator
P106	Pilot Plant in-mold coatings production
P110	Manufacture of polymers for R&D purposes, and from scale-up and semi-works operations
P115	Manufacture of polymers for R&D purposes, and from scale-up and semi-works operations

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) d)(11), d)(12), d)(13), d)(14) and e)(4).

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3)	Hourly mass emissions* from the thermal oxidizer shall not exceed the following limits: 5.31 lbs/hr OC, measured as methane; 1.41 lbs/hr 1,3-butadiene; 1.81 lbs/hr styrene; and 2.50 lbs/hr NO_X. *The hourly allowable mass emission limitations are established for emissions units P004, P013, P014, P106, P110 and P115, combined. For emissions units P004, P013, P014, P106, P110 and P115, the thermal oxidizer shall achieve at least 98% overall control efficiency, by weight, for OC.

b.	OAC rule 3745-21-07(M)(3)(iii)	Emissions units P013, P014, P106, P110 and P115 are not subject to OAC rule 3745-21-07(M)(3)(a) and (M)(3)(b) because these emissions units are subject to and complying with a BAT requirement, pursuant to OAC rule 3745-31-05, which specifies an overall control efficiency for OC that is greater than 85%, by weight.
c.	OAC rule 3745-31-05(D) [Federally enforceable requirements to avoid 40 CFR Part 63, Subparts U, JJJ, FFFF, and OAC rule 3745-21-14 applicability, and to comply with OAC rule 3745-21-11(B)]	See Facility-Wide Terms and Conditions B.2. through B.5. above. Emissions of styrene from the facility shall not exceed 5.0 tpy, based upon a rolling, 12-month summation of the monthly emissions. The OC emissions from emissions units P004, P013, P014, P106, P110 and P115 shall be vented to the thermal oxidizer. However, if the thermal oxidizer is not operational due to a malfunction or maintenance, OC emissions from only the styrene-acrylic polymer expansion process of emissions unit P004 may be vented to the atmosphere through the second-stage vacuum system for a maximum of 100 hours per year as long as the requirements of OAC rule 3745-15-06 are met. The OC emissions from the thermal oxidizer and the second-stage vacuum system, combined, shall not exceed 2.36 tpy, based upon a rolling, 12-month summation of the monthly emissions. HAP emissions from this facility shall not exceed 9.99 tpy for any individual HAP and 24.99 tpy for combined HAPs, based upon rolling, 12-month summation of the monthly emissions. The thermal oxidizer shall achieve at least 98% overall control efficiency, by weight, for OC.
d.	40 CFR Part 63, Subpart VVVVVV [40 CFR 63.11494 – 63.11503]	See Facility-Wide Terms and Conditions B.6. above.

e.	40 CFR Part 63, Subpart A [40 CFR 63.1 - 63.15]	General Provisions.

(2) Additional Terms and Conditions

a. See Facility-Wide Terms and Conditions B.2.a) above.

b. The wastewater "bottoms" stream from the continuous steam stripping equipment may be piped to the existing wastewater effluent basin or directly to the city-owned sewer system below-grade. The basin shall be equipped with a cover, and the emissions from the wastewater beneath the cover shall be vented to the ambient air from a stack at a height of 70 feet above grade.

c) Operational Restrictions

(1) The thermal oxidizer shall be operated whenever OC emissions may be vented to it.

(2) Continuous steam stripping equipment shall be employed and maintained to remove OC from the wastewater exiting the condensate pretreatment tanks. OC emissions from the continuous steam stripping equipment shall be vented to the thermal oxidizer.

d) Monitoring and/or Recordkeeping Requirements

(1) See Facility-Wide Terms and Conditions B.3. above.

(2) In order to maintain compliance with the applicable emission limitation(s) contained in this permit, the acceptable average combustion chamber temperature within the thermal oxidizer, during any 3-hour period of time when one or more of the emissions units controlled by the thermal oxidizer are in operation, shall not be more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance.

(3) The permittee shall properly install, operate, and maintain a continuous temperature monitor and recorder that measures and records the combustion temperature within the thermal oxidizer when one or more of the emissions units are in operation. Units shall be in degrees Fahrenheit. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within ±1% of the temperature being measured or ±5°F, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and the operating manuals. The permittee shall collect and record the following information each day the emissions units are in operation:

a. all 3-hour blocks of time, when one or more of the emissions units controlled by the thermal oxidizer were in operation, during which the average combustion chamber temperature within the thermal oxidizer was more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance; and

b. a log (date and total time) of the downtime or bypass of the capture (collection) system and thermal oxidizer, and/or downtime of the monitoring equipment, when one or more of the associated emissions units were in operation.

(4) Whenever the monitored average combustion chamber temperature within the thermal oxidizer deviates from the range or limit established in accordance with this permit, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation:

a. the date and time the deviation began;

b. the magnitude of the deviation at that time;

c. the date the investigation was conducted;

d. the name(s) of the personnel who conducted the investigation; and

e. the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable range/limit specified in this permit, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken:

f. a description of the corrective action;

g. the date corrective action was completed;

h. the date and time the deviation ended;

i. the total period of time (in minutes) during which there was a deviation;

j. the temperature readings immediately after the corrective action was implemented; and

k. the name(s) of the personnel who performed the work.

Investigation and records required by this paragraph do not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

The temperature range/limit is effective for the duration of this permit, unless revisions are requested by the permittee and approved in writing by the appropriate Ohio EPA DO/LAA. The permittee may request revisions to the permitted temperature range/limit based upon information obtained during future performance tests that demonstrate compliance with the allowable emission rate(s) for the controlled pollutant(s). In addition, approved revisions to the temperature range/limit will not constitute a relaxation of the monitoring requirements of this permit and may be incorporated into this permit by means of a minor permit modification.

(5) The permittee shall maintain a leak detection and repair program for pumps, valves and flanges in styrene, butadiene, and acrylonitrile service as indicated below:

a. Except as provided in d)(5)c. below, pumps, valves and flanges in styrene, butadiene, and acrylonitrile service shall be inspected for signs of leakage monthly using visual, audible, and/or olfactory methods.

b. Except as provided in d)(5)c. below, pumps and valves in styrene, butadiene, and acrylonitrile service shall be monitored for leaks once each six calendar months in accordance with the method specified in OAC rule 3745-21-10(F).

c. Excluded from the above monitoring requirements are any pumps in styrene, butadiene, and acrylonitrile service that are equipped with double mechanical seals. Pumps with double mechanical seals will be inspected for signs of leakage monthly as described in d)(5)a. above. Also, valves that are designated as difficult to inspect or monitor (valves which cannot be monitored without elevating the monitoring personnel more than six feet above a support surface) shall be inspected and monitored once each calendar year.

d. Flanges in styrene, butadiene, and acrylonitrile service shall be monitored for leaks once each 12 calendar months in accordance with the method specified in OAC rule 3745-21-10(F).

e. A leak is defined as visible frost (from butadiene pumps, valves or flanges) or drips (from styrene or acrylonitrile pumps, valves or flanges), a strong, distinctive odor (from the pump seal, valve or flange), or an organic vapor analyzer reading in excess of 10,000 parts per million by volume ("ppmv") for pumps, 5,000 ppmv for valves, and 1,000 ppmv for flanges.

f. If a leak is discovered, it shall be repaired within 30 calendar days. However, a first attempt at repair shall be made within five calendar days.

g. Any pump or valve from which a leak has been detected shall be monitored within five working days of being repaired, using an organic vapor analyzer. A reading below 2,000 ppmv for pumps, 1,000 ppmv for valves and 500 ppmv for flanges indicates a successful repair.

(6) To demonstrate the effectiveness of the leak detection and repair program, the permittee shall maintain the following records:

a. A list of identification numbers for all pumps, valves, and flanges in styrene, butadiene, and acrylonitrile service shall be recorded in a log that is kept in a readily accessible location.

b. When a leak is detected as described in d)(5)e. above, the following information shall be recorded in the leak repair log:

i. The identification number of the leaking equipment.

ii. The basis for detection of the leak, for example, monitoring, visual inspection, or sensor.

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment.

iv. The methods of repair applied in each attempt to repair the leaking equipment.

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) if the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured, in ppmv.

vi. If the leak is not repaired within 30 calendar days after the date on which it was detected, record the following:

(a) "repair delayed" and the reason for the delay;

(b) if the repair is being delayed until the next process shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process shutdown;

(c) the expected date of successful repair of the leak; and

(d) the dates of process unit shutdowns that occur while the leaking equipment is unrepaired.

vii. The date on which the leak was successfully repaired.

(7) The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

(8) The permittee shall maintain monthly records of the total facility emissions for each individual HAP and combined HAPs. The permittee also shall maintain monthly records of the rolling, 12-month summation of the total facility emissions for each individual HAP and combined HAPs.

(9) In order to determine compliance with the rolling, 12-month OC emission limitation for the thermal oxidizer and the second-stage vacuum system, combined, the permittee shall maintain monthly records of the following information for emissions units P004, P013, P014, P106, P110 and P115:

a. For emissions units P004, P110 and P115, the permittee shall maintain the following monthly records:

i. the amount of OC charged, in ton(s);

ii. the amount of OC converted to product (i.e., product yield), in ton(s);

iii. the amount of unreacted OC remaining in the finished product after degassing, in ton(s);

iv. the amount of unreacted OC routed to the vacuum condensers during degassing, in ton(s);

v. the amount of OC routed from the vacuum condensers to the thermal oxidizer via the primary vacuum system, in ton(s);

vi. the amount of OC routed from the vacuum condensers to the steam stripping column in the liquid condensate, in ton(s);

vii. the amount of OC routed from the steam stripping column to the thermal oxidizer, (i.e., d)(9)a.vi. x column efficiency), in ton(s);

viii. the amount of OC routed from the steam stripping column to the wastewater system in the bottoms, (i.e., d)(9)a.vi. x (1 - column efficiency)), in ton(s);

ix. the amount of OC emitted from the thermal oxidizer, (i.e., d)(9)a.v. + d)(9)a.vii.) x (1- control efficiency), in ton(s);

x. the amount of OC from the styrene-acrylic polymer expansion process that is vented to the atmosphere through the second-stage vacuum system, in ton(s); and

xi. the amount of OC emitted from the thermal oxidizer and second-stage vacuum, (i.e., d)(9)a.ix. + d)(9)d.x.), in ton(s).

b. For emissions unit P013, the permittee shall maintain the following monthly records:

i. the amount of OC routed from the vacuum condensers to the steam stripping column in the liquid condensate (same as d)(9)a.vi. above), in ton(s);

ii. the amount of OC routed from the steam stripping column to the thermal oxidizer (same as d)(9)a.vii. above), in ton(s);

iii. the amount of OC routed from the steam stripping column to the wastewater system in the bottoms (same as d)(9)a.viii. above), in ton(s);

iv. the amount of OC emitted from the thermal oxidizer (same as d)(9)a.ix. above), in ton(s); and

v. the amount of OC emitted from the wastewater system, as determined by results of periodic wastewater sampling and EPA-approved wastewater emissions modeling software, in ton(s).

c. For emissions unit P014, the permittee shall maintain the following monthly records:

i. the amount of OC charged to the distillation column, in ton(s);

ii. the amount of OC recovered and recycled to the storage tanks, in ton(s);

iii. the amount of OC routed to the heavies (waste) tank, in ton(s);

iv. the amount of OC routed to the thermal oxidizer from the heavies tank, in ton(s); and

v. the amount of OC emitted from the thermal oxidizer, in ton(s).

d. For emissions unit P106, the permittee shall maintain the following monthly records:

i. the amount of organic compounds (OC) charged, in ton(s);

ii. the amount of OC in the finished product, in ton(s);

iii. the amount of OC routed to the thermal oxidizer via the Pilot Plant's vacuum system, in ton(s); and

iv. the amount of OC emitted from the thermal oxidizer, in ton(s).

e. For P004, P013, P014, P106, P110 and P115, combined, the permittee shall maintain the following monthly records:

i. The total amount of OC emitted from the thermal oxidizer and second-stage vacuum system, (i.e., d)(9)a.xi. + d)(9)c.v. + d)(9)d.iv.), in ton(s); and

ii. the rolling, 12-month summation of the monthly emissions of OC for the thermal oxidizer and the second-stage vacuum system for each calendar month.

(10) For emissions unit P004, the permittee shall maintain monthly records of the amount of time the styrene-acrylic polymer expansion process was vented to atmosphere through the second-stage vacuum system.

(11) The PTI application for emissions units, P004, P013, P014, P106, P110 and P115, was evaluated based on the actual materials and the design parameters of the emissions units' exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to these emissions units for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions units, (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):

i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or

ii. short term exposure limit (STEL) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.

b. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).

c. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "X" hours per day and "Y" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the MAGLC:

$TLV/10 \times 8/X \times 5/Y = 4\ TLV/XY = MAGLC$

d. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: acrylonitrile (CAS 107-13-1)
TLV (mg/m^3): 4.34
Maximum Hourly Emission Rate (lbs/hr): 5.31
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m^3): 75
MAGLC (ug/m^3): 103

Toxic Contaminant: 1,3-butadiene (CAS 106-99-0)
TLV (mg/m^3): 4.42
Maximum Hourly Emission Rate (lbs/hr): 1.41
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m^3): 8.54
MAGLC (ug/m^3): 105.2

Toxic Contaminant: styrene (CAS 100-42-5)
TLV (mg/m^3): 85.2
Maximum Hourly Emission Rate (lbs/hr): 1.81
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m^3): 10.96
MAGLC (ug/m^3): 2,028.6

The permittee, has demonstrated that emissions of acrylonitrile (1,3-butadiene, hexane and styrene), from emissions units P004, P013, P014, P106, P110, and P115, are calculated to be less than 80% of the MAGLC; any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

(12) Prior to making any physical changes to or changes in the method of operation of the emissions units, that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration, the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:

a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower TLV than the lowest TLV previously modeled;

b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and

c. physical changes to the emissions units or their exhaust parameters (e.g., increased/decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the “Toxic Air Contaminant Statute” will be satisfied for the above changes, Ohio EPA will not consider the change(s) to be a “modification” under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a “modification”, the permittee shall apply for and obtain a final PTI prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

(13) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F):

a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);

b. the MAGLC for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F);

c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and

d. the documentation of the initial evaluation of compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.

(14) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.

e) Reporting Requirements

(1) See Facility-Wide Terms and Conditions B.4. above.

(2) The permittee shall submit quarterly deviation (excursion) reports that identify:

a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the potential to emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

i. each 3-hour period of time (start time and date, and end time and date) when the average combustion chamber temperature within the thermal oxidizer was more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance;

ii. any period of time (start time and date, and end time and date) when one or more of the emissions units were in operation and the process emissions were not vented to the thermal oxidizer;

iii. all exceedances of the rolling, 12-month emission limitation for OC;

iv. all exceedances of the rolling, 12-month emission limitation for any individual HAP;

v. all exceedances of the rolling, 12-month emission limitation for styrene; and

vi. all exceedances of the rolling, 12-month emission limitation for combined HAPs.

b. the probable cause of each deviation (excursion);

c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and

d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted each year by January 31 (covering October to December), April 30 (covering January to March), July 31 (covering April to June), and October 31 (covering July to September), unless an alternative schedule has been established and approved by the Director (the appropriate Ohio EPA DO/LAA).

(3) For emissions units P004, P014, P106, P110 and P115, semiannual reports shall be submitted to the Director (the appropriate Ohio EPA DO/LAA) by the first day of February and August and shall include the following information for each month during the preceding semiannual period:

a. the number of pumps in styrene, butadiene or acrylonitrile service for which leaks were detected as described in d)(5)e. above;

b. the number of valves in styrene, butadiene or acrylonitrile service for which leaks were detected as described in d)(5)e. above;

c. the number of flanges in styrene, butadiene or acrylonitrile service for which leaks were detected as described in d)(5)e. above;

d. the number of pumps, valves and/or flanges in styrene, butadiene or acrylonitrile service for which leaks were not repaired within thirty calendar days after detection of the leak; and

e. the facts that explain each delay of repair.

(4) For emissions units P004, P013, P014, P106, P110 and P115, the permittee shall submit annual reports that include any changes to any parameter or value used in the dispersion model used to demonstrate compliance with the "Toxic Air Contaminate Statute", ORC 3704.03(F), through the predicted 1-hour maximum concentration. The report should include:

a. the original model input;

b. the updated model input;

c. the reason for the change(s) to the input parameter(s); and

d. a summary of the results of the updated modeling, including the input changes; and

e. a statement that the model results indicate that the 1-hour maximum ground-level concentration is less than 80% of the MAGLC.

If no changes to the emissions, emissions unit(s), or the exhaust stack have been made during the reporting period, then the report shall include a statement to that effect.

(5) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through Ohio EPA's eBusiness Center: Air Services online web portal.

f) Testing Requirements

(1) See Facility-Wide Terms and Conditions B.5. above.

(2) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation

5.31 lbs/hr of OC, measured as methane

Applicable Compliance Method

If required in writing by the Director (the appropriate Ohio EPA DO/LAA), the permittee shall demonstrate compliance with the hourly allowable emission limitation above based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A.

b. Emissions Limitation

1.41 lbs/hr of 1,3-butadiene

1.81 lbs/hr of styrene

Applicable Compliance Method

Compliance with hourly allowable emission limitations above shall be demonstrated multiplying the maximum hourly uncontrolled emission rate, in pounds per hour, by (1-X*).

*"X" is the control efficiency for the control equipment as determined during the most recent emission test that demonstrated that the emissions units were in compliance.

Note: The capture efficiency is considered 100% because the emissions units are closed systems (emissions are hard piped to the control equipment).

If required in writing by the Director (the appropriate Ohio EPA DO/LAA), the permittee shall demonstrate compliance with the hourly allowable emission limitations above based on the results of emission testing conducted in accordance with Methods 1-4 and 18 of 40 CFR Part 60, Appendix A.

c. Emissions Limitation

2.50 lbs/hr of NO_X

Applicable Compliance Method

If required in writing by the Director (the appropriate Ohio EPA DO/LAA), the permittee shall demonstrate compliance with the hourly allowable NO_X emission limitation above based on the results of emission testing conducted in accordance with Methods 1-4 and 7, 7A or 7E, as appropriate, of 40 CFR Part 60, Appendix A.

d. Emissions Limitation

The thermal oxidizer shall achieve at least 98% overall control efficiency, by weight, for OC.

Applicable Compliance Method

If required in writing by the Director (the appropriate Ohio EPA DO/LAA), the permittee shall demonstrate compliance with the overall control efficiency emission limitation above based on the results of emission testing conducted in accordance with Methods 1-4 and 18, 25 or 25A, as appropriate, of 40 CFR Part 60, Appendix A.

e. Emissions Limitation

The OC emissions from the thermal oxidizer and the second-stage vacuum system, combined, shall not exceed 2.36 tpy, based upon a rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method

Compliance with the annual allowable OC emission limitation above shall be demonstrated through the record keeping requirements established in d)(9) above.

f. Emissions Limitations

Emissions of styrene from the facility shall not exceed 5.0 tpy, based upon a rolling, 12-month summation of the monthly emissions.

HAP emissions from this facility shall not exceed 9.99 tpy for any individual HAP and 24.99 tpy for combined HAPs, based upon rolling, 12-month summation of the monthly emissions.

Applicable Compliance Method

Compliance with the annual allowable emission limitations above shall be demonstrated through the record keeping requirements established in d)(8) above.

g) Miscellaneous Requirements

(1) None.

ALL4

Reasonably Available Control Technology Analysis

Synthomer – Mogadore, OH

July 2026

Submitted by:

Synthomer Inc.
165 South Cleveland Avenue
Mogadore, OH 44260

Submitted to:

Akron Regional Air Quality Management District
1867 West Market Street
Akron, OH 44313

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1. INTRODUCTION

Synthomer Inc. (Synthomer), operates a synthetic polymer resin manufacturing facility (Facility) at 165 South Cleveland Avenue in Mogadore, Summit County, Ohio (OH). Synthomer is authorized to operate the Facility under Title V Operating Permit (TVOP) No. P0129497 and Facility ID 1667000007 issued by the Ohio Environmental Protection Agency (Ohio EPA) and managed by the Akron Regional Air Quality Management District (ARAQMD). In accordance with Ohio Administrative Code (OAC) 3745-21-11(A)(2), Synthomer is submitting this Reasonably Available Control Technology Analysis (RACT Analysis) to Ohio EPA to evaluate control measures for volatile organic compound (VOC) emissions from existing emissions sources operated at the Facility. This RACT Analysis has been prepared at the request of ARAQMD pursuant to the requirements of OAC 3745-21-11(C) and in accordance with the procedures established in OAC 3745-21-11(B).

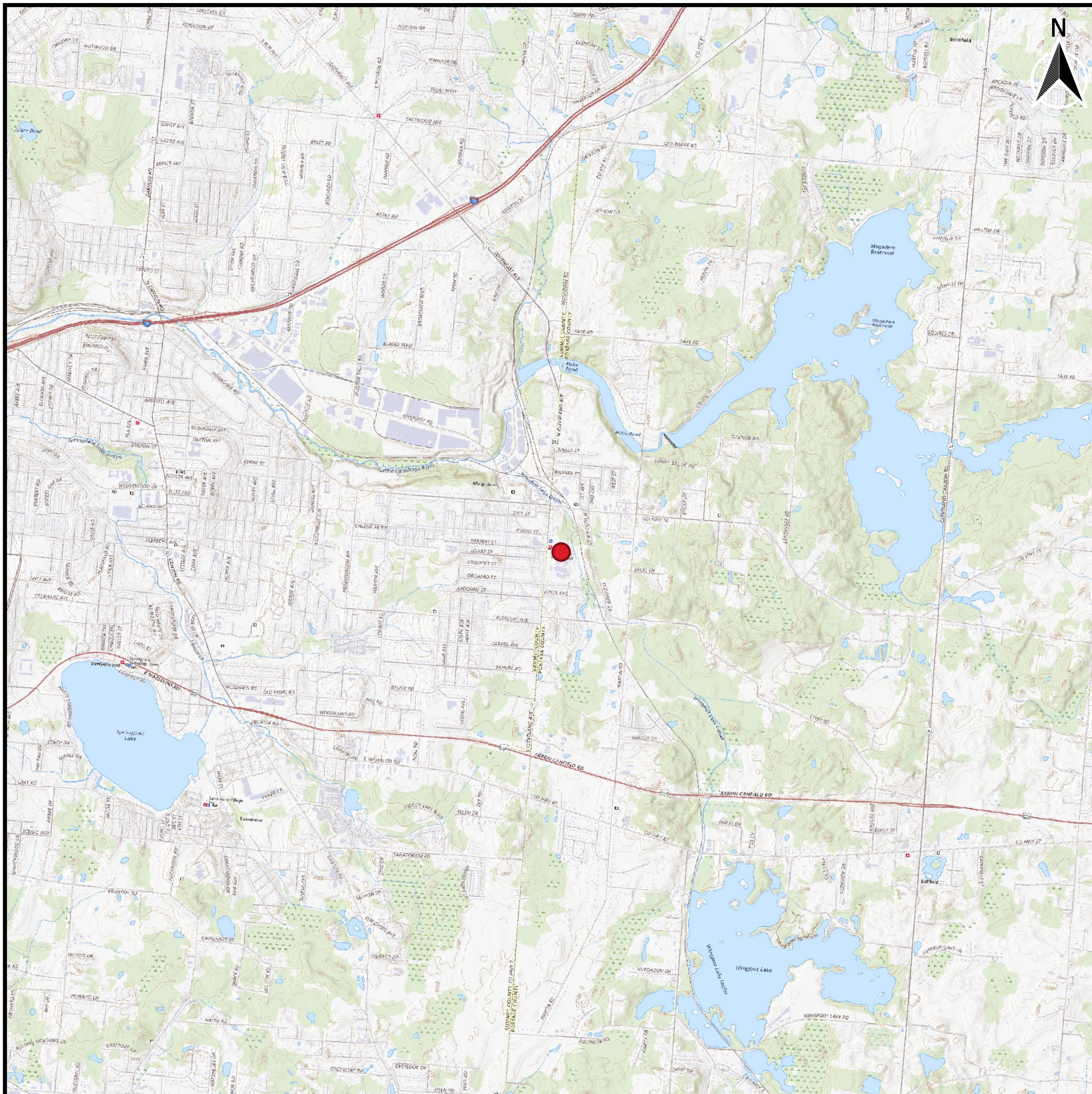
1.1 FACILITY DESCRIPTION

The Facility is located in Summit County, OH east of the city of Akron in the town of Mogadore. A facility location map is presented as Figure 1-1 and a Facility plot plan is provided in Appendix B. The Facility is classified as a synthetic polymer manufacturing operation under Standard Industrial Classification (SIC) code 2821-05. The Facility manufactures synthetic polymer resins and the primary raw materials used in the manufacturing process include styrene, 1,3-butadiene, acrylonitrile, acrylic acid, latex, and other organic compounds (OC). The Facility's VOC emissions consist primarily of evaporative losses and fugitive leaks from the raw materials used in the manufacturing processes and combustion of fuels in the Facility's various combustion units such as boilers and engines. As a synthetic polymer manufacturing operation, emissions control technologies and methods for affected sources operated at the Facility are characterized under United States Environmental Protection Agency (U.S. EPA) Control Technique Guideline (CTG) document EPA-450/3-83-008 developed for control of point-source emissions[1] and U.S.

[1] U.S. EPA Control Technique Guideline, EPA-450/3-83-008. Control of Volatile Organic Compound Emissions from Manufacture of High Density Polyethylene, Polypropylene, and Polystyrene Resins. U.S. EPA Office of Air, Noise, and Radiation – Office of Air Quality Planning and Standards. November 1983.

EPA CTG document EPA-450/3-83-006 developed for control of fugitive equipment leaks at sources in the synthetic organic chemical manufacturing industry (SOCMI)[2].

[2] U.S. EPA Control Technique Guideline, EPA-450/3-83-006. Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical and Polymer Manufacturing Equipment. U.S. EPA Office of Air, Noise, and Radiation – Office of Air Quality Planning and Standards. March 1984.



Legend

Facility Location

0 1 2 km

Figure 1-1
Facility Location Map

Synthomer Inc. -
Mogadore, OH

DRAWN BY: D.A.B.	CHECKED BY: E.D.
DATE: January 2026	PROJ NO.: 002220-0004.00

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Basemap provided courtesy of the United States Geological Survey.

1.2 PERMITTING BACKGROUND

The requirements for State Major Source Operating Permit Programs (i.e., Title V) are codified at 40 CFR Part 70 and apply to facilities that meet the definition of major stationary source at 40 CFR §70.2, or that are not major sources but are subject to specific regulations established in the Federal New Source Performance Standards (NSPS) under 40 CFR Part 60 or National Emissions Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 63. As of 2025, Summit County is classified as in serious nonattainment with the 2015 8-hour National Ambient Air Quality Standard (NAAQS) for ozone. The major source classifications for VOC emissions are reduced to 50 tons per year (tpy) for ozone nonattainment areas in the State of Ohio. The Facility's potential to emit (PTE) for VOC after the application of emissions controls does not exceed the 50 tpy threshold, the PTE for the remaining criteria pollutants do not exceed 100 tpy, and the PTE for hazardous air pollutants (HAP) does not exceed (and is limited to less than) 10 tpy for individual HAP and 25 tpy for total HAP. Therefore, the Facility is not a major stationary source. However, the Facility is required to operate under a TVOP because it is subject to an applicable regulation that triggers requirements under Part 70. Specifically, the Facility is considered an affected source under the 40 CFR Part 63, Subpart VVVVVV NESHAP for Chemical Manufacturing Area Sources (CMAS Rule) and is subject to operating permit requirements in accordance with 40 CFR §63.11494(e) of the rule, which states the following:

> *Any area source that installed a federally-enforceable control device on an affected CMPU is required to obtain a permit under 40 CFR part 70 or 40 CFR part 71 if the control device on the affected CMPU is necessary to maintain the source's emissions at area source levels.*

The Facility currently operates under TVOP P0129497, and the Facility's emissions units combined under Emissions Unit Group 1 (P004, P013, P014, P106, P110, and P115)[3] listed in Section C., Item 1 of the TVOP are subject to federally-enforceable VOC and HAP emissions limits in accordance with both OAC rule 3745-31-05(D) and the area source status criteria of the CMAS Rule. These emissions limits are also required for the Facility to remain a synthetic minor source of HAP to avoid requirements under the Federal NESHAP rules codified at 40 CFR Part 63, Subparts U, JJJ, and FFFF. An existing regenerative thermal

[3] Emissions units P101 and P103 have been removed from the Facility since the last TVOP renewal was issued by OHIO EPA in 2022.

oxidizer (RTO) control device is operated to control VOC emissions from Emissions Unit Group 1 to maintain the Facility's emissions within these emissions limits.

1.3 RACT RULE DESCRIPTION

The RACT provisions codified in OAC rule 3745-21-11 (Non-CTG RACT Rule) were adopted by the State of Ohio to require that affected facilities evaluate the applicability and feasibility of controlling VOC emissions from non-CTG emissions sources located at stationary sources that that have the potential to emit greater than 50 tons per year (tpy) based on theoretical potential to emit (design capacity or maximum production and 8,760 hours per year) before add-on controls. CTG and non-CTG emissions sources are defined in OAC 3745-21-01. For the purposes of the Non-CTG RACT Rule, a non-CTG emissions source is described as "…all other stationary sources of VOC emissions for which the [U.S. EPA] has not developed a control technique guideline document." RACT is defined at OAC rule 3745-21-01(16) as the "lowest emissions that the source is capable of and that is reasonably available considering technological and economic feasibility."

The Facility's VOC PTE does not exceed 50 tpy after the application of emissions controls. However, ARAQMD has determined that because the existing RTO control device for Emissions Unit Group 1 does not have a sufficient operational restriction [such as a Best Available Technology (BAT) determination established within the past 5 years], it cannot be accounted for in determining the Facility's PTE for RACT applicability. Therefore, ARAQMD has required the Facility to submit a RACT Analysis to demonstrate that the RTO control device represents RACT in accordance with OAC 3745-21-11(C). The RACT Analysis must either demonstrate that each emissions unit will be equipped with a capture system and control device that satisfies RACT requirements, or show that such control is not feasible, based on a technical and/or economic evaluation.

Paragraph B(1) through (7) of the Non-CTG RACT Rule specifies the general information components of a RACT analysis that are required for OHIO EPA to consider the analysis administratively complete. Each component is included in the supporting documentation included in this narrative and/or the appendices of this RACT Analysis. Paragraph B(8) through (18) of the Non-CTG RACT Rule specifies the components of a RACT analysis to complete a case-by-case assessment of the applicable control technologies capable of reducing emissions of a pollutant. It is conducted on a "top-down" basis considering technical feasibility as well as economic, environmental, and energy impacts. Paragraph B(8)(a) through (f) establishes the control measures to be evaluated for each affected emissions unit or source group including, but not limited to, the following:

- *(a) Carbon adsorber (with and without recovery of the organic compounds)*
- *(b) Thermal incinerator (with and without heat recovery)*
- *(c) Catalytic incinerator (with and without heat recovery)*
- *(d) Condenser*
- *(e) Scrubber*
- (f) *Any other such RACT alternatives not listed in paragraph (B)(8) of this rule that may be applicable to an affected source, or as are proposed by the owner or operator.*

Paragraph B(9) through (18) specifies the components of the analysis for each control measure including the following:

(9) For each type of control measure that is determined to be technically feasible, an estimate of the control efficiency that can be achieved.

(10) If coating materials are used in an affected source, a detailed discussion of the technical feasibility of converting to waterborne, high-solids or powder coatings to minimize or eliminate the VOC emissions (statements from several major coating suppliers should be obtained to document the conclusions).

(11) A detailed discussion of the technical feasibility of modifying or replacing the source in order to minimize or eliminate the VOC emissions.

(12) A quantification of the VOC emission reductions that could be achieved, at the production rates for the calendar year, by each control option that is determined to be technically feasible.

(13) For each control option that is determined to be technically feasible, an estimate of the capital cost, annualized cost (including capital and operating costs), and the cost-effectiveness (annual dollars per ton of VOC removed annually).

(14) A comparison and discussion of the advantages and disadvantages of control options that are determined to be technically feasible.

(15) A recommended definition of RACT for the source, including one or more of the following:
- *(a) Enforceable production limitations.*
- *(b) Emissions limitations.*
- *(c) Control efficiencies.*
- *(d) Operating requirements.*

(16) An expeditious schedule for implementing the recommended definition of RACT, including milestones for awarding contracts, initiating construction, completing construction, and performing emissions testing, if necessary, to demonstrate compliance with the approved definition of RACT.

(17) Clean and detailed documentation of all calculations of the VOC emissions, including all assumptions made.

(18) *Capital and operating costs and cost-effectiveness estimates calculated in a manner consistent with the most recent edition of the "United States Environmental Protection Agency Air Pollution Control Cost Manual."*

A checklist of the general information required by paragraphs B(1) through (7) and a summary of RACT applicability for the Facility's emissions units is provided in Appendix A. The requirements of paragraph B(8) through (18) are addressed in Sections 3 and 4 below and comprise the case-by-case RACT analysis for the emissions units under Emissions Unit Group 1 of the TVOP.

1.4 OHIO EPA GUIDANCE

The Ohio EPA policy document dated February 7, 2014: *BAT Requirements for Permits Issued On or After February 7, 2014* (2014 Guidance) provides procedures for the economic and technical feasibility analysis used to determine Best Available Technology (BAT) for non-exempt emissions sources and evaluation of requests for source-specific BAT determinations. For the purposes of this RACT Analysis these procedures have been adopted in the absence of OH EPA guidance on RACT-specific feasibility analyses.

The 2015 Guidance does not define a cost-effectiveness threshold used to determine economic feasibility on a cost per ton of emissions reduced basis ($/ton reduced), and previous internal guidance documents for cost analyses used by the Ohio EPA engineering staff have either been rescinded or removed from public access via the agency's website. Therefore, Synthomer proposes that the $12,000/ton reduced threshold established in the neighboring state of Pennsylvania under the state's 25 Pa. Code §129.114 regulations (RACT III) be used as a basis for this RACT Analysis[4]. This proposed cost effectiveness threshold establishes a baseline below which a control measure determined to be technically feasible may be further

[4] Pennsylvania Department of Environmental Protection (PADEP) VOC RACT cost effectiveness threshold codified at 25 Pa. Code §129.114(i)(1)(1) for alternative RACT proposals where an emissions source cannot meet the presumptive RACT emissions limits without add-on emissions control technology.

evaluated on the basis of its economic impacts to identify RACT for the affected emissions unit. Where individual state regulatory agencies have not established state-specific thresholds, using thresholds from neighboring states may provide a representative substitute because facilities located in the same region of the U.S. may experience similar direct and indirect costs for control device equipment vendor services, construction, energy, and labor associated with installation and operation of add-on control technologies.

2. RACT APPLICABILITY

Synthomer has reviewed the emissions units and processes at the Facility to determine the applicable VOC RACT requirements. The applicability of RACT to the VOC emissions sources at the Facility is discussed in the following sections and summarized in Appendix A.

2.1 EMISSIONS UNITS NOT SUBJECT TO RACT ANALYSIS

The emissions units listed in Table A-2 of Appendix A are not considered further in this RACT Analysis. In accordance with Ohio EPA policy, units that are insignificant under the Title V operating permit program, permit exempt under OAC Chapter 3745-31, and de minimis per OAC rule 3745-15-05 can be excluded from the RACT Analysis because the VOC emissions from these emissions units do not meet the threshold required for case-by-case RACT analysis.

2.2 EMISSIONS UNITS MEETING CATEGORICAL RACT REQUIREMENTS

In accordance with OAC rule 3745-21-01(B)(5), emissions units that meet the definition of the listed source categories may meet the categorical norm for RACT based on U.S. EPA's evaluation of that category. The requirement to evaluate RACT does not apply to an emissions unit located at a VOC emitting facility that meets the RACT requirements for the source category. The emissions units listed in Table A-3 of Appendix A are not subject to a RACT analysis because they meet the categorical RACT requirements established in the CTG rules under OAC rule 3745-21-07 and 3745-21-09 as specified in either existing PTIs and/or as specified in the TVOP in Section B., Item 4 requirements referenced from the CMAS Rule. VOC emissions from these emissions units include evaporative losses from reactors, process vents/hoods, tank vents, product loading operations, cooling towers, and fugitive leaks from pumps, valves, and flanges which are reduced by implementing control measures described in U.S. EPA CTG document EPA-450/3-83-006 and the CMAS Rule.

2.3 EMISSIONS UNITS SUBJECT TO RACT ANALYSIS

Synthomer has prepared a RACT analysis and proposed compliance demonstration for control of the VOC emissions sources listed in Table 2-1 below and in Table A-4 of Appendix A. These are the VOC emissions units identified in Emissions Unit Group 1 of the TVOP and which are controlled by the existing thermal oxidizer. For each emissions unit, the Facility must propose a VOC RACT requirement, an emissions limitation, or both, in accordance with OAC rule 3745-21-11.

Table 2-1
Emissions Sources Subject to RACT Analysis

EU ID	Operations and/or Equipment Description	Applicable Rule or Permit	RACT
P004	Latex and Resin Polymerization & Degassing Process	OAC 3745-21-11(A)(2)	Thermal Oxidation via existing RTO; TVOP Conditions for Emissions Unit Group 1
P013	Pretreatment of process wastewater prior to discharge to the publicly owned treatment works (POTW) - Wastewater Effluent System		
P014	Butadiene distillation column, overhead condenser, reflux drum, reboiler, pumps; vented to an existing Process Combustion Corp Thermal Incinerator		
P106	Pilot Plant in-mold coatings production		
P110	Manufacture of polymers for R&D purposes, and from scale-up and semi-works operations		
P115	Manufacture of polymers for R&D purposes, and from scale-up and semi-works operations		

3. RACT ANALYSIS

A RACT analysis is a case-by-case assessment of the applicable control technologies capable of reducing emissions of a pollutant. In accordance with Ohio EPA guidance, it is conducted with a "top-down" approach considering technical and economical feasibility. For purposes of this report, a “top-down” RACT analysis includes the following five basic steps:

- Step 1: Identify Available Control Technologies
- Step 2: Eliminate Technically Infeasible Options
- Step 3: Rank Remaining Control Technologies by Control Effectiveness
- Step 4: Evaluate Economic Impacts of Technically Feasible Control Technologies
- Step 5: Identify RACT

Each of the emissions sources in Table 2-1 that is subject to a RACT analysis is currently controlled by the Facility’s existing RTO. The following sections present the combined VOC RACT analysis for these controlled emissions sources combined under Emissions Unit Group 1. Supporting tables and documents are provided in Appendix A through E.

3.1 STEP 1 – IDENTIFY AVAILABLE CONTROL TECHNOLOGIES

The first step in the “top-down” RACT process is to identify “available” control options. Available control options are those air pollution control technologies or techniques (including lower-emitting processes and practices) that have the potential for practical application to the emissions unit and specific pollutant, with a focus on technologies that have been demonstrated to achieve the highest levels of control for the pollutant in question, regardless of the source type in which the demonstration has occurred.

Synthomer conducted a search of the U.S. EPA’s RACT/BACT/LAER Clearinghouse database (RBLC) for the Polymer and Resin Production information category (63.000) for control technologies and methods used for similar processes in the past 40 years. Multiple process type numbers under this category returned results for facilities with related processes, including those with VOC control methods or technologies. Table 3-1 presents the control technologies available for VOC emissions reduction from the Facility’s process emissions sources based on the RBLC search results and the RACT analysis requirements of OAC rule 3745-21-11(B)(8). A general description of each technology is included below.

Table 3-1
Summary of Available Control Technologies

Pollutant	Control Technology or Technique	Control Efficiency (%)
VOC	Thermal Oxidation/Incineration	95-99%
	Catalytic Oxidation/Incineration	95-99%
	Absorption/Wet Scrubber	70-99%
	Biofiltration	90-93%
	Carbon Adsorption	80-95%
	Condenser	50-99%
	Good Operating Practices	varies by design
	Modifying or Replacing the Source	varies by design

3.1.1 Thermal Oxidation/Incineration

Thermal oxidation or incineration is the process of oxidizing combustible materials by raising the temperature of the material above its auto-ignition point in the presence of oxygen and maintaining it at high temperature for sufficient time to complete combustion to carbon dioxide (CO_2) and water. A thermal oxidizer supplements combustion air and fuel to the existing exhaust to allow for the oxidation of VOC present in the exhaust stream within the combustion chamber. The VOC control efficiency of an oxidizer is dependent on residence time, combustion temperature, and turbulence in the system. These factors provide the basic design parameters for VOC oxidation systems.[5]

The most common type of thermal oxidizer, an RTO, uses a heat recovery medium (e.g., ceramic) to recover the heat and increase turbulence in the unit. Typical VOC destruction efficiency for RTOs ranges from 95% to 99%.[6] An RTO has a high level of heat integration which is best suited for exhaust streams

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[5] Institute of Clean Air Companies (ICAC) website (http://www.icac.com/?VOC_Controls).
[6] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-021.

with high flow rates and low VOC concentrations. RTOs have been used to efficiently control VOC emissions in exhaust streams with VOC concentrations as low as 100 ppm.

Other types of oxidizers, such as direct-fired thermal oxidizers (DFTO), recuperative thermal oxidizers (Recuperative TO), and catalytic thermal oxidizers (Catalytic TO), are also available technologies for the control of VOC emissions. DFTOs do not use heat recovery. Recuperative TOs use an air-to-air heat exchanger for heat recovery and perform best at VOC inlet concentrations of 1,500-3,000 ppm.[7] Catalytic TOs are best suited for systems with lower flowrates and little variation in the type and concentration of VOC, and they may be used effectively for VOC inlet concentrations as low as 1 ppm or less.[8] For the purposes of this RACT analysis, RTO has been selected as a surrogate for oxidation in general because it is generally the most cost-effective due to its high thermal efficiency.

The use of a thermal oxidizer is a technically feasible and well-established method for reducing VOC emissions in a resin and polymer production process. The styrene in use at the Facility is particularly notable for being an odor-causing compound, and the thermal oxidizer is highly effective at eliminating these odor-causing compounds while converting VOC emissions to CO_2. The high-energy, small-molecule nature of other constituents such as 1,3-butadiene, acrylic acid, and acrylonitrile also makes the VOC emissions in the production process readily combustible. The main technical considerations for thermal oxidation revolve around the specific characteristics of the emissions stream. For optimal feasibility, the system must be correctly sized for the airflow volume and designed to handle the concentration of VOCs. High VOC concentrations (near or above 25% of the Lower Explosive Limit or LEL) can sometimes use a simpler DFTO and may even provide a substantial amount of the heat required for the process, reducing reliance on auxiliary fuel. Conversely, a large volume of air with low VOC concentration often favors the highly energy-efficient RTO due to its superior thermal heat recovery (up to 97%) which minimizes operating costs.

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[7] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-020.
[8] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-018.

3.1.2 Catalytic Oxidation/Incineration

Catalytic oxidation or incineration is an add-on control technology that is commonly used to reduce VOC and/or CO emissions. The catalysts are typically made of a precious metal and operate at temperatures in the range of 650°F to 1,000°F.[9] The catalysts cause excess O_2 to react with VOC and/or carbon monoxide (CO) to form CO_2. VOC destruction efficiency of an oxidation catalyst is dependent upon VOC composition and concentration, operating temperature, oxygen concentration, catalyst characteristics, and space velocity. Space velocity is commonly defined as the volumetric flow of gas entering the catalyst bed chamber divided by the volume of the catalyst bed. The relationship between space velocity and VOC destruction efficiency is strongly influenced by catalyst operating temperature. As space velocity increases, VOC destruction efficiency decreases, and as temperature increases, VOC destruction efficiency increases. The typical VOC control efficiency of catalytic oxidizers is 95% to greater than 99%[10].

The use of a catalytic oxidizer is a technically feasible and often economically advantageous solution for reducing VOC emissions from resin and polymer production processes. However, the technical feasibility is highly dependent on the characteristics of the specific exhaust stream. A primary concern is the potential for catalyst deactivation or "poisoning." Certain contaminants common in polymer production, such as particulates, halogens, sulfur compounds, or silicon-containing materials, can foul or chemically react with the catalyst, reducing its effectiveness and requiring costly replacement or regeneration. Processes in polymer and resin manufacturing can often generate high-volume, low-concentration air streams. In such cases, integrating a concentrator (like a rotary zeolite concentrator) as a pre-treatment step is a highly effective strategy. The concentrator adsorbs the VOCs from the large volume of air and releases them into a much smaller, highly concentrated stream, which is then fed into the catalytic oxidizer. This combined system significantly reduces the size and operating cost of the system while maintaining high destruction efficiency.

[9] Catalytic Oxidizer. *Technology Transfer Network Clearinghouse for Inventories & Emissions Factors.* http://cfpub.epa.gov/oarweb/mkb/contechnique.cfm?ControlID=10

[10] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-018.

3.1.3 Absorption/Wet Scrubber

Removal of VOC from waste gas streams by absorbers (wet scrubbers or wet collectors) is based on the principle of mass transfer of gaseous molecules from the air stream into the scrubbing liquid. Transfer is achieved by a combination of diffusion, physical absorption, and/or chemical reaction. Most scrubbers use water as a medium; however, solvent or chemical media can be used for scrubbing small amounts of non-water-soluble compounds.

Packed-bed, or packed-tower, wet scrubbers consist of a chamber filled with layers of packing material that provide ample surface area for liquid-to-particle contact. The scrubbing liquid flows down through the packed bed, coating the packing material. The gas stream flows through the chamber in the opposite direction of the scrubbing fluid. The typical VOC collection efficiency of packed-bed/packed-tower scrubbers can range from 70% to greater than 99%.[11]

Spray-chamber, or spray-tower, wet scrubbers consist of an empty chamber in which the scrubbing liquid is sprayed down through the chamber where it comes into contact with the waste gas stream. The gas stream flows upwards through the chamber in the opposite direction of the scrubbing fluid. Effective pollutant absorption is dependent upon an appropriate combination of scrubber liquid pressure, and gas flow rate. The typical VOC collection efficiency of spray-chamber/spray-tower scrubbers is 50% to 95%.[12]

3.1.4 Biofiltration

Biofiltration systems employ the processes of adsorption, absorption, and microbial degradation to remove VOC from waste gas streams.[13] The gas stream is transported to the biofilter via process ventilation and distributed evenly across the filter by either a perforated pipe system or a cinder block system. As the air passes through the biofilter, VOC are adsorbed onto particles of organic material, absorbed into water droplets within the filter, and then oxidized by microbes. The contaminated air must be conditioned before it enters the system to reach the optimum levels of moisture and temperature. The pH of the biomass must be kept close to neutral to avoid acidification that could inactivate the

[11] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-015.
[12] U.S. EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-016.
[13] U.S. EPA Using Bioreactors to Control Air Pollution, EPA-456/R-03-003.

microorganisms. The high concentration of oxygen in the gas ensures that the biofilter operates continually under aerobic conditions.

Biological activity oxidizes the pollutants and restores the adsorptive capacity of the biomass, thereby making the process self-regenerating. The products of the oxidation process that are released to the atmosphere are CO_2, water, and odorless compounds. Since oxidation in the biofilter is a biological process rather than chemical oxidation, a variety of dissimilar compounds can be removed simultaneously without generating harmful byproducts or causing secondary pollution. Typical VOC destruction efficiency for such biofiltration systems can be as high as 90-93%.

The use of a biofiltration emissions control device to reduce VOC emissions from a resin and polymer production process is generally considered technologically feasible, especially for low to moderate concentrations and large volume airflows. Research, particularly on styrene removal, shows high removal efficiencies—often exceeding 90%—at certain loading rates, demonstrating the effectiveness of the process for this key pollutant in the resin industry. The technical feasibility relies heavily on maintaining optimal operating conditions within the biofilter, including temperature (typically below 40C to protect the microorganisms), moisture content of the media, pH level, and the supply of essential nutrients. For resin and polymer production emissions, which can sometimes be at elevated temperatures, cooling and humidification of the gas stream may be a required pretreatment step, which adds to the system's complexity. Furthermore, a sufficient acclimation period is necessary for the microbial community to become highly effective at degrading the specific VOCs. Biofiltration offers an alternative to traditional thermal or catalytic oxidation, provided the inlet VOC concentrations and flow rate are within the appropriate design window for a biological system.

3.1.5 Carbon Adsorption

Carbon adsorption (adsporption) lends itself well to the removal of VOC components from concentrated and diluted effluent streams, but its efficiency is highly dependent on the compounds found in the exhaust gas and their associated vapor pressures. Also, the gas stream must be cooled from elevated inlet temperatures down to at least 90°F for effective adsorption. This involves incorporation of a condenser into the system prior to the adsorption beds.

The mechanism behind adsorption control systems is preferential adsorption of organic molecules. During adsorption, organics migrate from the effluent gas to the surface of the solid granules of either activated carbon, zeolite (alumino-silicate crystals), or plastic polymers where they are held through physical attraction. In effluent streams where there are multiple organic compounds present, competing adsorption occurs where a number of organics compete for available adsorption sites on the adsorption media. This lessens the capture efficiency for individual species. In addition, compounds with lower vapor pressures tend to desorb compounds with higher vapor pressures resulting in a lessening of the overall system performance. Therefore, a conservative estimate of the VOC removal efficiency of 80-95% was assumed for this analysis.

Adsorption is technically feasible for controlling VOC emissions from resin and polymer production processes, and proven technology exists. Common constituents such as styrene (an aromatic hydrocarbon) are generally well-suited for adsorption onto high-surface-area materials, particularly activated carbon and certain polymeric resins or zeolites. Styrene, being a larger aromatic molecule, has a high affinity for common adsorbents. The technical challenge and resulting feasibility of adsorption depend on process-specific factors such as the concentration of the VOCs, the presence of moisture (as water can compete for adsorption sites, especially on non-hydrophobic adsorbents), and the desired recovery or destruction method. Adsorption systems are often used for solvent recovery, where the concentrated VOCs are desorbed (regenerated) from the adsorbent using steam, hot gas, or a vacuum, allowing the valuable monomers to be recycled. Alternatively, the concentrated desorbed air stream can be sent to a thermal oxidizer for destruction, making the overall destruction process more efficient than treating the initial, dilute air stream. Given that the resin and polymer production process uses high-value monomers, a solvent recovery configuration often presents the most favorable solution.

3.1.6 Condenser

Cryogenic condensation technology (condenser) is based on lowering the vapor pressure of a component by reducing the temperature of the process stream thus increasing the recovery of the components in the liquid phase. For a condenser in service for reducing VOC emissions, the temperature of the exhaust stream is lowered to a temperature at which the target VOC species vapor pressure is lower than its entering partial pressure. This is known as the saturation point of the gas. Lowering the exhaust gas to a temperature below the saturation point allows the VOC to condense on the surface of the condenser tubes to be collected for recycle or disposal. A refrigerant may be necessary to further decrease the temperature of the exhaust gas and therefore achieve a higher level of recovery of the condensable VOC. Cryogenic condensation is best suited to exhaust streams with low flowrates [below 2,000 standard cubic feet per minute (scfm)] and/or vapor concentrations above 100 ppm.[14]

Three specific components can be attributed to the efficiency of a condenser as a sole add-on control device: the heat capacity and temperature of the inlet exhaust stream, the heat transfer characteristics of the condenser (e.g., heat transfer area, heat transfer coefficient), and the outlet temperature of the exhaust gas exiting the condenser. Condensers are classified as either direct-contact or surface non-contact. Direct-contact condensers involve direct contact between the cooling fluid and the gas (e.g., spray towers). Surface non-contact condensers do not involve direct contact; the cooling fluid passes through tubes and the gas stream flows outside of the tubes. Condensers are considered highly effective control devices in single component systems in which emissions streams have a high percentage of condensable VOC. These systems mean less heat is required to be removed from the exhaust gas to reduce the heat of non-condensable gases and to achieve the required condenser temperature for high levels of recovery. VOC removal efficiencies for condensers can range from 50% to 99%.

A condenser presents a technically feasible option for reducing VOC emissions from a resin and polymer production process, provided the operating conditions are appropriately managed. While condensation allows for the recovery of the collected material (which may be reused or sold), a potential limitation is that extremely low emissions may require a polishing step with a more aggressive technology, such as thermal oxidation or carbon adsorption, as the saturation vapor pressure of the VOCs at the condenser's outlet temperature dictates the minimum achievable emission concentration. The specific technical design must account for several critical factors to ensure effective VOC reduction. The condenser must be sized to handle the total volumetric flow rate of the exhaust gas, and the heat exchange area must be sufficient to achieve the target outlet temperature. For a mixed stream of VOC constituents, the most volatile component will determine the minimum required temperature for a given removal efficiency. Furthermore, the presence of water vapor in the stream can cause freezing or icing on the heat transfer

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[14] Cryogenic Condensation and Recovery of VOCs Using Liquid Nitrogen, April 2000, (http://infohouse.p2ric.org/ref/20/19926/P2_Opportunity_Handbook/11_1.html)

surfaces, which necessitates proper system design (e.g., automated defrost cycles or pre-cooling/drying) to prevent fouling and operational downtime. The recovered condensate will be a mixture of VOCs and potentially other components, requiring post-processing if purity is necessary for reuse.

3.1.7 Good Operating Practices

Given the types of materials used during the activities associated with the process emissions sources, good operating practices include several different work practices that are used to minimize associated VOC emissions, such as proper employee training and standard operating procedures, periodic inspections and evaluations of procedures, monitoring and recordkeeping, and general good housekeeping practices (e.g., proper use of materials, proper storage, and proper disposal, etc.). Such practices ensure that personnel use proper procedures within the Facility in a manner that minimizes the creation of VOC emissions.

3.1.8 Modifying or Replacing the Source

OAC 3745-21-11(B)(11) requires that a RACT analysis provide a detailed discussion of the technical feasibility of modifying or replacing the source in order to minimize or eliminate the VOC emissions. Similar to good operating practices, such modifications or replacements may include changes to the configuration of a source to route gas streams to a control device or material recovery process, or the substitution of low-solvent or low-VOC materials in place of higher-VOC materials. These practices may also include process modifications or equipment upgrades which reduce or minimize fugitive emissions from leaks, spills, or evaporative losses or which reduce material usage by improving the efficiency of a process.

3.2 STEP 2 – ELIMINATE TECHNICALLY INFEASIBLE OPTIONS

In the second step of the RACT analysis, an available control technique listed in Step 1 may be eliminated from further consideration if it is not technically feasible for the specific source under review, based on physical, chemical, or engineering principles demonstrating that technical reasons would preclude the successful use of the control option. In general, a specific technology is technically feasible if it has been demonstrated and operated successfully on the same type of emissions unit under review or is available and applicable to the emissions unit type under review. For reasons described in the following subsections, the control techniques, as noted below, are not technically feasible and have been eliminated from further consideration.

3.2.1 Absorption/Wet Scrubber

The technical feasibility of using absorption or a wet scrubber to reduce VOC emissions containing styrene and 1,3-butadiene in a resin/polymer production process is generally considered limited for achieving high removal efficiencies, especially when dealing with typical low-concentration, high-volume exhaust streams. For styrene, which is only partially soluble in water, a simple water-based scrubber achieves a relatively low removal efficiency, with one U.S. EPA evaluation showing performance never exceeding 55%. Chemical scrubbers using reagents like sodium hypochlorite or hydrogen peroxide can improve removal by chemically oxidizing the VOC, but the efficiency can still be insufficient to meet emissions limitations, and the process generates a contaminated liquid waste stream requiring disposal or treatment. Furthermore, some constituents of the VOC emissions, such as 1,3-butadiene, are gases with a very low boiling point and are also sparingly soluble in water, making physical absorption with water highly inefficient. Due to the limitations of simple absorption for these specific VOCs, other technologies are generally preferred and more technically feasible for high-efficiency emissions reduction in this industry.

3.2.2 Modifying or Replacing the Source

Synthomer has determined that the existing configuration of equipment represents an engineering design that is critical to the Facility's synthetic polymer production process. The existing production process has been designed in such a manner as to reduce material losses and maintain efficiency while meeting product specifications that are determined by Synthomer's customers. Additionally, the Facility has already modified the sources included in Emissions Unit Group 1 to accommodate routing their gas streams to the existing RTO. Further modifications or equipment replacements would not affect the Facility's demonstration of compliance with existing emissions limits and VOC control efficiency requirements established in the TVOP. Therefore, modifying or replacing emissions units is not considered to be a technically feasible option to minimize or eliminate VOC emissions from the Facility's operations in comparison to the existing use of the RTO.

3.3 STEP 3 – RANK REMAINING CONTROL TECHNOLOGIES BY CONTROL EFFECTIVENESS

The third step of a RACT analysis calls for each remaining control technology to be listed in order of its overall control effectiveness for the pollutant being assessed. The most effective control technology (i.e., the control technology with the highest control efficiency that achieves the lowest emissions level) should be ranked at the top of the list. The remaining technologies are then ranked in descending order of control effectiveness with the least effective control alterative at the bottom. The ranking of control technologies in Step 3 determines where to start the "top-down" selection process in Step 4.

Those control technology options determined to be technically feasible under Step 2 have been ranked by control effectiveness in Table 3-2. In general, the U.S. EPA CTG document EPA-450/3-83-006 and the respective U.S. EPA Air Pollution Control Technology Fact Sheet for each control technology have been used as a reference for the rankings provided below. Each of the control technologies have been identified as technically feasible to control VOC emissions from processes in the polymer and resin production industry, and each has been implemented by representative emissions units included in the RBLC search results for the industry sector.

Both thermal oxidation and catalytic oxidation have been given equal ranking because they have almost identical control efficiencies and the methods of operation are highly compatible with the VOC emissions from the polymer and resin production processes. The control technologies have been ranked based on the upper and lower bounds of their control efficiencies, with a higher upper bound being generally ranked higher before considering the overall range of control efficiencies. For example, condensation has been ranked primarily due to its lower bound of 50% control efficiency and the large variation in control efficiency based on controlling multiple component systems where greater variability in chemical constituents may occur.

Table 3-2
Ranking of Technically Feasible VOC Control Technologies

Control Technology Option	Control Efficiency	Ranking
Thermal Oxidation	95-99%	1
Catalytic Incineration	95-99%	1
Biofiltration	90-93%	2
Adsorption	80-95%	3
Condensation	50-99%	4
Good Operating Practices	varies by design	5

3.4 STEP 4 – EVALUATE ECONOMIC IMPACTS OF TECHNICALLY FEASIBLE CONTROL TECHNOLOGIES

In the fourth step of a RACT analysis, the economic impacts arising from each remaining control technology should be considered. Accordingly, after available and technically feasible control options have been ranked in terms of control effectiveness, which occurs in Step 3, the economic feasibility of those technologies should be considered to either confirm that the "top" control technology is appropriate or inappropriate. The "top" control technology option should be established as RACT unless the applicant demonstrates that the economic impacts result in the most stringent technology being not "achievable." If the most stringent technology is eliminated accordingly, then the next most stringent technology is considered, and so on.

Synthomer has chosen to implement the top-ranked control option, thermal oxidation, in addition to good operating practices, for the control of VOC emissions from the Emissions Unit Group 1 sources. Therefore, a detailed analysis of the economic feasibility of other control technologies is not necessary to identify RACT and therefore is not included.

3.5 STEP 5 – IDENTIFY RACT

During the fifth and final step of a RACT analysis, the most effective control technology option not eliminated in Step 4 is deemed RACT for the specific pollutant and emissions unit under review. Based on the technical feasibility determinations provided above, Synthomer has determined that the continued use of the existing RTO and good operating practices is RACT for Emissions Unit Group 1. This determination is further supported by the results of Synthomer's RBLC database search provided in Appendix D which shows that thermal oxidation and incineration in general is the most common VOC add-on emissions control technology that has been implemented over the past 40 years in the polymer and resin production industry. As the most common and highest ranked control measure by control efficiency, Synthomer considers the use of thermal oxidation to be a reasonably available control technology for the control of VOC emissions from Emissions Unit Group 1.

4. COMPLIANCE DEMONSTRATION REQUIREMENTS

In accordance with OAC rule 3745-21-11, once RACT has been established for a specific emissions source, a facility must propose a strategy for demonstrating ongoing compliance with the established RACT requirements. Synthomer proposes that ARAQMD maintain the existing federally-enforceable VOC control efficiency limit of 98% for Emission Unit Group 1. This proposed RACT emissions limit is consistent with the continuous operations of the Facility and the VOC emissions limits established in the TVOP. Synthomer also proposes that ARAQMD keep the existing federally-enforceable work practices and methods of compliance established in the TVOP which can be implemented as part of the Facility's ongoing RACT compliance demonstration.

Synthomer has provided the required emissions data in Appendix A and both monthly VOC actual emissions and PTE calculations in Appendix C in accordance with OAC 3745-21-11(B)(7). The Facility's emissions calculations for Emissions Unit Group 1 reflect post-control emissions rates from the use of the existing RTO which satisfies the requirement to implement RACT control measures in lieu of establishing operational restrictions on the Facility's manufacturing operations. The proposed VOC control efficiency represents a previously established limit that accommodates the variability of the pre-control emissions rates from the production processes. Compliance with this existing RACT emissions limit the Facility's VOC PTE will remain below the Title V major stationary source threshold of 50 tpy.

The emissions calculations in Appendix C include the following:

1. VOC PTE for all relevant emission units presented in the Appendix A applicability tables.
2. The pre-control VOC PTE using a representative emissions factor for Emission Unit Group 1 from emission unit P004 (Latex and Resin Polymerization & Degassing Process) developed from the Facility's 2021 RTO compliance testing report.
3. The post-control VOC PTE using the RTO control efficiency of 98%.
4. Monthly actual VOC emissions for 2023-2025.

Synthomer has presented the existing RACT requirements applicable to each affected emissions unit in Table 4-1. Synthomer also proposes that ARAQMD keep the existing monitoring, recordkeeping, reporting, and testing requirements for Emissions Unit Group 1 as an ongoing RACT compliance demonstration. These requirements are specified in detail in the TVOP under Section C., Item 1, paragraphs (a) through (f), with the exception of Section C., Item 1, paragraph (b)(1)(c) for emissions units P101 and P103 which have been shutdown prior to this RACT Analysis.

Table 4-1
RACT Requirements for Emissions Unit Group 1

Requirement	Detail	TVOP & Regulatory Citation
Emissions Limit	For emissions units P004, P013, P014, P106, P110 and P115, the **thermal oxidizer shall achieve at least 98% overall control efficiency**, by weight, for OC.	Section C., Item 1, paragraph (b)(1)(a); OAC rule 3745-31-05(A)(3) OAC rule 3745-21-11(C)

APPENDIX A - RACT APPLICABILITY SUMMARY

Table A-1
OAC 3745-21-11 RACT Checklist
Synthomer Inc. - Mogadore, OH

RACT Citation	Requirement	Detail [(a)(b)(c)]	Document Reference
OAC 3745-21-11(B)(1)	The complete facility name, Ohio EPA air program facility identification number, and address.	**Facility Name:** Mogadore Plant **Ohio EPA ID:** 1667000007 **Address:** 165 South Cleveland Avenue, Mogadore, OH 44260	--
OAC 3745-21-11(B)(2)	The name, title, address and telephone number of the owner or operator's representative within the company who is the contact person for this facility regarding the engineering study and affected sources.	**Name:** Thomas Garrison **Title:** Environmental Engineering Specialist **Address:** 165 South Cleveland Avenue, Mogadore, OH 44260 **Telephone:** 330-628-6522 ext: 36522 **Email:** thomas.garrison@synthomer.com	--
OAC 3745-21-11(B)(3)	The name, title, address and telephone number of the official who is responsible for approval of the engineering study.	**Name:** Brian Fedor **Title:** Site Manager **Address:** 165 South Cleveland Avenue, Mogadore, OH 44260 **Telephone:** 330-628-6443	--
OAC 3745-21-11(B)(4)	The standard industrial classification code and source classification code numbers which are applicable to the facility's operations.	**SIC Code:** 2821-05; synthetic polymer manufacturing **SCC Code:** 30106201 - Acrylonitrile Styrene Butadiene Resin Production	--
OAC 3745-21-11(B)(5)	The following general information for each affected source: (a) Current Ohio EPA application number.	**OH EPA Application Number:** P0129497	--
OAC 3745-21-11(B)(5)	(b) Company identification and Ohio EPA emissions unit identification number.	**Company Identification:** Omnova Solutions, Inc. dba Synthomer PLC **EU ID:** Emissions Unit Group 1 (P004, P013, P014, ~~P101, P103~~, P106, P110, P115)	Appendix A, Table A-4
OAC 3745-21-11(B)(5)	(c) Source description.	Synthetic polymer resin manufacturing facility	--
OAC 3745-21-11(B)(5)	(d) Month and year installed.	See Case-by-Case RACT Applicability Table	Appendix A, Table A-4
OAC 3745-21-11(B)(5)	(e) Normal operating schedule (hours per day, days per week and weeks per year).	**Hours per day:** 24 **Days per year:** 365 **Weeks per year:** 52	Appendix C

Table A-1
OAC 3745-21-11 RACT Checklist
Synthomer Inc. - Mogadore, OH

RACT Citation	Requirement	Detail [a][b][c]	Document Reference
OAC 3745-21-11(B)(5)	(f) Annual production rates for each of the three full calendar years preceding the submission of a RACT study under this rule.	**2023:** 92,836.45 tons per year (tpy) **2024:** 67,170.44 tpy **2025:** 50,048.27 tpy	--
OAC 3745-21-11(B)(5)	(g) Average and maximum daily production rates for each of the three full calendar years preceding the submission of a RACT study under this rule.	**Average** **2023:** 254.35 ton per day (tpd) **2024:** 184.03 tpd **2025:** 137.12 tpd **Maximum** **2023:** 324.71 tpd **2024:** 243.12 tpd **2025:** 173.37 tpd	--
OAC 3745-21-11(B)(5)	(h) The type of control equipment employed and the date installed.	**Control device:** Process Combustion Corp Thermal Incinerator (RTO) **Date Installed:** 2009	--
OAC 3745-21-11(B)(6)	A plot plan which shows the general layout of the facility and the affected sources.	See RACT Analysis Narrative Figure 1-1 and Appendix B	Section 1.0 Appendix B
OAC 3745-21-11(B)(7)	The following emissions data for each affected source: (a) Average daily VOC emissions (pounds per day of operation) based upon the highest average daily production rate for each of the three full calendar years preceding the submission of a RACT study under this rule or any other year that may be representative of the highest average daily emissions.	**2023:** 7.38 lb/day **2024:** 6.42 lb/day **2025:** 7.07 lb/day **Highest Average (2023-2025):** 7.38 lb/day	Appendix C
OAC 3745-21-11(B)(7)	(b) Maximum daily VOC emissions (pounds per day of operation) based upon the highest maximum daily production rate for each of the three full calendar years preceding the submission of a RACT study under this rule or any year that may be more representative of the highest maximum daily emissions.	**2023:** 8.97 lb/day **2024:** 7.68 lb/day **2025:** 8.56 lb/day **Maximum (2023-2025):** 8.97 lb/day	Appendix C

Table A-1
OAC 3745-21-11 RACT Checklist
Synthomer Inc. - Mogadore, OH

RACT Citation	Requirement	Detail [(a)(b)(c)]	Document Reference
OAC 3745-21-11(B)(7)	(c) Annual VOC emissions (tons per year) based upon the highest annual production rate for each of the three full calendar years preceding the submission of a RACT study under this rule or any year period that may be more representative of the annual production rate.	**2023:** 1.35 tpy **2024:** 1.17 tpy **2025:** 1.29 tpy	Appendix C
OAC 3745-21-11(B)(7)	(d) General composition of the VOC emissions.	synthetic polymer resins which include styrene, 1,3-butadiene, acyrlonitrile, acrylic acid, latex, and other organic compounds (OC)	Appendix C
OAC 3745-21-11(B)(7)	(e) If coating materials are used in the source, the company identification and formulation of each coating [VOC content (pounds per gallon of coating and pounds per gallon of coating, excluding water), water content (per cent by volume), solids content (per cent by volume), and exempt organics content (per cent by volume)].	Not Applicable (N/A)	N/A
OAC 3745-21-11(B)(7)	(f) Composition, density and quantity (pounds per day of operation and tons per year) of any clean-up solvents which were employed during the calendar year.	Not Applicable (N/A)	N/A
OAC 3745-21-11(B)(7)	(g) Documentation of the efficiency of the existing control equipment.	RTO Stack Test Report MW011AS-008887-RT-722 June 22, 2021	Appendix E
OAC 3745-21-11(B)(7)	(h) Documentation of any emissions testing which has been performed.	RTO Stack Test Report MW011AS-008887-RT-722 June 22, 2021	Appendix E

[(a)] Production rate and emissions data provided to satisfy the requirements under OAC 3745-21-11(B)(7) are provided for informational purposes only. The production rate and emissions calculations assume that the Facility operates continuously at 8,760 hours per year. The Facility has an existing VOC emissions rate in lb/hr and tpy under Section C., Item 1, paragraph (b)(1)(a) and Section C., Item 1, paragraph (b)(1)(b) of the TVOP for the existing RTO control device that have been established by the OH EPA in lieu of proposed operating restrictions or RACT emissions limits in this RACT Analysis.
[(b)] Emissions units P101 and P103 have been removed from the Facility.

[(c)] The installation date of the existing thermal oxidizer is documented in PTIO P0101911 for Emissions Unit Group 1 (e.g., P004, P013, P014, P101, P103, P105, P106, P110, and P115).

Table A-2
OAC 3745-21 RACT Rule Applicability Summary - Exempt
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
B014	Boiler 8	North American Atlas Generator (8.4 MMBtu/hr)	Insignificant	Permit Exempt	6/1/1973	OAC 3745-31-03(B)(1)	0.99	0.99	Not Applicable (N/A)
B015	Boiler 9	North American Atlas Generator (8.4 MMBtu/hr)	Insignificant	Permit Exempt	6/1/1973	OAC 3745-31-03(B)(1)			N/A
B016	Boiler 10	North American Atlas Generator (8.4 MMBtu/hr)	Insignificant	Permit Exempt	6/1/1973	OAC 3745-31-03(B)(1)			N/A
B017	Boiler 11	North American Atlas Generator (8.4 MMBtu/hr)	Insignificant	Permit Exempt	6/1/1973	OAC 3745-31-03(B)(1)			N/A
B018	Boiler 12	North American Atlas Generator (8.4 MMBtu/hr)	Insignificant	Permit Exempt	6/1/1973	OAC 3745-31-03(B)(1)			N/A
B019	Boiler #1	Cleaver-Brooks Boiler (12.25 MMBtu/hr)	Insignificant	Permitted - operating	2/19/2007	OAC 3745-31-30	0.87	0.87	N/A
B020	Boiler #2	Cleaver-Brooks Boiler (12.25 MMBtu/hr)	Insignificant	Permitted - operating	4/1/2007	OAC 3745-31-30			N/A
B021	Boiler #4	Cleaver-Brooks Boiler (12.25 MMBtu/hr	Insignificant	Permitted - operating	3/1/2007	OAC 3745-31-30			N/A
B022	Emergency Generator	Onan Electrical Generator (175 kW)	Insignificant	Permitted - operating	6/1/1975	OAC 3745-31-30	4.90E-03	4.90E-03	N/A
F001	Roadways	Facility Roadways and Parking Areas	Insignificant	De minimis	10/1/1952	OAC 3745-31-30	0	0	N/A
N001	Pyrolysis Furnace	Maintenance Pyrolysis Furnace B-39-1-Pyro	Insignificant	Not In Service	8/1/1992	OAC 3745-31-03	0	0	N/A
P017	Haywagon	NLB Corp. 200-HP Hi-Pressure Water Jetting Diesel (230 BHP)	Group 2	De minimis	11/23/1998	OAC 3745-31-05(A)(3)	1.08	1.08	N/A
P018	PP Diesel	Jetstream Hi-Pressure Water Jetting Diesel (110 BHP)	Group 2	De minimis	12/15/2000	OAC 3745-31-05(A)(3)	0.59	0.59	N/A
P019	Clarke Fire Pump Engine	Clarke Fire Pump Engine w/ John Deere 6090 Series Power Tech E Diesel Engine (350 BHP)	Insignificant	De minimis	10/1/2013	OAC 3745-31-05(A)(3)	0.02	0.02	N/A
P023	Maintenance Shop	Pilot Plant Maintenance Shop Sandblaster	Insignificant	De minimis	1/1/1998	OAC 3745-31-03	0	0	N/A
P027	Maintenance Shop	Main Plant Maintenance Shop Grinding Wheels (w/ Cyclone Dust Collector)	Insignificant	De minimis	12/31/1973	OAC 3745-31-03	0	0	N/A
P032	Maintenance Shop	Pilot Plant Maintenance Welding	Insignificant	De minimis	1/1/1998	OAC 3745-31-03	0	0	N/A
P033	Maintenance Shop	Main Plant Maintenance Shop Cut-Off Saw (w/ Cyclone Dust Collector)	Insignificant	De minimis	12/31/1973	OAC 3745-31-03	0	0	N/A
P058	Clarke Fire Pump	Fire Water Pump Clarke Fire Pump Engine John Deere 6068 Series (305 BHP)	Insignificant	Permitted - operating	1/1/2022	OAC 3745-31-03	0.02	0.02	N/A

Table A-3
OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
P022	Butadiene Distillation Column Cooling Tower	Butadiene Distillation Column Cooling Tower	Insignificant	Not In Service	7/1/2000	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P118	Area 43 Cooling Tower	Area 43 Main Plant Cooling Tower (Replaced P021) (9,000 gpm)	Insignificant	De minimis	5/1/2019	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
L004	Main Plant Maintenance Shop Parts Washer	Main Plant Maintenance Shop Parts Washer	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P801	Fugitive Emissions from Equipment	Fugitive Emissions	Insignificant	De minimis	6/1/1974	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
J001	Tank Truck Product Loading Operations	Tank Truck Product Loading Operations	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
J002	Railcar Product Loading Operations	Railcar Product Loading Operations	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P025	Pilot Plant Monomer Room Drum Dispensing	Pilot Plant Monomer Room Drum Dispensing	Insignificant	De minimis	3/1/2000	OAC 3745-21-09 40 CFR Part 63 VVVVVV	1.74E-03	1.74E-03	U.S. EPA CTG document EPA-450/3-83-006
P026	Gel Lab Hood #1	Gel Lab Hood #1	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0.07	0.07	U.S. EPA CTG document EPA-450/3-83-006
P040	Malvern Lab Hood #2	Malvern Lab Hood #2	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0.23	0.23	U.S. EPA CTG document EPA-450/3-83-006
P041	Refractometer Lab Hood	Refractometer Lab Hood	Insignificant	De minimis	12/31/1973	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0.03	0.03	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
P024	Pilot Plant Lab Hood #1	Pilot Plant Lab Hood #1 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P042	Pilot Plant Lab Hood #2	Pilot Plant Lab Hood #2 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P043	Pilot Plant Lab Hood #3	Pilot Plant Lab Hood #3 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P044	Pilot Plant Lab Hood #4	Pilot Plant Lab Hood #4 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P045	Pilot Plant Lab Hood #5	Pilot Plant Lab Hood #5 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P046	Pilot Plant Lab Hood #6	Pilot Plant Lab Hood #6 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV	1.85	1.85	U.S. EPA CTG document EPA-450/3-83-006
P047	Pilot Plant Lab Hood #7	Pilot Plant Lab Hood #7 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P048	Pilot Plant Lab Hood #8	Pilot Plant Lab Hood #8 (1st Floor)	Insignificant	De minimis	1/1/1970	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P049	Pilot Plant Lab Hood #9	Pilot Plant Lab Hood #9 (2nd Floor)	Insignificant	De minimis	1/1/2004	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P050	Pilot Plant Lab Hood #10	Pilot Plant Lab Hood #10 (3rd Floor)	Insignificant	De minimis	1/1/2000	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P051	Pilot Plant Lab Hood #11	Pilot Plant Lab Hood #11 (3rd Floor)	Insignificant	De minimis	1/1/2000	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P117	Polyfox Fume Hood	Polyfox Fume Hood (no emissions)	Trivial	De minimis	1/1/2004	OAC 3745-21-09 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
P020	Pilot Plant 2-Gallon Reactor #1	Pilot Plant 2-Gallon Reactor #1	Insignificant	Permit Exempt	1/1/2007	OAC 3745-21-09 40 CFR Part 63 VVVVVV	5.32E-04	5.32E-04	U.S. EPA CTG document EPA-450/3-83-006
P029	Pilot Plant 2-Gallon Reactor #2	Pilot Plant 2-Gallon Reactor #2	Insignificant	Permit Exempt	1/1/2007	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P030	Pilot Plant 2-Gallon Reactor #3	Pilot Plant 2-Gallon Reactor #3	Insignificant	Permit Exempt	1/1/2007	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P031	Pilot Plant 2-Gallon Reactor #4	Pilot Plant 2-Gallon Reactor #4	Insignificant	Permit Exempt	1/1/2007	OAC 3745-21-09 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P028	Solution Mix Tank 114	Solution Mix Tank 114	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P034	Solution Mix Tank 128	Solution Mix Tank 128	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P035	Solution Mix Tank 123	Solution Mix Tank 123	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P036	Solution Mix Tank 110	Solution Mix Tank 110	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P037	Solution Mix Tank 129	Solution Mix Tank 129	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P038	Solution Mix Tank 141	Solution Mix Tank 141	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P039	Solution Mix Tank 142	Solution Mix Tank 142	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV			U.S. EPA CTG document EPA-450/3-83-006
P052	Catalyst Tank #1	Catalyst Make-up Tank #1	Insignificant	De minimis	3/13/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	5.83E-04	5.83E-04	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
P053	Catalyst Tank #2	Catalyst Make-up Tank #2	Insignificant	De minimis	3/13/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	5.83E-04	5.83E-04	U.S. EPA CTG document EPA-450/3-83-006
P054	Reducer Tank #1	Reducer Make-up Tank #1	Insignificant	De minimis	3/13/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P055	Reducer Tank #2	Reducer Make-up Tank #2	Insignificant	De minimis	3/13/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P056	MET #2	Monomer Emulsion Tank No. T-11-23-01 - MET #2	Insignificant	De minimis	10/24/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
P057	MET #1	Monomer Emulsion Tank No. T-11-13-01 - MET #1	Insignificant	De minimis	10/19/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T001	Tank T-53-1	Butadiene Pressure Storage Tank No. T-53-1	Insignificant	Permit Exempt	9/9/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T002	Tank T-53-2	Butadiene Pressure Storage Tank No. T-53-2	Insignificant	Permit Exempt	9/9/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T003	Tank T-53-3	Butadiene Pressure Storage Tank No. T-53-3	Insignificant	Permit Exempt	9/9/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T004	Tank T-53-4	Butadiene Pressure Storage Tank No. T-53-4	Insignificant	Permit Exempt	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T006	Tank T-53-16	2-Hydroxyethyl Acrylate Storage Tank No. T-53-16	Insignificant	Permit Exempt	2/22/1980	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.49E-04	1.49E-04	U.S. EPA CTG document EPA-450/3-83-006
T007	Tank T-53-8	Styrene Storage Tank No. T-53-8	Insignificant	Permit Exempt	7/1/1960	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.11	0.11	U.S. EPA CTG document EPA-450/3-83-006
T009	Tank 53-10	Mercaptan Storage Tank 53-10	Insignificant	De minimis	3/1/1963	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.20E-04	1.20E-04	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T010	Tank T-53-12	Aqueous Ammonia Pressure Storage Tank No. T-53-12 (formerly T-2052)	Insignificant	Permit Exempt	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T014	Tank 53-20	Styrene Storage Tank T-53-20	Insignificant	rmitted - operat	6/1/1985	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.21	0.21	U.S. EPA CTG document EPA-450/3-83-006
T017	Tank T-53-22	N-Methylolacrylamide (NMA) Storage Tank No. T-53-22 (formerly T-428)	Insignificant	Permit Exempt	8/1/1987	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T018	Condensate Pretreatment Tank No. T-85-1	Condensate Pretreatment Tank No. T-85-1	Insignificant	De minimis	9/1/1992	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.30E-02	2.30E-02	U.S. EPA CTG document EPA-450/3-83-006
T019	Condensate Tank #2	Condensate Pretreatment Tank No. T-85-2	Insignificant	De minimis	9/1/1992	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.30E-02	2.30E-02	U.S. EPA CTG document EPA-450/3-83-006
T020	Tank T-53-31	Acrylonitrile Pressure Storage Tank No. T-53-31	Insignificant	rmitted - operat	10/11/1999	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.8	1.8	U.S. EPA CTG document EPA-450/3-83-006
T025	Tank T-53-38	Methacrylic Acid Storage Tank No. T-53-38	Insignificant	Permit Exempt	7/1/2013	OAC 3745-21-07 40 CFR Part 63 VVVVVV	4.70E-03	4.70E-03	U.S. EPA CTG document EPA-450/3-83-006
T026	PMS Tank #1	para-Methylstyrene Storage Tank No. T-53-215-01	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.02	0.02	U.S. EPA CTG document EPA-450/3-83-006
T027	PMS Tank #2	para-Methylstyrene Storage Tank No. T-53-215-02	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.02	0.02	U.S. EPA CTG document EPA-450/3-83-006
T028	2-EHA Tank #1	2-Ethylhexyl Acrylate Storage Tank No. T-53-185-01	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.57E-03	2.57E-03	U.S. EPA CTG document EPA-450/3-83-006
T029	BA Tank #1	Butyl Acrylate Storage Tank No. T-53-184-01	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.04	0.04	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
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EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T030	IBMA Tank #1	Isobutyl Methacrylate Storage Tank No. T-53-186-01	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.03	0.03	U.S. EPA CTG document EPA-450/3-83-006
T031	MMA Tank #1	Methyl Methacrylate Storage Tank No. T-53-188-01	Insignificant	Permit Exempt	9/19/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.15	0.15	U.S. EPA CTG document EPA-450/3-83-006
T032	Tank T-53-23	Butadiene Pressure Storage Tank No. T-53-23	Insignificant	Permit Exempt	7/18/1986	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T033	Tank T-53-24	Butadiene Pressure Storage Tank No. T-53-24	Insignificant	Permit Exempt	7/18/1986	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T035	Pilot Plant Tank T-201	Pilot Plant Pressurized Ammonia Storage Tank No. T-201	Insignificant	Permit Exempt	1/1/1998	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T036	Pilot Plant Tank T-303	Pilot Plant Pressurized Acrylonitrile Storage Tank No. T-303	Insignificant	Permit Exempt	1/1/1998	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T037	Pilot Plant Tank T-301	Pilot Plant Pressurized Butadiene Storage Tank No. T-301	Insignificant	Permit Exempt	1/1/2008	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T038	Product Storage Tank #1	Product Storage Tank #1 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T039	Product Storage Tank #2	Product Storage Tank #2 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T040	Product Storage Tank #3	Product Storage Tank #3 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T041	Product Storage Tank #4	Product Storage Tank #4 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T042	Product Storage Tank #5	Product Storage Tank #5 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006

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EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T043	Product Storage Tank #6	Product Storage Tank #6 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T044	Product Storage Tank #7	Product Storage Tank #7 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T045	Product Storage Tank #8	Product Storage Tank #8 (150,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.30E-04	7.30E-04	U.S. EPA CTG document EPA-450/3-83-006
T046	Product Storage Tank #9	Product Storage Tank #9 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T047	Product Storage Tank #10	Product Storage Tank #10 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T048	Product Storage Tank #11	Product Storage Tank #11 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T049	Product Storage Tank #12	Product Storage Tank #12 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T050	Product Storage Tank #13	Product Storage Tank #13 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T051	Product Storage Tank #30	Product Storage Tank #30 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T052	Product Storage Tank #31	Product Storage Tank #31 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T053	Product Storage Tank #32	Product Storage Tank #32 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T054	Product Storage Tank #33	Product Storage Tank #33 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006

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OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
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EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T055	Product Storage Tank #34	Product Storage Tank #34 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T056	Product Storage Tank #35	Product Storage Tank #35 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T057	Product Storage Tank #36	Product Storage Tank #36 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T058	Product Storage Tank #37	Product Storage Tank #37 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T059	Product Storage Tank #38	Product Storage Tank #38 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T060	Product Storage Tank #39	Product Storage Tank #39 (50,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T061	Product Storage Tank #52	Product Storage Tank #52 (25,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.20E-04	1.20E-04	U.S. EPA CTG document EPA-450/3-83-006
T062	Product Storage Tank #53	Product Storage Tank #53 (25,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.20E-04	1.20E-04	U.S. EPA CTG document EPA-450/3-83-006
T063	Product Storage Tank #54	Product Storage Tank #54 (16,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.80E-05	7.80E-05	U.S. EPA CTG document EPA-450/3-83-006
T064	Product Storage Tank #55	Product Storage Tank #55 (16,000 Gallons)	Insignificant	De minimis	12/31/1973	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.80E-05	7.80E-05	U.S. EPA CTG document EPA-450/3-83-006
T065	Product Storage Tank #60	Product Storage Tank #60 (50,000 Gallons)	Insignificant	De minimis	2/1/1987	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T066	Product Storage Tank #61	Product Storage Tank #61 (50,000 Gallons)	Insignificant	De minimis	2/1/1987	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006

Table A-3
OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T067	Product Storage Tank #62	Product Storage Tank #62 (50,000 Gallons)	Insignificant	De minimis	2/1/1987	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T068	Product Storage Tank #63	Product Storage Tank #63 (50,000 Gallons)	Insignificant	De minimis	2/1/1987	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-04	2.40E-04	U.S. EPA CTG document EPA-450/3-83-006
T069	Product Storage Tank #64	Product Storage Tank #64 (75,000 Gallons)	Insignificant	De minimis	1/1/1992	OAC 3745-21-07 40 CFR Part 63 VVVVVV	3.70E-04	3.70E-04	U.S. EPA CTG document EPA-450/3-83-006
T070	Letdown Tank #1	Liquid Resin Letdown Tank No. T-11-2	Insignificant	De minimis	2/20/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.80E-02	1.80E-02	U.S. EPA CTG document EPA-450/3-83-006
T071	Letdown Tank #2	Liquid Resin Letdown Tank No. T-11-34	Insignificant	De minimis	2/20/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.80E-02	1.80E-02	U.S. EPA CTG document EPA-450/3-83-006
T072	Glycol Tank #1	Chiller Glycol Storage Tank No. T-74-230-01	Insignificant	Permit Exempt	9/12/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-07	2.40E-07	U.S. EPA CTG document EPA-450/3-83-006
T073	Glycol Tank #2	Chiller Glycol Storage Tank No. T-74-230-02	Insignificant	Permit Exempt	9/12/2014	OAC 3745-21-07 40 CFR Part 63 VVVVVV	2.40E-07	2.40E-07	U.S. EPA CTG document EPA-450/3-83-006
T074	Finishing Tank #1	HPP Finishing Tank No. T-13-71	Insignificant	Permit Exempt	3/23/2012	OAC 3745-21-07 40 CFR Part 63 VVVVVV	4.10E-04	4.10E-04	U.S. EPA CTG document EPA-450/3-83-006
T075	Finishing Tank #2	HPP Finishing Tank No. T-13-72	Insignificant	Permit Exempt	3/23/2012	OAC 3745-21-07 40 CFR Part 63 VVVVVV	4.10E-04	4.10E-04	U.S. EPA CTG document EPA-450/3-83-006
T076	Tank V-149	Pilot Plant Styrene Storage Tank V-149	Insignificant	De minimis	6/1/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.01	0.01	U.S. EPA CTG document EPA-450/3-83-006
T077	Tank 53-34	Acrylic Acid Storage Tank 53-34	Insignificant	De minimis	3/1/2007	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.09E-03	7.09E-03	U.S. EPA CTG document EPA-450/3-83-006
T078	Tank 53-35	Acrylic Acid Storage Tank 53-35	Insignificant	De minimis	3/1/2007	OAC 3745-21-07 40 CFR Part 63 VVVVVV	7.09E-03	7.09E-03	U.S. EPA CTG document EPA-450/3-83-006

Table A-3
OAC 3745-21 RACT Rule Applicability Summary - Categorical RACT
Synthomer Inc. - Mogadore, OH

EU ID	Company ID	Equipment Description	TVOP Classification	Status	Install Date	Applicable Rule	Pre-Control VOC Emissions (tpy)	Post-Control VOC Emissions (tpy)	VOC RACT
T079	Filter Feed Tank #1	Liquid Latex Filter Feed Tank No. T-13-224-01	Insignificant	Permit Exempt	5/6/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.30E-03	1.30E-03	U.S. EPA CTG document EPA-450/3-83-006
T080	Filter Feed Tank #2	Liquid Latex Filter Feed Tank No. T-13-224-02	Insignificant	Permit Exempt	5/6/2015	OAC 3745-21-07 40 CFR Part 63 VVVVVV	1.30E-03	1.30E-03	U.S. EPA CTG document EPA-450/3-83-006
T081	Tank T-53-6.1-02	25k gal Styrene Storage Tank T-53-6.1-02	Insignificant	Permit Exempt	5/1/2020	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.11	0.11	U.S. EPA CTG document EPA-450/3-83-006
T082	Tank T-53-6.1-01	35k gal Styrene Storage Tank T-53-6.1-01	Insignificant	Permit Exempt	5/1/2020	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0.08	0.08	U.S. EPA CTG document EPA-450/3-83-006
T083	Tank 11-35	Tank 11-5; 30k gal Latex Product Holding Tank (repurposed from P004 Blowdown Tank 5)	Insignificant	De minimis	10/1/1952	OAC 3745-21-07 40 CFR Part 63 VVVVVV	6.50E-02	6.50E-02	U.S. EPA CTG document EPA-450/3-83-006
T084	Tank T-53-32	Sodium AMPS Bulk Storage Tank No. T-53-32	Trivial	De minimis	6/1/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006
T085	Tank T-1741	Aqueous Solution Bulk Storage Tank No. T-1741	Trivial	De minimis	6/1/1974	OAC 3745-21-07 40 CFR Part 63 VVVVVV	0	0	U.S. EPA CTG document EPA-450/3-83-006

Table A-4
OAC 3745-21 RACT Rule Applicability Summary - RACT Analysis
Synthomer Inc. - Mogadore, OH

<table>
<tr><th>EU ID</th><th>Company ID</th><th>Equipment Description</th><th>TVOP Classification</th><th>Status</th><th>Install Date</th><th>Applicable Rule</th><th>Pre-Control VOC Emissions (tpy)</th><th>Post-Control VOC Emissions (tpy)</th><th>VOC RACT</th></tr>
<tr><td>P004</td><td>Poly/Degas Process</td><td>Latex and Resin Polymerization & Degassing Process</td><td>Group 1</td><td>Permitted - operating</td><td>10/1/1952</td><td>3745-21-11(A)(2)</td><td rowspan="3">385.24</td><td rowspan="6">7.79</td><td rowspan="6">RACT analysis required in accordance with OAC 3745-21-11(C).

Proposed RACT:
98% VOC control efficiency</td></tr>
<tr><td>P013</td><td>Wastewater Effluent System</td><td>Wastewater Pretreatment System</td><td>Group 1</td><td>Permitted - operating</td><td>10/1/1996</td><td>3745-21-11(A)(2)</td></tr>
<tr><td>P014</td><td>BD Distillation Col.</td><td>Butadiene Distillation Column</td><td>Group 1</td><td>Permitted - operating</td><td>5/1/2000</td><td>3745-21-11(A)(2)</td></tr>
<tr><td>P106</td><td>PP In-Mold Coatings</td><td>Pilot Plant In-Mold Coatings Production</td><td>Group 1</td><td>Permitted - operating</td><td>6/1/1966</td><td>3745-21-11(A)(2)</td><td>2.9</td></tr>
<tr><td>P110</td><td>PP Poly #1</td><td>Manufacture of polymers for R&D purposes</td><td>Group 1</td><td>Permitted - operating</td><td>3/1/2000</td><td>3745-21-11(A)(2)</td><td>0.07</td></tr>
<tr><td>P115</td><td>PP Poly #6</td><td>Manufacture of polymers for R&D purposes</td><td>Group 1</td><td>Permitted - operating</td><td>3/1/2000</td><td>3745-21-11(A)(2)</td><td>1.33</td></tr>
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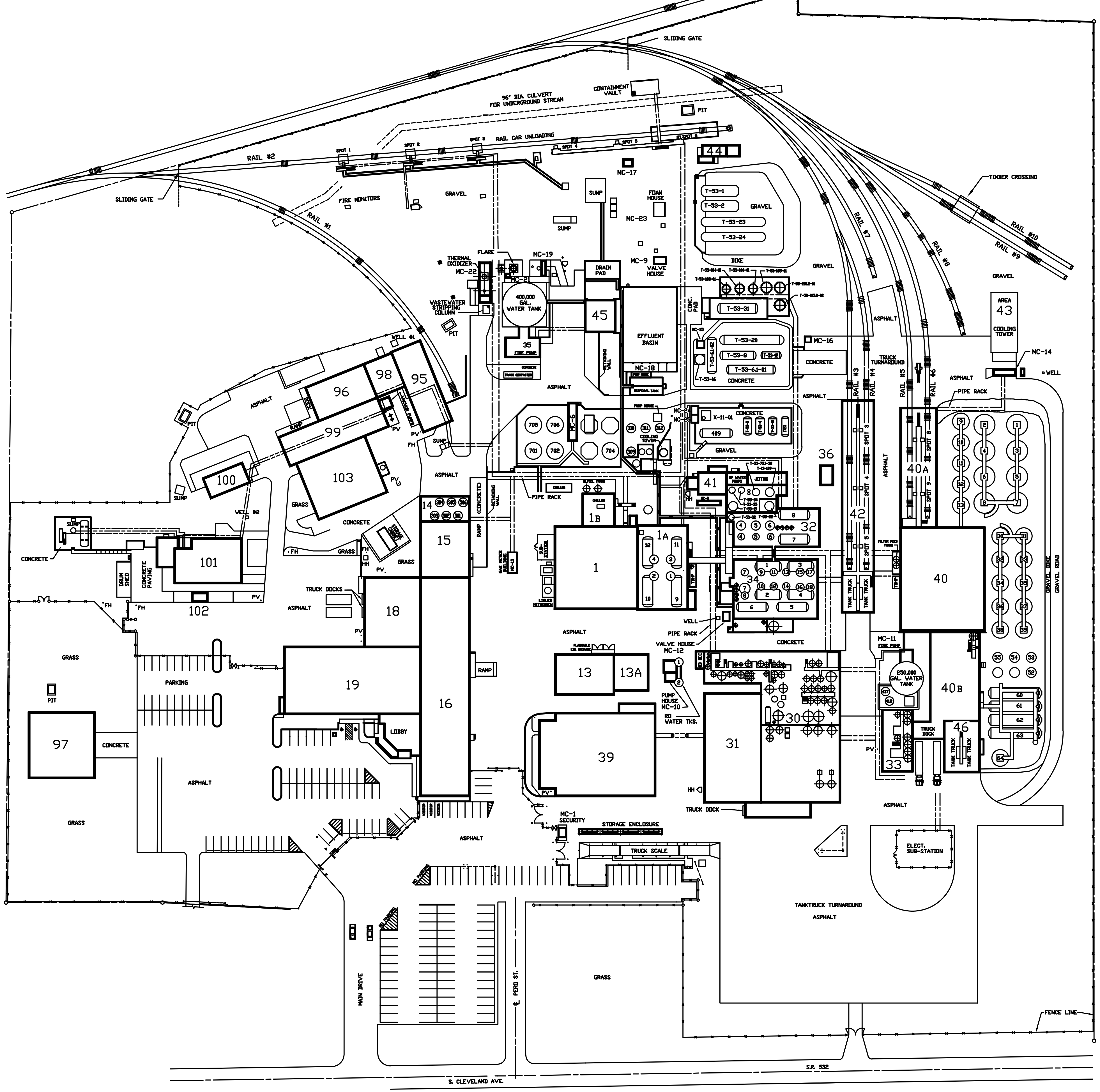
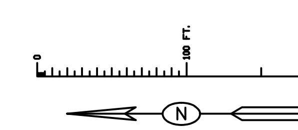
APPENDIX B -
FACILITY PLOT PLAN



LEGEND

BLDG/AREA	DESIGNATION
1	PRODUCTION OFFICES, LUNCHROOM
1A	REACTOR
1B	CHILLER
13	SAFETY
13A	WAREHOUSE ("SUPER MARKET")
14	PROCESS
15	LABORATORY
16	OFFICE & STORAGE
18	STORAGE
19	STORAGE
30	SOLUTIONS
31	BOILER
32	REACTOR
33	PROCESS
34	REACTOR
35	SPRINKLER PUMP HOUSE
36	PUMP HOUSE
39	MAINTENANCE
40	PIECO
40A	LOADING BLDG.
40B	WAREHOUSE
41	VACUUM RECOVERY
42	LOAD/UNLOAD
43	COOLING TOWER AREA
44	BD PUMP HOUSE
45	TREATMENT
46	TANK TRUCK LOADING
95	PILOT PLANT AREAS 1, 2 & 3
96	PROCESS AREA
97	QUONSET HUT
98	PILOT PLANT AREA 4
99	LAB, OFFICE & COAG. AREA
100	HIGH PRESSURE LAB
101	STEREO BLDG.
102	HAZARDOUS MATERIALS BUILDING
103	PILOT PLANT AREA 5
MC-1	GATE HOUSE
MC-6	PUMP HOUSE
MC-8	VALVE HOUSE
MC-9	VALVE HOUSE
MC-10	PUMP HOUSE
MC-11	PUMP HOUSE
MC-12	VALVE HOUSE
MC-13	GAS METER HOUSE
MC-14	VALVE HOUSE
MC-15	CONTROL BLDG.
MC-16	CONTROL BLDG.
MC-17	CONTROL BLDG.
MC-18	PUMP HOUSE
MC-19	PUMP HOUSE
MC-21	INSTRUMENT HOUSE
MC-22	THERMAL OXIDIZER BLDG.
MC-23	FOAM HOUSE
MC-24	PUMP HOUSE
MC-25	INSTRUMENT HOUSE



MOGADORE CHEMICAL PLANT
165 South Cleveland Avenue
Mogadore, OH 44260

MOGADORE SITE PLAN

drawn by: AMS | date: 09/11/97 | scale: AS NOTED | sheet no. D-290 | rev. 05/21/21

APPENDIX C -
EMISSIONS INVENTORY

Table C-1
Facility-Wide Potential Emissions Summary
Synthomer - Mogadore, OH

Source	Source ID	Pre-Control VOC (tpy)	Post-Control VOC (tpy)
Boilers 8-12	B014-B018	0.99	--
Boilers 1 2 4	B019-B021	0.87	--
Emergency Generator	B022	0.00	--
Fire Pumps	B024, P019	0.05	--
Plant Roadways and Parking Lots	F001	0.00	--
Tank Truck Loading	J001	0.00	--
Rail Car Loading	J002	0.00	--
Parts Washers (MEK)	L001, L002	0.00	--
Parts Washers (Shop Parts)	L004	0.00	--
Pyrolysis Furnace	N001	0.00	--
Pressure Washers	P016, P017, P018	1.68	--
Pilot Plant Reactors	P020, P029-P031	5.32E-04	--
Thermal Oxidizer Combustion		0.60	--
Pilot Plant Processes	P101, P103, P106, P110, P115	389.53	7.79
Sandblasting	P023	0.00	--
Grinding	P027	0.00	--
Mix Tank	P028, P034-P039	0.00	--
Welding	P032	0.00	--
Cut Off Saw	P033	0.00	--
Area 43 Cooling Tower	P118	0.00	--
BD Cooling Tower	P022	0.00	--
Pilot Plant Lab Hoods	P024, P042-P051	1.85	--
Monomer Room Drum Dispensing	P025	1.74E-03	--
Gel Lab Hood	P026	0.07	--
Malvern Lab Hood	P040	0.23	--
Refractometer Lab Hood	P041	0.03	--
CHARM Reactor		0.12	--
SB Incremental Reactor		0.02	--
SB Speciality Reactor		0.06	--
Resin Reactor		0.05	--
Semi Continuous Reactor		0.02	--
CMA Reactor		0.00	--
T-11-15-01	P052	5.83E-04	--

Table C-1
Facility-Wide Potential Emissions Summary
Synthomer - Mogadore, OH

Source	Source ID	Pre-Control VOC (tpy)	Post-Control VOC (tpy)
T-11-15-02	P053	5.83E-04	--
T-53-16	T006	1.49E-04	--
T-53-8 (West Styrene)	T007	0.11	--
T-53-10	T009	1.20E-04	--
T-53-20 (East Styrene)	T014	0.21	--
T-53-01	T026	0.02	--
T-53-02	T027	0.02	--
T-53-185	T028	2.57E-03	--
T-53-184	T029	0.04	--
T-53-186	T030	0.03	--
T-53-188-01	T031	0.15	--
Tank V-149 (T-302)	T076	0.01	--
T-53-36	T077	7.09E-03	--
T-53-7	T078	7.09E-03	--
T-53-6.1-01 (South Styrene)	T082	0.11	--
T-53-6.1.02 (North Styrene)	T081	0.08	--
Facility Totals [a]		**396.94**	**15.20**
Threshold		50	50
Less than Major Stationary Source Threshold?		No	Yes

[a] The post-control Facility-wide PTE includes the post-control emissions from the RTO for the Pilot Plant Processes (Emissions Unit Group 1) and all uncontrolled VOC emissions from the other Facility processesses.

Table C-2
Boilers (Emissions Unit IDs B014-B018) PTE
Synthomer - Mogadore, OH

Pollutant	Natural Gas Emissions Factor	Unit	Potential Emissions - Per Boiler [a]		Potential Emissions - Total [a]	
			lb/hr	tpy	lb/hr	tpy
NSR Pollutants [b][c]						
$PM_{TOTAL}/PM_{10}/PM_{2.5}$	7.60	lb/MMscf	0.06	0.27	0.31	1.37
NO_X	100.00	lb/MMscf	0.82	3.61	4.12	18.04
SO_2	0.60	lb/MMscf	0.00	0.02	0.02	0.11
CO	84.00	lb/MMscf	0.69	3.03	3.46	15.15
VOC	5.50	lb/MMscf	0.05	0.20	0.23	0.99
Lead	5.00E-04	lb/MMscf	4.12E-06	1.80E-05	2.06E-05	9.02E-05
CO_2	120,000	lb/MMscf	988	4,328	4,941	21,642
CH_4	2.30	lb/MMscf	0.02	0.08	0.09	0.41
N_2O	2.20	lb/MMscf	0.02	0.08	0.09	0.40
CO_2e	120,713	lb/MMscf	994	4,354	4,971	21,771
Hazardous Air Pollutants (HAP) [d]						
Arsenic	2.00E-04	lb/MMscf	1.65E-06	7.21E-06	8.24E-06	3.61E-05
Benzene	2.10E-03	lb/MMscf	1.73E-05	7.57E-05	8.65E-05	3.79E-04
Cadmium	1.10E-03	lb/MMscf	9.06E-06	3.97E-05	4.53E-05	1.98E-04
Chromium	1.40E-03	lb/MMscf	1.15E-05	5.05E-05	5.76E-05	2.52E-04
Cobalt	8.40E-05	lb/MMscf	6.92E-07	3.03E-06	3.46E-06	1.51E-05
Dichlorobenzene	1.20E-03	lb/MMscf	9.88E-06	4.33E-05	4.94E-05	2.16E-04
Formaldehyde	7.50E-02	lb/MMscf	6.18E-04	2.71E-03	3.09E-03	1.35E-02
Fluoranthene	3.00E-06	lb/MMscf	2.47E-08	1.08E-07	1.24E-07	5.41E-07
Fluorene	2.80E-06	lb/MMscf	2.31E-08	1.01E-07	1.15E-07	5.05E-07
Hexane	1.80	lb/MMscf	1.48E-02	6.49E-02	7.41E-02	3.25E-01
2-Methylnaphthalene	2.40E-05	lb/MMscf	1.98E-07	8.66E-07	9.88E-07	4.33E-06
Manganese	3.80E-04	lb/MMscf	3.13E-06	1.37E-05	1.56E-05	6.85E-05
Mercury	2.60E-04	lb/MMscf	2.14E-06	9.38E-06	1.07E-05	4.69E-05
Naphthalene	6.10E-04	lb/MMscf	5.02E-06	2.20E-05	2.51E-05	1.10E-04
Nickel	2.10E-03	lb/MMscf	1.73E-05	7.57E-05	8.65E-05	3.79E-04
Phenanthrene	1.70E-05	lb/MMscf	1.40E-07	6.13E-07	7.00E-07	3.07E-06
Pyrene	5.00E-06	lb/MMscf	4.12E-08	1.80E-07	2.06E-07	9.02E-07
Toluene	3.40E-03	lb/MMscf	2.80E-05	1.23E-04	1.40E-04	6.13E-04
		Total HAP	0.02	0.07	0.08	0.34

[a] Calculations are based on the following inputs:

Parameter	Value
Fuel Usage (MMBtu/hr) - Per Boiler	8.40
Operating Time (hr/yr) - Per Boiler	8,760
No. of Boilers	5
Avg Natural Gas Heating Value (Btu/scf)	1,020
Conversion (lb/ton)	2,000

[b] Emissions factors come from U.S. EPA AP-42 Tables 1.4-1 and 1.4-2.

[c] CO_2e emissions factor comes from the Global Warming Potentials of CO_2, CH_4, and N_2O listed in 40 CFR Part 98 Table A-1.

[d] Emissions factors come from U.S. EPA AP-42 Tables 1.4-3 and 1.4-4 and include a condensable fraction of PM.

Table C-3
Boilers (Emissions Unit IDs B019-B021) PTE
Synthomer - Mogadore, OH

Pollutant	Natural Gas Emissions Factor	Unit	Potential Emissions - Per Boiler [a]		Potential Emissions - Total [a]	
			lb/hr	tpy	lb/hr	tpy
NSR Pollutants [b][c]						
$PM_{TOTAL}/PM_{10}/PM_{2.5}$	7.60	lb/MMscf	0.09	0.40	0.27	1.20
NO_X	100.00	lb/MMscf	1.20	5.26	3.60	15.78
SO_2	0.60	lb/MMscf	0.01	0.03	0.02	0.09
CO	84.00	lb/MMscf	1.01	4.42	3.03	13.26
VOC	5.50	lb/MMscf	0.07	0.29	0.20	0.87
Lead	5.00E-04	lb/MMscf	6.00E-06	2.63E-05	1.80E-05	7.89E-05
CO_2	120,000	lb/MMscf	1,441	6,312	4,324	18,937
CH_4	2.30	lb/MMscf	0.03	0.12	0.08	0.36
N_2O	2.20	lb/MMscf	0.03	0.12	0.08	0.35
CO_2e	120,713	lb/MMscf	1,450	6,350	4,349	19,050
Hazardous Air Pollutants (HAP) [d]						
Arsenic	2.00E-04	lb/MMscf	2.40E-06	1.05E-05	7.21E-06	3.16E-05
Benzene	2.10E-03	lb/MMscf	2.52E-05	1.10E-04	7.57E-05	3.31E-04
Cadmium	1.10E-03	lb/MMscf	1.32E-05	5.79E-05	3.96E-05	1.74E-04
Chromium	1.40E-03	lb/MMscf	1.68E-05	7.36E-05	5.04E-05	2.21E-04
Cobalt	8.40E-05	lb/MMscf	1.01E-06	4.42E-06	3.03E-06	1.33E-05
Dichlorobenzene	1.20E-03	lb/MMscf	1.44E-05	6.31E-05	4.32E-05	1.89E-04
Formaldehyde	7.50E-02	lb/MMscf	9.01E-04	3.95E-03	2.70E-03	1.18E-02
Fluoranthene	3.00E-06	lb/MMscf	3.60E-08	1.58E-07	1.08E-07	4.73E-07
Fluorene	2.80E-06	lb/MMscf	3.36E-08	1.47E-07	1.01E-07	4.42E-07
Hexane	1.80	lb/MMscf	2.16E-02	9.47E-02	6.49E-02	2.84E-01
2-Methylnaphthalene	2.40E-05	lb/MMscf	2.88E-07	1.26E-06	8.65E-07	3.79E-06
Manganese	3.80E-04	lb/MMscf	4.56E-06	2.00E-05	1.37E-05	6.00E-05
Mercury	2.60E-04	lb/MMscf	3.12E-06	1.37E-05	9.37E-06	4.10E-05
Naphthalene	6.10E-04	lb/MMscf	7.33E-06	3.21E-05	2.20E-05	9.63E-05
Nickel	2.10E-03	lb/MMscf	2.52E-05	1.10E-04	7.57E-05	3.31E-04
Phenanthrene	1.70E-05	lb/MMscf	2.04E-07	8.94E-07	6.13E-07	2.68E-06
Pyrene	5.00E-06	lb/MMscf	6.00E-08	2.63E-07	1.80E-07	7.89E-07
Toluene	3.40E-03	lb/MMscf	4.08E-05	1.79E-04	1.23E-04	5.37E-04
		Total HAP	0.02	0.10	0.07	0.30

[a] Calculations are based on the following inputs:

Parameter	Value
Fuel Usage (MMBtu/hr) - Per Boiler	12.25
Operating Time (hr/yr) - Per Boiler	8,760
No. of Boilers	3
Avg Natural Gas Heating Value (Btu/scf)	1,020
Conversion (lb/ton)	2,000

[b] Emissions factors come from U.S. EPA AP-42 Tables 1.4-1 and 1.4-2.

[c] CO_2e emissions factor comes from the Global Warming Potentials of CO_2, CH_4, and N_2O listed in 40 CFR Part 98 Table A-1.

[d] Emissions factors come from U.S. EPA AP-42 Tables 1.4-3 and 1.4-4 and include a condensable fraction of PM.

Table C-4
Emergency Generator (Emissions Unit ID B022) PTE
Synthomer - Mogadore, OH

Pollutant	Diesel Emissions Factor	Units	Potential Emissions [a]	
			lb/hr	tpy
NSR Pollutants [b]				
PM [c]	2.20E-03	lb/hp-hr	0.52	4.29E-03
PM_{10} [c]	2.20E-03	lb/hp-hr	0.52	4.29E-03
$PM_{2.5}$ [c]	2.20E-03	lb/hp-hr	0.52	4.29E-03
NO_X	3.10E-02	lb/hp-hr	7.27	0.06
SO_X	2.05E-03	lb/hp-hr	0.48	3.99E-03
CO	6.68E-03	lb/hp-hr	1.57	0.01
VOC	2.51E-03	lb/hp-hr	0.59	4.90E-03
CO_2	1.15	lb/hp-hr	269.88	2.24
CH_4	6.62E-03	lb/MMBtu	0.01	9.02E-05
N_2O	1.32E-03	lb/MMBtu	2.17E-03	1.80E-05
CO_2e [d]	1.71	lb/MMBtu	2.81	0.02
Hazardous Air Pollutants (HAP) [b]				
Benzene	9.33E-04	lb/MMBtu	1.53E-03	1.27E-05
Toluene	4.09E-04	lb/MMBtu	6.72E-04	5.58E-06
Xylenes	2.85E-04	lb/MMBtu	4.68E-04	3.89E-06
Propylene	2.58E-03	lb/MMBtu	4.24E-03	3.52E-05
1,3-Butadiene	3.91E-05	lb/MMBtu	6.42E-05	5.33E-07
Formaldehyde	1.18E-03	lb/MMBtu	1.94E-03	1.61E-05
Acetaldehyde	7.67E-04	lb/MMBtu	1.26E-03	1.05E-05
Acrolein	9.25E-05	lb/MMBtu	1.52E-04	1.26E-06
Naphthalene	8.48E-05	lb/MMBtu	1.39E-04	1.16E-06
Acenaphthylene	5.06E-06	lb/MMBtu	8.31E-06	6.90E-08
Acenaphthene	1.42E-06	lb/MMBtu	2.33E-06	1.94E-08
Fluorene	2.92E-05	lb/MMBtu	4.80E-05	3.98E-07
Phenanthrene	2.94E-05	lb/MMBtu	4.83E-05	4.01E-07
Anthracene	1.87E-06	lb/MMBtu	3.07E-06	2.55E-08
Fluoranthene	7.61E-06	lb/MMBtu	1.25E-05	1.04E-07
Pyrene	4.78E-06	lb/MMBtu	7.85E-06	6.52E-08
Benzo(a)anthracene	1.68E-06	lb/MMBtu	2.76E-06	2.29E-08
Chrysene	3.53E-07	lb/MMBtu	5.80E-07	4.81E-09
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	1.63E-07	1.35E-09
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	2.55E-07	2.11E-09
Benzo(a)pyrene	1.88E-07	lb/MMBtu	3.09E-07	2.56E-09
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	6.16E-07	5.11E-09
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	9.58E-07	7.95E-09
Benzo(g,h,l)perylene	4.89E-07	lb/MMBtu	8.03E-07	6.67E-09
		Total HAP	0.01	8.80E-05

[a] Calculations are based on the following inputs:

Parameter	Value
Horsepower (hp)	234.68
Engine Output Rating (kW)	175
Firing Rate (MMBtu/hr)	1.64
Operating Time (hour/yr) [e]	17
Btu/hp-hr	7,000
Conversion (hp/kW)	1.34
Conversion (lb/kg)	2.21
Conversion (lb/ton)	2,000

[b] Emissions factors are from U.S. EPA AP-42 Chapter 3.3 (October 1996), Tables 3.3-1 and 3.3-2.
[c] Emissions calculations conservatively assume $PM=PM_{10}=PM_{2.5}$.
[d] The carbon dioxide equivalent (CO_2e) PTE is based off the following factors from 40 CFR §98 Table A-1 to Subpart A of Part 98 Global Warming Potentials:

Pollutant	Global Warming Potential
CO_2	1
CH_4	25
N_2O	298

[e] The intended operation for the emergency generator is for emergency purposes. 500 hours of operation per year was conservatively assumed to calculate PTE. The actual operations of the fire pump is expected to be less than 500 hours per year.

Table C-5
Fire Pump Engine (Emissions Unit IDs P058 and P019) PTE
Synthomer - Mogadore, OH

Pollutant	Diesel Emissions Factor	Units	Potential Emissions - B058 [a]		Potential Emissions - P019 [a]		Potential Emissions - Total [a]	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
NSR Pollutants [b]								
PM [c]	2.20E-03	lb/hp-hr	0.67	0.02	0.77	0.02	1.44	0.04
PM_{10} [c]	2.20E-03	lb/hp-hr	0.67	0.02	0.77	0.02	1.44	0.04
$PM_{2.5}$ [c]	2.20E-03	lb/hp-hr	0.67	0.02	0.77	0.02	1.44	0.04
NO_X	3.10E-02	lb/hp-hr	9.46	0.27	10.85	0.31	20.31	0.58
SO_X	2.05E-03	lb/hp-hr	0.63	0.02	0.72	0.02	1.34	0.04
CO	6.68E-03	lb/hp-hr	2.04	0.06	2.34	0.07	4.38	0.12
VOC	2.51E-03	lb/hp-hr	0.77	0.02	0.88	0.02	1.65	0.05
CO_2	1.15	lb/hp-hr	350.75	9.94	402.50	11.41	753.25	21.35
CH_4	6.62E-03	lb/MMBtu	0.01	4.00E-04	0.02	4.59E-04	0.03	8.60E-04
N_2O	1.32E-03	lb/MMBtu	2.82E-03	8.01E-05	3.24E-03	9.19E-05	6.07E-03	1.72E-04
CO_2e [d]	1.71	lb/MMBtu	3.65	0.10	4.19	0.12	7.84	0.22
Hazardous Air Pollutants (HAP) [b]								
Benzene	9.33E-04	lb/MMBtu	1.99E-03	5.65E-05	2.29E-03	6.48E-05	4.28E-03	1.21E-04
Toluene	4.09E-04	lb/MMBtu	8.73E-04	2.48E-05	1.00E-03	2.84E-05	1.88E-03	5.32E-05
Xylenes	2.85E-04	lb/MMBtu	6.08E-04	1.73E-05	6.98E-04	1.98E-05	1.31E-03	3.70E-05
Propylene	2.58E-03	lb/MMBtu	5.51E-03	1.56E-04	6.32E-03	1.79E-04	1.18E-02	3.35E-04
1,3-Butadiene	3.91E-05	lb/MMBtu	8.35E-05	2.37E-06	9.58E-05	2.72E-06	1.79E-04	5.08E-06
Formaldehyde	1.18E-03	lb/MMBtu	2.52E-03	7.14E-05	2.89E-03	8.20E-05	5.41E-03	1.53E-04
Acetaldehyde	7.67E-04	lb/MMBtu	1.64E-03	4.64E-05	1.88E-03	5.33E-05	3.52E-03	9.97E-05
Acrolein	9.25E-05	lb/MMBtu	1.97E-04	5.60E-06	2.27E-04	6.42E-06	4.24E-04	1.20E-05
Naphthalene	8.48E-05	lb/MMBtu	1.81E-04	5.13E-06	2.08E-04	5.89E-06	3.89E-04	1.10E-05
Acenaphthylene	5.06E-06	lb/MMBtu	1.08E-05	3.06E-07	1.24E-05	3.51E-07	2.32E-05	6.58E-07
Acenaphthene	1.42E-06	lb/MMBtu	3.03E-06	8.59E-08	3.48E-06	9.86E-08	6.51E-06	1.85E-07
Fluorene	2.92E-05	lb/MMBtu	6.23E-05	1.77E-06	7.15E-05	2.03E-06	1.34E-04	3.80E-06
Phenanthrene	2.94E-05	lb/MMBtu	6.28E-05	1.78E-06	7.20E-05	2.04E-06	1.35E-04	3.82E-06
Anthracene	1.87E-06	lb/MMBtu	3.99E-06	1.13E-07	4.58E-06	1.30E-07	8.57E-06	2.43E-07
Fluoranthene	7.61E-06	lb/MMBtu	1.62E-05	4.61E-07	1.86E-05	5.29E-07	3.49E-05	9.89E-07
Pyrene	4.78E-06	lb/MMBtu	1.02E-05	2.89E-07	1.17E-05	3.32E-07	2.19E-05	6.21E-07
Benzo(a)anthracene	1.68E-06	lb/MMBtu	3.59E-06	1.02E-07	4.12E-06	1.17E-07	7.70E-06	2.18E-07
Chrysene	3.53E-07	lb/MMBtu	7.54E-07	2.14E-08	8.65E-07	2.45E-08	1.62E-06	4.59E-08
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	2.12E-07	6.00E-09	2.43E-07	6.88E-09	4.54E-07	1.29E-08
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	3.31E-07	9.38E-09	3.80E-07	1.08E-08	7.11E-07	2.01E-08
Benzo(a)pyrene	1.88E-07	lb/MMBtu	4.01E-07	1.14E-08	4.61E-07	1.31E-08	8.62E-07	2.44E-08
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	8.01E-07	2.27E-08	9.19E-07	2.60E-08	1.72E-06	4.87E-08
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	1.24E-06	3.53E-08	1.43E-06	4.05E-08	2.67E-06	7.58E-08
Benzo(g,h,l)perylene	4.89E-07	lb/MMBtu	1.04E-06	2.96E-08	1.20E-06	3.40E-08	2.24E-06	6.36E-08
		Total HAP	0.01	3.91E-04	0.02	4.48E-04	0.03	8.39E-04

[a] Calculations are based on the following inputs:

Parameter	Value
P058 Horsepower (hp)	305.00
P058 Firing Rate (MMBtu/hr)	2.14
P019 Engine Horsepower (hp)	350.00
P019 Firing Rate (MMBtu/hr)	2.45
Operating Time (hour/yr) [e]	57
Btu/hp-hr	7,000
Conversion (lb/kg)	2.21
Conversion (lb/ton)	2,000

Combined hours for P058 and P019 for 2023 is 56.7 hours

[b] Emissions factors are from U.S. EPA AP-42 Chapter 3.3 (October 1996), Tables 3.3-1 and 3.3-2.

[c] Emissions calculations conservatively assume $PM=PM_{10}=PM_{2.5}$.

[d] The carbon dioxide equivalent (CO_2e) PTE is based off the following factors from 40 CFR §98 Table A-1 to Subpart A of Part 98 Global Warming Potentials:

Pollutant	Global Warming Potential
CO_2	1
CH_4	25
N_2O	298

[e] The intended operation for the fire pump engine is for emergency purposes. 500 hours of operation per year was conservatively assumed to calculate PTE. The actual operations of the fire pump is expected to be less than 500 hours per year.

Table C-6
Plant Roadways and Parking Lots (Emissions Unit ID F001) PTE
Synthomer - Mogadore, OH

Pollutant	Unpaved emissions [(a)]		Paved emissions [(a)]		Potential Emissions [(a)]	
	Short-term Emissions Factor	Annual Emissions Factor	Short-term Emissions Factor	Annual Emissions Factor		
	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/hr	tpy
PM	0.59	0.35	0.02	0.02	0.53	1.40
PM_{10}	0.15	0.09	4.22E-03	3.80E-03	0.14	0.36
$PM_{2.5}$	0.01	0.01	1.28E-03	1.15E-03	0.01	0.04

[(a)] Calculations are based on the following inputs:

Parameter	Value
Potential Vehicle miles traveled (VMT) - Paved (miles/day)	0.40
Potential VMT - Unpaved (miles/day)	21.65
Day with at least 0.01" precipitation (days)	145
Speed Limit Control Efficiency - 5 mph	80%
Average Vehicle Weight - Unpaved (tons)	4.00
Average Vehicle Weight - Paved (tons)	12.90
Unpaved PM Multiplier, k (lb/VMT)	4.90
Unpaved PM_{10} Multiplier, k (lb/VMT)	1.50
Unpaved $PM_{2.5}$ Multiplier, k (lb/VMT)	0.15
Paved PM Multiplier, k (lb/VMT)	0.01
Paved PM_{10} Multiplier, k (lb/VMT)	2.20E-03
Paved $PM_{2.5}$ Multiplier, k (lb/VMT)	5.40E-04
Empirical Constant - PM, a	0.70
Empirical Constant -PM_{10}/$PM_{2.5}$, a	0.90
Empirical Constant - PM/PM_{10}/$PM_{2.5}$, b	0.45
Unpaved Silt Loading (s)	4.80%
Paved Silt Loading (g/m^2)	0.60
PM/PM_{10} Brake Wear and Tire Wear Factor (lb/VMT)	4.70E-04
$PM_{2.5}$ Brake Wear and Tire Wear Factor (lb/VMT)	3.60E-04
Conversion (lb/ton)	2,000
Operating Hours (hr/yr)	661
Conversion (hr/day)	24
Conversion (day/year)	365

Total truck deliveries for 2023=441 truck deliveries at average 1.5 hours each on site for total of 661.5 hours

[(b)] Emissions calculation methodology is from AP-42 13.2.2 for unpaved roads and AP-42 13.2.1 for paved roads.

Table C-7
Tank Truck Product Loading Operations (Emissions Unit ID J001) PTE
Synthomer - Mogadore, OH

Pollutant	Liquid Mass Fraction	Potential Emissions [a]	
		lb/hr	tpy
2-Ethyl Hexyl Acrylate	0.01%	2.55E-07	8.43E-08
Butyl Acrylate	0.01%	2.55E-07	8.43E-08
Isobutyl Methacrylate	0.01%	2.55E-07	8.43E-08
Methyl Methacrylate	0.01%	2.55E-07	8.43E-08
Para-Methylstyrene	0.01%	2.55E-07	8.43E-08
Styrene	0.01%	2.55E-07	8.43E-08
Total HAP		1.53E-06	5.06E-07

[a] Calculations are based on the following inputs:

Parameter	Value
Maximum VOC Loaded (Mgal/yr)	460,000
E_{VOC} (lb/Mgal)	7.65E-04
Saturation Factor [b]	0.50
Vapor Molecular Weight (lb/lb-mol)	73.25
Vapor Pressure (psia)	9.00E-04
Temperature (Rankine)	537
Conversion (lb/ton)	2,000
Conversion (gal/Mgal)	1,000
Operating Hours (hr/yr)	661
Truck Capacity (gal/truck)	5,000
Time to Load a Truck (hr)	1.5
Trucks at a time (trucks)	1
Maximum Throughput (gal/yr)	2,203,333

Total truck deliveries for 2023=441 truck deliveries at average 1.5 hours each on site for 661 hours run time

[b] Saturation factor is from AP-42 5.2-1 for submerged loading of a clean cargo tank.

Table C-8
Railcar Product Loading Operations (Emissions Unit ID J002) PTE
Synthomer - Mogadore, OH

Pollutant	Liquid Mass Fraction	Potential Emissions [a]	
		lb/hr	tpy
Acrylonitrile	0.01%	6.37E-08	7.80E-08
Butadiene	0.01%	6.37E-08	7.80E-08
Para-Methylstyrene	0.01%	6.37E-08	7.80E-08
Styrene	0.01%	6.37E-08	7.80E-08
	Total HAP	2.55E-07	3.12E-07

[a] Calculations are based on the following inputs:

Parameter	Value
Maximum VOC Loaded (Mgal/yr)	460,000
E_{VOC} (lb/Mgal)	7.65E-04
Saturation Factor [b]	0.50
Vapor Molecular Weight (lb/lb-mol)	73.25
Vapor Pressure (psia)	9.00E-04
Temperature (Rankine)	537
Conversion (lb/ton)	2,000
Conversion (gal/Mgal)	1,000
Operating Hours (hr/yr)	2,448
Conversion (hrs/day)	24
Railcar Capacity (gal/railcar)	20,000
Maximum railcars (railcars/day)	1
Maximum Throughput (gal/yr)	2,040,000

306 railcars delivered material through 2023 with an over estimated unload time of 8 hours

[b] Saturation factor is from AP-42 5.2-1 for submerged loading of a clean cargo tank.

Table C-9
MEK Parts Washer (Emissions Unit IDs L001 and L002) PTE
Synthomer - Mogadore, OH

Parts Washer	VOC Source	VOC Content [b]	Potential Emissions [a]	
			lb/hr	tpy
Building 100 (Maintenance) MEK Parts Washer	Methyl Ethyl Ketone	100%	0.00	0.00
Building 101 (In-Mold Coatings) MEK Parts Washer	Methyl Ethyl Ketone	100%	0.00	0.00
		Total VOC	0.00	0.00

[a] Calculations are based on the following inputs:

Parameter	Value
Maximum Parts Washer Solution Usage (gal/yr)	0
Methyl Ethyl Ketone Density (lb/gal)	6.71
Parts Washer Capacity (gal)	22.00
Number of Parts Washers (Parts Washers)	0.00
Number of Times Solvent is Replaced (times/yr)	0.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	8,760

no longer in service

[b] Assuming 100% Methyl Ethyl Ketone as a conservative approach.

Table C-10
Plant Maintenance Shop Parts Washer (Emissions Unit ID L004) PTE
Synthomer - Mogadore, OH

Pollutant	VOC Content	Potential Emissions [a]	
		lb/hr	tpy
VOC	100%	0.00	0.00
1,2,4-Trimethylbenzene	18%	0.00	0.00
Ethylbenzene	0%	0.00E+00	0.00E+00
Xylenes	3%	0.00E+00	0.00E+00
Cumene	3%	0.00E+00	0.00E+00
	Total HAP	0.00	0.00

[a] Calculations are based on the following inputs:

Parameter	Value
Maximum Parts Washer Solution Usage (gal/yr)	0
Solvent Density (lb/gal)	6.71
Parts Washer Capacity (gal)	22.00
Number of Parts Washers (Parts Washers)	0.00
Number of Times Solvent is Replaced (times/yr)	0.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	8,760

Not in service

Table C-11
Pyrolysis Furnace (Emissions Unit ID N001) PTE
Synthomer - Mogadore, OH

Pollutant	Natural Gas Emissions Factor	Unit	Potential Emissions[a]	
			lb/hr	tpy
NSR Pollutants [b][c]				
$PM_{TOTAL}/PM_{10}/PM_{2.5}$	7.60	lb/MMscf	1.86E-03	0.00E+00
NO_X	94.00	lb/MMscf	0.02	0.00
SO_2	0.60	lb/MMscf	1.47E-04	0.00E+00
CO	40.00	lb/MMscf	0.01	0.00
VOC	5.50	lb/MMscf	1.35E-03	0.00E+00
Lead	5.00E-04	lb/MMscf	1.23E-07	0.00E+00
CO_2	120,000	lb/MMscf	29	0
CH_4	2.30	lb/MMscf	5.64E-04	0.00E+00
N_2O	2.20	lb/MMscf	5.39E-04	0.00E+00
CO_2e	120,713	lb/MMscf	30	0
Hazardous Air Pollutants (HAP) [d]				
Arsenic	2.00E-04	lb/MMscf	4.90E-08	0.00E+00
Benzene	2.10E-03	lb/MMscf	5.15E-07	0.00E+00
Cadmium	1.10E-03	lb/MMscf	2.70E-07	0.00E+00
Chromium	1.40E-03	lb/MMscf	3.43E-07	0.00E+00
Cobalt	8.40E-05	lb/MMscf	2.06E-08	0.00E+00
Dichlorobenzene	1.20E-03	lb/MMscf	2.94E-07	0.00E+00
Formaldehyde	7.50E-02	lb/MMscf	1.84E-05	0.00E+00
Fluoranthene	3.00E-06	lb/MMscf	7.35E-10	0.00E+00
Fluorene	2.80E-06	lb/MMscf	6.86E-10	0.00E+00
Hexane	1.80	lb/MMscf	4.41E-04	0.00E+00
2-Methylnaphthalene	2.40E-05	lb/MMscf	5.88E-09	0.00E+00
Manganese	3.80E-04	lb/MMscf	9.31E-08	0.00E+00
Mercury	2.60E-04	lb/MMscf	6.37E-08	0.00E+00
Naphthalene	6.10E-04	lb/MMscf	1.50E-07	0.00E+00
Nickel	2.10E-03	lb/MMscf	5.15E-07	0.00E+00
Phenanthrene	1.70E-05	lb/MMscf	4.17E-09	0.00E+00
Pyrene	5.00E-06	lb/MMscf	1.23E-09	0.00E+00
Toluene	3.40E-03	lb/MMscf	8.33E-07	0.00E+00
		Total HAP	4.63E-04	0.00E+00

[a] Calculations are based on the following inputs:

Parameter	Value
Fuel Usage (MMBtu/hr)	0.25
Operating Time (hr/yr)	0
No. of Boilers	1
Avg Natural Gas Heating Value (Btu/scf)	1,020
Conversion (lb/ton)	2,000

to be removed from the permit, system has been disconnected and removed

[b] Emissions factors come from U.S. EPA AP-42 Tables 1.4-1 and 1.4-2.

[c] CO_2e emissions factor comes from the Global Warming Potentials of CO_2, CH_4, and N_2O listed in 40 CFR Part 98 Table A-1.

[d] Emissions factors come from U.S. EPA AP-42 Tables 1.4-3 and 1.4-4 and include a condensable fraction of PM.

Table C-12
Pressure Washer Engine (Emissions Unit IDs P017 and P018) PTE
Synthomer - Mogadore, OH

Pollutant	Diesel Emissions Factor	Units	Potential Emissions - P017 [a]		Potential Emissions - P018 [a]		Potential Emissions - Total [a]	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
NSR Pollutants [b]								
PM [c]	2.20E-03	lb/hp-hr	0.44	0.95	0.24	0.52	0.68	1.47
PM_{10} [c]	2.20E-03	lb/hp-hr	0.44	0.95	0.24	0.52	0.68	1.47
$PM_{2.5}$ [c]	2.20E-03	lb/hp-hr	0.44	0.95	0.24	0.52	0.68	1.47
NO_X	3.10E-02	lb/hp-hr	6.20	13.33	3.41	7.33	9.61	20.66
SO_X	2.05E-03	lb/hp-hr	0.41	0.88	0.23	0.48	0.64	1.37
CO	6.68E-03	lb/hp-hr	1.34	2.87	0.73	1.58	2.07	4.45
VOC	2.51E-03	lb/hp-hr	0.50	1.08	0.28	0.59	0.78	1.68
CO_2	1.15	lb/hp-hr	230.00	494.50	126.50	271.98	356.50	766.48
CH_4	6.62E-03	lb/MMBtu	9.26E-03	0.02	5.09E-03	0.01	0.01	0.03
N_2O	1.32E-03	lb/MMBtu	1.85E-03	3.98E-03	1.02E-03	2.19E-03	2.87E-03	0.01
CO_2e [d]	1.71	lb/MMBtu	2.39	5.15	1.32	2.83	3.71	7.98
Hazardous Air Pollutants (HAP) [b]								
Benzene	9.33E-04	lb/MMBtu	1.31E-03	2.81E-03	7.18E-04	1.54E-03	2.02E-03	4.35E-03
Toluene	4.09E-04	lb/MMBtu	5.73E-04	1.23E-03	3.15E-04	6.77E-04	8.88E-04	1.91E-03
Xylenes	2.85E-04	lb/MMBtu	3.99E-04	8.58E-04	2.19E-04	4.72E-04	6.18E-04	1.33E-03
Propylene	2.58E-03	lb/MMBtu	3.61E-03	7.77E-03	1.99E-03	4.27E-03	5.60E-03	1.20E-02
1,3-Butadiene	3.91E-05	lb/MMBtu	5.47E-05	1.18E-04	3.01E-05	6.47E-05	8.48E-05	1.82E-04
Formaldehyde	1.18E-03	lb/MMBtu	1.65E-03	3.55E-03	9.09E-04	1.95E-03	2.56E-03	5.51E-03
Acetaldehyde	7.67E-04	lb/MMBtu	1.07E-03	2.31E-03	5.91E-04	1.27E-03	1.66E-03	3.58E-03
Acrolein	9.25E-05	lb/MMBtu	1.30E-04	2.78E-04	7.12E-05	1.53E-04	2.01E-04	4.32E-04
Naphthalene	8.48E-05	lb/MMBtu	1.19E-04	2.55E-04	6.53E-05	1.40E-04	1.84E-04	3.96E-04
Acenaphthylene	5.06E-06	lb/MMBtu	7.08E-06	1.52E-05	3.90E-06	8.38E-06	1.10E-05	2.36E-05
Acenaphthene	1.42E-06	lb/MMBtu	1.99E-06	4.27E-06	1.09E-06	2.35E-06	3.08E-06	6.63E-06
Fluorene	2.92E-05	lb/MMBtu	4.09E-05	8.79E-05	2.25E-05	4.83E-05	6.34E-05	1.36E-04
Phenanthrene	2.94E-05	lb/MMBtu	4.12E-05	8.85E-05	2.26E-05	4.87E-05	6.38E-05	1.37E-04
Anthracene	1.87E-06	lb/MMBtu	2.62E-06	5.63E-06	1.44E-06	3.10E-06	4.06E-06	8.72E-06
Fluoranthene	7.61E-06	lb/MMBtu	1.07E-05	2.29E-05	5.86E-06	1.26E-05	1.65E-05	3.55E-05
Pyrene	4.78E-06	lb/MMBtu	6.69E-06	1.44E-05	3.68E-06	7.91E-06	1.04E-05	2.23E-05
Benzo(a)anthracene	1.68E-06	lb/MMBtu	2.35E-06	5.06E-06	1.29E-06	2.78E-06	3.65E-06	7.84E-06
Chrysene	3.53E-07	lb/MMBtu	4.94E-07	1.06E-06	2.72E-07	5.84E-07	7.66E-07	1.65E-06
Benzo(b)fluoranthene	9.91E-08	lb/MMBtu	1.39E-07	2.98E-07	7.63E-08	1.64E-07	2.15E-07	4.62E-07
Benzo(k)fluoranthene	1.55E-07	lb/MMBtu	2.17E-07	4.67E-07	1.19E-07	2.57E-07	3.36E-07	7.23E-07
Benzo(a)pyrene	1.88E-07	lb/MMBtu	2.63E-07	5.66E-07	1.45E-07	3.11E-07	4.08E-07	8.77E-07
Indeno(1,2,3-cd)pyrene	3.75E-07	lb/MMBtu	5.25E-07	1.13E-06	2.89E-07	6.21E-07	8.14E-07	1.75E-06
Dibenz(a,h)anthracene	5.83E-07	lb/MMBtu	8.16E-07	1.75E-06	4.49E-07	9.65E-07	1.27E-06	2.72E-06
Benzo(g,h,l)perylene	4.89E-07	lb/MMBtu	6.85E-07	1.47E-06	3.77E-07	8.10E-07	1.06E-06	2.28E-06
		Total HAP	9.04E-03	0.02	4.97E-03	0.01	0.01	0.03

[a] Calculations are based on the following inputs:

Parameter	Value
P016 Horsepower (hp)	0
P016 Firing Rate (MMBtu/hr)	0.00
P017 Horsepower (hp)	200
P017 Firing Rate (MMBtu/hr)	1.40
P018 Engine Horsepower (hp)	110
P018 Firing Rate (MMBtu/hr)	0.77
P016 Operating Time (hour/yr) [e]	4,300
P017 Operating Time (hour/yr) [e]	4,300
P018 Operating Time (hour/yr) [e]	4,300
Btu/hp-hr	7,000
Conversion (lb/kg)	2.21
Conversion (lb/ton)	2,000

[b] Emissions factors are from U.S. EPA AP-42 Chapter 3.3 (October 1996), Tables 3.3-1 and 3.3-2.

[c] Emissions calculations conservatively assume $PM=PM_{10}=PM_{2.5}$.

[d] The carbon dioxide equivalent (CO_2e) PTE is based off the following factors from 40 CFR §98 Table A-1 to Subpart A of Part 98 Global Warming Potentials:

Pollutant	Global Warming Potential
CO_2	1
CH_4	25
N_2O	298

[e] Operational restrictions for pressure washers can be found in Emissions Unit Group - Group 2: P017, P018 (c)(1) of permit P0129497.

Table C-13
Pilot Plant Reactors (Emissions Unit IDs P020 and P029-P031) PTE
Synthomer - Mogadore, OH

Typical SBA Recipe	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
Styrene	Yes	10	99%	80	NA	0.8	0.03	0.15	1.44E-03	6.00E-05	2.63E-04
BD	Yes	8.4	99%	67.2	NA	0.672	0.03	0.12	1.21E-03	5.04E-05	2.21E-04
AN	Yes	2.2	99%	17.6	NA	0.176	7.33E-03	0.03	3.17E-04	1.32E-05	5.78E-05
HEA	No	0.66	99%	5.28	NA	0.0528	2.20E-03	0.01	9.50E-05	3.96E-06	1.73E-05
AA	Yes	0.66	99%	5.28	NA	0.0528	2.20E-03	0.01	9.50E-05	3.96E-06	1.73E-05
IA (7.4%)	No	1.5	99%	12	NA	0.12	5.00E-03	0.02	2.16E-04	9.00E-06	3.94E-05
Sodium Hydroxide	No	0.54	99%	4.32	NA	0.0432	1.80E-03	0.01	7.78E-05	3.24E-06	1.42E-05
Sulfole	Yes	0.43	99%	3.44	NA	0.0344	1.43E-03	0.01	6.19E-05	2.58E-06	1.13E-05
SPS (10%)	No	2.9	99%	23.2	NA	0.232	9.67E-03	0.04	4.18E-04	1.74E-05	7.62E-05
Kathon (4.2%)	No	0.26	99%	2.08	NA	0.0208	8.67E-04	0.00	3.74E-05	1.56E-06	6.83E-06
Drew L198	No	0.033	99%	0.264	NA	0.00264	1.10E-04	0.00	4.75E-06	1.98E-07	8.67E-07
	Total VOC/HAP	**21.69**	**99%**	**173.52**	**0.115**	**1.6202**	**0.07**	**0.30**	**2.92E-03**	**1.22E-04**	**5.32E-04**

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	4
Maximum Potential Production (batches/day)	2.00
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	8,760
Conversion (hr/day)	24

Table C-14
Pilot Plant Processes (Emissions Unit ID P004) Pre-Controlled PTE
Synthomer - Mogadore, OH

Emission Unit ID P004 - Poly/Degas									
Throughput	**Units**	**Reference**	**Charm**	**SB inc**	**SB specialty**	**Resin**	**Semi-con**	**CMA**	**Total**
Average split with addition of CMA	pct	1	57.9%	10.7%	2.0%	19.6%	2.5%	7.2%	100%
Max Production Rate	ton/hr	2	38.09	7.07	1.34	12.87	1.66	4.73	65.77
Max Production Rate	ton/day	2	188.05	34.90	6.62	63.56	8.21	23.38	324.71
Max Production Rate	ton/yr	3	68,637.69	12,739.70	2,415.38	23,198.02	2,995.66	8,532.71	118,519.15
Batch Size - Mean	lb/batch	4	84,892.49	43,344.45	40,632.72	59,622.00	41,105.11	44,373.47	313,970.24
VOC Pre-control Emissions Rate	**lb/hr**		**50.94**	**9.45**	**1.79**	**17.22**	**2.22**	**6.33**	**87.95**
	lb/yr		**446,202.67**	**82,818.74**	**15,702.01**	**150,806.63**	**19,474.29**	**55,469.78**	**770,474.12**
	ton/yr		**223.10**	**41.41**	**7.85**	**75.40**	**9.74**	**27.73**	**385.24**

[1] Percentage split or breakdown of Main plant streams that degas to thermal oxidizer July 2024

[2] Based on max main plant TPD broken into the percentages based off stream

[3] Using TPD for each stream multiplied by 365

[4] Average batch size per stream

[5] Calculating Max batches per year by dividing Max TPY by AVG batch size

[6] Using the amount of VOC charged in a avg batch per stream

[7] VOC post reaction assuming 99% conversion

[8] Max batches multiplied by VOC post reaction/conversion

Operational Information		
VOC Emissions Factor (w/20% safety factor)	lb/ton	1.34
VOC percent losses per batch	pct	1.0%

Conversions		
Pounds per Ton	lb/ton	2,000
Hours per Year	hr/yr	8,760
Days per Year	day/yr	365

The VOC emissions factor is based on the pre-control emissions rated recorded during the Facility's 2021 stack test for P0004.

Table C-15
Pilot Plant Processes (Emissions Unit ID P106, P110, P115) Pre-Controlled PTE
Synthomer - Mogadore, OH

Pilot Plant Production						
Throughput	**Units**	**Reference**	**P106**	**P110**	**P115**	**Total**
Material Distribution (Post 101/103 removal)	pct	1	80.7%	1.1%	18.2%	100%
Max (TPD)	ton/day	2	3.39	0.04	0.76	4.19
Max (TPY)	ton/yr	3	1235.88	16.13	278.98	1530.98
Avg Batch size (lbs)	lb/batch	4	3977.80	160.88	3878.21	8016.89
Max (Batches Per Year)	batch/yr	5	621.39	200.49	143.87	965.74
VOC Pre Reaction per batch (lbs)	lb/batch	6	933.16	69.20	1843.56	2845.92
VOC Pre-control Emissions Rate	lb/yr	7	9.33	0.69	18.44	28.46
VOC Pre-control Emissions Rate	**ton/yr**	**8**	**2.90**	**0.07**	**1.33**	**4.29**

1 Percentage split or breakdown of Pilot plant streams that degas to thermal oxidizer January 2024
2 Based on max Pilot plant TPD broken into the percentages based off stream
3 Using TPD for each stream multiplied by 365
4 Average batch size per stream
5 Calculating Max batches per year by dividing Max TPY by AVG batch size
6 Using the amount of VOC charged in a avg batch per stream
7 VOC post reaction assuming 99% conversion
8 Max batches multiplied by VOC post reaction/conversion

Operational Information		
VOC percent losses per batch	pct	1.0%

Conversions		
Pounds per Ton	lb/ton	2,000
Days per Year	day/yr	365

Table C-16
Pilot Plant Processes (Emissions Unit IDs P004, P013, P014, P101, P103, P106, P110, P115) PTE
Synthomer - Mogadore, OH

Pollutant	Pre-Control Potential Emissions Rates [a]		Control Efficiency	Post-Control Potential Emissions Rates [a]		Permit Emissions limits	
	(lb/hr)	(tpy)	(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
NSR Pollutants [b][c]							
VOC	88.93	389.53	98.0%	1.78	7.79	5.31	23.26
Hazardous Air Pollutants (HAP) [d]							
1,3-Butadiene	23.62	103.44	98.0%	0.47	2.07	1.41	6.18
Styrene	30.31	132.78	98.0%	0.61	2.66	1.81	5.00
Total HAP				1.08	4.72	3.22	11.18

[a] Calculations are based on the following inputs:

Operational Information		
Parameter	**Units**	**Value**
Operating Hours	(hr/yr)	8,760
Pounds per Ton	(lb/ton)	2,000

[b] PM Emissions from in-mold coatings based on engineering estimates.

[c] NO_X, VOC, Styrene, Butadiene emissions factor from permitted hourly mass emissions limits.

Table C-17
Thermal Oxidizer Combustion PTE
Synthomer - Mogadore, OH

Pollutant	Natural Gas Emissions Factor	Unit	Potential Emissions	
			lb/hr	tpy
NSR Pollutants [b][c]				
$PM_{TOTAL}/PM_{10}/PM_{2.5}$	7.60	lb/MMscf	0.19	0.83
NO_X	100.00	lb/MMscf	2.50	10.95
SO_2	0.60	lb/MMscf	0.02	0.07
CO	84.00	lb/MMscf	2.10	9.20
VOC	5.50	lb/MMscf	0.14	0.60
Lead	5.00E-04	lb/MMscf	1.25E-05	5.48E-05
CO_2	120,000	lb/MMscf	3,000	13,140
CH_4	2.30	lb/MMscf	0.06	0.25
N_2O	2.20	lb/MMscf	0.06	0.24
CO_2e	120,713	lb/MMscf	3,018	13,218
Hazardous Air Pollutants (HAP) [d]				
Arsenic	2.00E-04	lb/MMscf	5.00E-06	2.19E-05
Benzene	2.10E-03	lb/MMscf	5.25E-05	2.30E-04
Cadmium	1.10E-03	lb/MMscf	2.75E-05	1.20E-04
Chromium	1.40E-03	lb/MMscf	3.50E-05	1.53E-04
Cobalt	8.40E-05	lb/MMscf	2.10E-06	9.20E-06
Dichlorobenzene	1.20E-03	lb/MMscf	3.00E-05	1.31E-04
Formaldehyde	7.50E-02	lb/MMscf	1.88E-03	8.21E-03
Fluoranthene	3.00E-06	lb/MMscf	7.50E-08	3.29E-07
Fluorene	2.80E-06	lb/MMscf	7.00E-08	3.07E-07
Hexane	1.80	lb/MMscf	4.50E-02	1.97E-01
2-Methylnaphthalene	2.40E-05	lb/MMscf	6.00E-07	2.63E-06
Manganese	3.80E-04	lb/MMscf	9.50E-06	4.16E-05
Mercury	2.60E-04	lb/MMscf	6.50E-06	2.85E-05
Naphthalene	6.10E-04	lb/MMscf	1.53E-05	6.68E-05
Nickel	2.10E-03	lb/MMscf	5.25E-05	2.30E-04
Phenanthrene	1.70E-05	lb/MMscf	4.25E-07	1.86E-06
Pyrene	5.00E-06	lb/MMscf	1.25E-07	5.48E-07
Toluene	3.40E-03	lb/MMscf	8.50E-05	3.72E-04
		Total HAP	0.05	0.21

[a] Calculations are based on the following inputs:

Parameter	Value
Fuel Usage (MMBtu/hr)	25.00
Fuel Usage (MMscf/hr)	0.0250
Operating Time (hr/yr)	8,760
Avg Natural Gas Heating Value (Btu/scf)	1,000
Conversion (lb/ton)	2,000
Conversion (scf/MMscf)	1,000,000

[b] Emissions factors come from U.S. EPA AP-42 Tables 1.4-1 and 1.4-2.
[c] CO_2e emissions factor comes from the Global Warming Potentials of CO_2, CH_4, and N_2O listed in 40 CFR Part 98 Table A-1.
[d] Emissions factors come from U.S. EPA AP-42 Tables 1.4-3 and 1.4-4 and include a condensable fraction of PM.

Table C-18
Sandblasting (Emissions Unit ID P023) PTE
Synthomer - Mogadore, OH

Pollutant	Emissions Factor	Potential Emissions [a]	
	lb/1,000 lb abrasive	lb/hr	tpy
PM	0.69	0.01	5.74E-02
PM_{10}	0.69	0.01	5.74E-02
$PM_{2.5}$	0.69	1.31E-02	5.74E-02

[a] Calculations are based on the following inputs:

Parameter	Value
Throughput (1,000 lb abrasive/yr)	166
Throughput (lbs/hr)	19.0
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	8,760
Conversion (lbs/1,000 lbs)	1,000

Table C-19
Main Plant Maintenance Shop Grinding Wheels (Emissions Unit P027) PTE
Synthomer - Mogadore, OH

Metal surface		Weight	Maximum	Potential Emissions [a]		
in	in^2	lb/ft	Cuts/Day	lb/day	lb/hr	tpy
Channel Iron						
3	1.76	6	20	0.39	0.02	0.07
4	2.13	7.25	10	0.24	0.01	0.04
6	3.81	13	5	0.21	8.89E-03	0.04
8	5.51	18.75	2	0.12	5.13E-03	0.02
Angle Iron						
2x2x1/4	0.94	3.21	12	0.13	5.27E-03	0.02
3x3x1/4	1.44	4.89	8	0.13	5.35E-03	0.02
4x3x3/8	2.86	9.72	4	0.13	5.31E-03	0.02
Steel Pipe						
1	0.49	1.68	10	0.06	2.30E-03	0.01
2	1.07	3.66	8	0.10	4.00E-03	0.02
3	2.23	7.58	4	0.10	4.14E-03	0.02
4	3.17	10.8	2	0.07	2.95E-03	0.01
			Total PM	1.67	0.07	0.31

[a] Calculations are based on the following inputs:

Parameter	Value
Metal removed from grinding (in/cut)	0.03937
Conversion (in/ft)	12
Operating hours (hrs/yr)	8,760
Conversion (lbs/ton)	2,000
Conversion (hr/day)	24

Table C-20
Solution Mix Tank (Emissions Unit IDs P028 and P034-P039) PTE
Synthomer - Mogadore, OH

Raw Material	Cas No.	Make-up Tank ID	Maximum Annual Usage	Potential Emissions [a]	
			lbs/yr	lbs/hr	tpy
Ammonium Persulfate	7727-54-0	114	420,000	0.06	0.25
Ammonium Sulfate	7783-20-2	128	501,429	0.07	0.30
Itaconic Acid	97-65-4	123	1,861,429	0.25	1.12
Potassium Persulfate	7727-21-1	110	140,000	0.02	0.08
Soda Ash	497-19-8	129	14,286	1.96E-03	8.57E-03
Sodium Bicarbonate	144-55-8	141	14,286	1.96E-03	8.57E-03
Sodium Persulfate	7775-27-1	142	1,327,143	0.18	0.80
			Total PM	0.59	2.57

[a] Calculations are based on the following inputs:

Parameter	Value
Metal removed from grinding (in/cut)	0.12%
Operating hours (hr/yr)	8,760
Conversion (lb/ton)	2,000

Table C-21
Maintenance Welding (Emissions Unit IDs P028 and P034-P039) PTE
Synthomer - Mogadore, OH

Pollutant	Emissions Factor	Potential Emissions [a]		
	$lb/10^3$ lb electrode	lb/hr	lb/yr	tpy
PM	81.6	0.07	595.68	0.30
Chromium	25.3	0.02	184.69	0.09
Cobalt	0.01	8.33E-06	0.07	3.65E-05
Manganese	232	0.19	1693.60	0.85
Nickel	17.1	0.01	124.83	0.06
Lead	1.62	1.35E-03	11.83	5.91E-03
Total HAP	26.93	0.02	196.59	0.10

[a] Calculations are based on the following inputs:

Parameter	Value
Daily Maximum Welding Wire Use (lb electrode/day)	20
Maximum Annual Welding (lb electrode/yr)	7,300
Conversion (day/yr)	365
Conversion (hr/yr)	8,760
Conversion (lb/ton)	2,000
Conversion ($lb/10^3$ lb)	1,000

Table C-22
Main Plant Maintenance Shop Cut-Off Saw (Emissions Unit ID P033) PTE
Synthomer - Mogadore, OH

Metal surface		Weight	Maximum	Potential Emissions [a]		
in	in^2	lb/ft	Cuts/Day	lb/day	lb/hr	tpy
Channel Iron						
3	1.76	6	20	1.25	0.05	0.23
4	2.13	7.25	10	0.76	0.03	0.14
6	3.81	13	5	0.68	2.82E-02	0.12
8	5.51	18.75	2	0.39	1.63E-02	0.07
Angle Iron						
2x2x1/4	0.94	3.21	12	0.40	1.67E-02	0.07
3x3x1/4	1.44	4.89	8	0.41	1.70E-02	0.07
4x3x3/8	2.86	9.72	4	0.41	1.69E-02	0.07
Steel Pipe						
1	0.49	1.68	10	0.18	7.29E-03	0.03
2	1.07	3.66	8	0.31	1.27E-02	0.06
3	2.23	7.58	4	0.32	1.32E-02	0.06
4	3.17	10.8	2	0.23	9.38E-03	0.04
			Total PM	5.31	0.22	0.97

[a] Calculations are based on the following inputs:

Parameter	Value
Metal removed per cut (in/cut)	0.125
Conversion (in/ft)	12
Operating hours (hrs/yr)	8,760
Conversion (lbs/ton)	2,000
Conversion (hr/day)	24

Table C-23
Cooling Tower (Emissions Unit ID P021) PTE
Synthomer - Mogadore, OH

Pollutant	Emissions Factor[(a)]	Drift Loss[(b)]	Potential Emissions [(c)]	
	lbs/1,000 gal	%	lb/hr	tpy
$PM_{2.5}$[(d)]	1.70	0.0005	4.59E-03	0.02
PM_{10}	0.019	0.0005	5.13E-05	2.25E-04

[(a)] AP-42 Table 13.4-1 Induced Draft Cooling Towers.

[(b)] Drift loss according to manufacturer specifications.

[(c)] Calculations are based on the following inputs:

Parameter	Value
Water Circulation (gal/min)	9,000
Water Circulation (1,000 gal/hr)	540
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	8,760

[(d)] $PM_{2.5}$ emissions based on total liquid drift.

Table C-24
Cooling Tower (Emissions Unit ID P022) PTE
Synthomer - Mogadore, OH

Pollutant	Emissions Factor[a]	Drift Loss	Potential Emissions [b]	
	lbs/1,000 gal	%	lb/hr	tpy
$PM_{2.5}$[c]	1.70	0.020	1.24E-02	0.05
PM_{10}	0.019	0.020	1.39E-04	6.09E-04

[a] Source: AP-42 Table 13.4-1 Counterflow Induced Draft Cooling Towers.
[b] Calculations are based on the following inputs:

Parameter	Value
Water Circulation (gal/min)	610
Water Circulation (1,000 gal/hr)	37
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	8,760

[c] $PM_{2.5}$ emissions based on total liquid drift.

Table C-25
Pilot Plant Lab Hoods (Emissions Unit IDs P024, P042-P051) PTE
Synthomer - Mogadore, OH

Pollutant	Evaporation Rate	Potential Emissions - per hood [a]		Potential Emissions - total [a]	
	lb/min	lb/hr	tpy	lb/hr	tpy
VOC	0.015	0.92	0.17	10.11	1.85

[a] Calculations are based on the following inputs:

Parameter	Value
Hood face velocity (ft/min)	100
Hexane Molecular Weight (g/mol)	86
Beaker Diameter (in)	3
Number of beakers	18
Exposure Time (hr/day)	1
Wind Speed (m/s)	0.508
Surface Area (ft^2)	0.884
Partial Vapor Pressure (mmHg)	128
Temperature (K)	294
Number of hoods	11
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	365

Table C-26
Monomer Room Drum Dispensing (Emissions Unit ID P025) PTE
Synthomer - Mogadore, OH

Pollutant	Evaporation Rate	Potential Emissions [(a)]	
	lb/min	lb/hr	tpy
VOC	1.59E-04	0.01	1.74E-03

[(a)] Calculations are based on the following inputs:

Parameter	Value
Hood face velocity (ft/min)	50
Vinyl Acetate Molecular Weight (g/mol)	86
Bung (in)	2
Number of Drums	1
Drum Dispensing Time (hr/day)	1
Wind Speed (m/s)	0.254
Surface Area (ft^2)	0.022
Partial Vapor Pressure (mmHg)	92
Temperature (K)	294
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	365

Table C-27
Gel Lab Hood (Emissions Unit ID P026) PTE
Synthomer - Mogadore, OH

Pollutant	Evaporation Rate	Potential Emissions - per hood [a]	
	lb/min	lb/hr	tpy
VOC	0.001	0.03	0.07

[a] Calculations are based on the following inputs:

Parameter	Value
Hood face velocity (ft/min)	140
THF Molecular Weight (g/mol)	72
Bottle Neck Diameter (in)	2
Number of Bottles	2
Exposure Time (hr/day)	12
Wind Speed (m/s)	0.711
Surface Area (ft^2)	0.025
Partial Vapor Pressure (mmHg)	130
Temperature (K)	293
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	365

Table C-28
Malvern Hood (Emissions Unit ID P040) PTE
Synthomer - Mogadore, OH

Pollutant	Evaporation Rate	Potential Emissions - per hood [a]	
	lb/min	lb/hr	tpy
VOC	0.002	0.11	0.23

[a] Calculations are based on the following inputs:

Parameter	Value
Hood face velocity (ft/min)	125
THF Molecular Weight (g/mol)	88
Beaker Diameter (in)	2
Number of beakers	2
Exposure Time (hr/day)	12
Wind Speed (m/s)	0.635
Surface Area (ft^2)	0.025
Partial Vapor Pressure (mmHg)	430
Temperature (K)	293
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	365

Table C-29
Malvern Hood (Emissions Unit P041) PTE
Synthomer - Mogadore, OH

Pollutant	Evaporation Rate	Potential Emissions - per hood [a]	
	lb/min	lb/hr	tpy
VOC	1.91E-04	0.01	0.03

[a] Calculations are based on the following inputs:

Parameter	Value
Hood face velocity (ft/min)	111
Methanol Molecular Weight (g/mol)	32
Beaker Diameter (in)	2
Number of beakers	2
Exposure Time (hr/day)	12
Wind Speed (m/s)	0.564
Surface Area (ft^2)	0.025
Partial Vapor Pressure (mmHg)	100
Temperature (K)	293
Number of hoods	11
Conversion (lb/ton)	2,000
Conversion (min/hr)	60
Operating Time (hr/yr)	365

Table C-30
Tanks PTE
Synthomer - Mogadore, OH

Source ID	Tank Name	Chemical Stored	HAP?	Annual Throughput	VOC Working Loses	VOC Standing Loses	Potential Emissions[a]	
				gal/yr	lb/hr	lb/hr	lb/hr	tpy
P052	T-11-15-01	70% tert-Butyl Hydrogen Peroxide	No	2,055	4.40E-05	8.91E-05	1.33E-04	5.83E-04
P053	T-11-15-02	70% tert-Butyl Hydrogen Peroxide	No	2,055	4.40E-05	8.91E-05	1.33E-04	5.83E-04
T006	T-53-16	2-Hydroxyethyl Acrylate	No	341,832	2.68E-05	7.24E-06	3.41E-05	1.49E-04
T007	T-53-8 (West Styrene)	Styrene	Yes	8,724,410	0.02	1.98E-03	0.02	0.11
T009	T-53-10	tert-Dodecanethiol	No	495,515	2.08E-05	6.67E-06	2.75E-05	1.20E-04
T014	T-53-20 (East Styrene)	Styrene	Yes	18,037,584	0.04	4.26E-03	0.05	0.21
T026	T-53-01	Para Methylstyrene	No	954,000	3.30E-03	8.36E-04	4.13E-03	0.02
T027	T-53-02	Para Methylstyrene	No	954,000	3.30E-03	8.36E-04	4.13E-03	0.02
T028	T-53-185	2-Ethylhexyl Acrylate	No	1,150,200	4.70E-04	1.16E-04	5.86E-04	2.57E-03
T029	T-53-184	Butyl Acrylate	No	693,600	0.01	1.77E-03	9.05E-03	0.04
T030	T-53-186	Isobutyl Methacrylate	No	742,500	5.20E-03	1.25E-03	6.46E-03	0.03
T031	T-53-188-01	Methyl Methacrylate	Yes	476,100	0.03	6.63E-03	0.03	0.15
T076	Tank V-149 (T-302)	Styrene	Yes	88,017	1.24E-03	1.30E-03	2.54E-03	0.01
T077	T-53-36	Acrylic Acid	Yes	347,646	1.33E-03	2.86E-04	1.62E-03	7.09E-03
T078	T-53-7	Acrylic Acid	Yes	347,649	1.33E-03	2.86E-04	1.62E-03	7.09E-03
T082	T-53-6.1-01 (South Styrene)	Styrene	Yes	5,580,000	0.02	3.06E-03	0.03	0.11
T081	T-53-6.1.02 (North Styrene)	Styrene	Yes	5,580,000	0.02	2.17E-03	0.02	0.08
						Total VOC	0.18	0.79
						Total HAP	0.15	0.68

[a] Calculations are based on the following inputs:

Parameter	Value
Conversion (hr/yr)	8,760
Conversion (lb/ton)	2,000

Table C-31
CHARM Reactor PTE
Synthomer - Mogadore, OH

Typical SBA Recipe	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
BD - Butadiene	Yes	18,987	99%	18,987	NA	189.87	7.91	30.38	0.34	0.01	0.05
Dissolvine (Hampene NA3)	No	51	99%	51	NA	0.51	0.02	0.08	9.11E-04	3.80E-05	1.46E-04
Drewplus L-198	No	65	99%	65	NA	0.65	0.03	0.10	1.17E-03	4.86E-05	1.87E-04
Methacrylic Acid (MAA)	Yes	1,630	99%	1,630	NA	16.30	0.68	2.61	0.03	1.22E-03	4.69E-03
Aerosol MA-80 IOS	No	451	99%	451	NA	4.51	0.19	0.72	8.11E-03	3.38E-04	1.30E-03
Sodium Hydroxide	No	2,258	99%	2,258	NA	22.58	0.94	3.61	0.04	1.69E-03	6.50E-03
Sodium Persulfate	No	3,443	99%	3,443	NA	34.43	1.43	5.51	0.06	2.58E-03	9.91E-03
Styrene	Yes	17,533	99%	17,533	NA	175.33	7.31	28.05	0.32	0.01	0.05
AA - Acrylic Acid	Yes	1,931	99%	1,931	NA	19.31	0.80	3.09	0.03	1.45E-03	5.56E-03
IA - Itaconic Acid	No	8,100	99%	8,100	NA	81.00	3.38	12.96	0.15	6.08E-03	0.02
Octolite WL-FG Antioxidant Dispersion	No	150	99%	150	NA	1.50	0.06	0.24	2.70E-03	1.13E-04	4.32E-04
Tertiary Dodecyl Mercaptan	No	243	99%	243	NA	2.43	0.10	0.39	4.37E-03	1.82E-04	7.00E-04
Acticide MBS	No	420	99%	420	NA	4.20	0.18	0.67	7.56E-03	3.15E-04	1.21E-03
Polystep C12 S	No	1,367	99%	1,367	NA	13.67	0.57	2.19	0.02	1.03E-03	3.94E-03
DI Water	No	28,265	99%	28,265	NA	282.65	11.78	45.22	0.51	0.02	0.08
	Total VOC/HAP	40,081	99%	40,081	0.115	400.69	16.70	64.11	0.72	0.03	0.12

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	1
Maximum Potential Production (batches/day)	1.00
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	7,680
Conversion (hr/day)	24

Table C-32
SB Incremental Reactor PTE
Synthomer - Mogadore, OH

Typical SBA Recipe	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
Butadiene	Yes	2,267	99%	2,267	NA	22.67	0.94	3.63	0.04	1.70E-03	6.53E-03
HEA	No	114	99%	114	NA	1.14	0.05	0.18	2.05E-03	8.56E-05	3.29E-04
Sodium Hydroxide	No	622	99%	622	NA	6.22	0.26	0.99	0.01	4.66E-04	1.79E-03
Sodium Persulfate	No	2,516	99%	2,516	NA	25.16	1.05	4.02	0.05	1.89E-03	7.24E-03
Styrene	Yes	5,785	99%	5,785	NA	57.85	2.41	9.26	0.10	4.34E-03	0.02
Tertiary Dodecyl Mercaptan	No	56	99%	56	NA	0.56	0.02	0.09	1.01E-03	4.19E-05	1.61E-04
PAF 9021 CR Starch	No	23,889	99%	23,889	NA	238.89	9.95	38.22	0.43	0.02	0.07
Polystep B-23	No	72	99%	72	NA	0.72	0.03	0.11	1.29E-03	5.38E-05	2.06E-04
ATBS Grade 2407	No	946	99%	946	NA	9.46	0.39	1.51	0.02	7.10E-04	2.72E-03
Preventol P-91-MV	No	129	99%	129	NA	1.29	0.05	0.21	2.32E-03	9.68E-05	3.72E-04
DI Water	No	6,950	99%	6,950	NA	69.50	2.90	11.12	0.13	5.21E-03	0.02
	Total VOC/HAP	8,051	99%	8,051	0.115	80.40	3.35	12.86	0.14	6.03E-03	0.02

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	1
Maximum Potential Production (batches/day)	1
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	7,680
Conversion (hr/day)	24

Table C-33
SB Specality Reactor PTE
Synthomer - Mogadore, OH

Typical SBA Recipe	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
Butadiene	Yes	7,847	99%	7,847	NA	78.47	3.27	12.56	0.14	5.89E-03	0.02
Ammonium Hydroxide	No	57	99%	57	NA	0.57	0.02	0.09	1.03E-03	4.28E-05	1.64E-04
Kathon LX	No	94	99%	94	NA	0.94	0.04	0.15	1.69E-03	7.05E-05	2.71E-04
Dissolvine (Hampene NA3)	No	25	99%	25	NA	0.25	0.01	0.04	4.50E-04	1.88E-05	7.20E-05
Drewplus L-198	No	8	99%	8	NA	0.08	3.33E-03	0.01	1.44E-04	6.00E-06	2.30E-05
Sodium Hydroxide	No	1,185	99%	1,185	NA	11.85	0.49	1.90	0.02	8.89E-04	3.41E-03
Sodium Persulfate	No	2,080	99%	2,080	NA	20.80	0.87	3.33	0.04	1.56E-03	5.99E-03
Styrene	Yes	11,859	99%	11,859	NA	118.59	4.94	18.97	0.21	8.89E-03	0.03
AA - Acrylic Acid	Yes	200	99%	200	NA	2.00	0.08	0.32	3.60E-03	1.50E-04	5.76E-04
Proxel GXL	No	51	99%	51	NA	0.51	0.02	0.08	9.18E-04	3.83E-05	1.47E-04
Itaconic Acid	No	2,629	99%	2,629	NA	26.29	1.10	4.21	0.05	1.97E-03	7.57E-03
Tertiary Dodecyl Mercaptan	No	327	99%	327	NA	3.27	0.14	0.52	5.89E-03	2.45E-04	9.42E-04
Cal-SoftL-40	No	47	99%	47	NA	0.47	0.02	0.08	8.46E-04	3.53E-05	1.35E-04
DI Water	No	18,480	99%	18,480	NA	184.80	7.70	29.57	0.33	0.01	0.05
WR seed tote	No	490	99%	490	NA	4.90	0.20	0.78	8.82E-03	3.68E-04	1.41E-03
	Total VOC/HAP	19,906	99%	19,906	0.115	198.95	8.29	31.83	0.36	0.01	0.06

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	1
Maximum Potential Production (batches/day)	1.00
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	7,680
Conversion (hr/day)	24

Based on HY Draft - 47B40 Lipaton

Table C-34
Resin Reactor PTE
Synthomer - Mogadore, OH

Raw Material	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
Potassium Hydroxide	No	448	99%	448	NA	4.48	0.19	0.72	8.06E-03	3.36E-04	1.29E-03
Potassium Persulfate	No	2,389	99%	2,389	NA	23.89	1.00	3.82	0.04	1.79E-03	6.88E-03
Tertiary Dodecyl Mercaptan	No	9	99%	9	NA	0.09	3.75E-03	0.01	1.62E-04	6.75E-06	2.59E-05
Sodium Sulfate	No	1,889	99%	1,889	NA	18.89	0.79	3.02	0.03	1.42E-03	5.44E-03
2-Ethyl Hexyl Acrylate	No	5,498	99%	5,498	NA	54.98	2.29	8.80	0.10	4.12E-03	0.02
Divinyl Benzene	Yes	32	99%	32	NA	0.32	0.01	0.05	5.76E-04	2.40E-05	9.22E-05
Para-Methyl Styrene	Yes	16,493	99%	16,493	NA	164.93	6.87	26.39	0.30	0.01	0.05
Savon Potassium	No	1,624	99%	1,624	NA	16.24	0.68	2.60	0.03	1.22E-03	4.68E-03
DI Water	No	31,240	99%	31,240	NA	312.40	13.02	49.98	0.56	0.02	0.09
	Total VOC/HAP	16,525	99%	16,525	0.115	165.14	6.88	26.42	0.30	0.01	0.05

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	1
Maximum Potential Production (batches/day)	1.00
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	7,680
Conversion (hr/day)	24

Table C-35
Semi-Continuous Reactor PTE
Synthomer - Mogadore, OH

Typical SBA Recipe	VOC/HAP	lbs/batch	Conversion Rate	lbs/day	Residuals in Product	Uncontrolled Emissions [a]			Controlled Emissions [a]		
						lbs/day	lbs/hr	tpy	lbs/day	lbs/hr	tpy
Methacrylic Acid (MAA)	Yes	367	99%	367	NA	3.67	0.15	0.59	6.61E-03	2.75E-04	1.06E-03
Styrene	Yes	4,959	99%	4,959	NA	49.59	2.07	7.93	0.09	3.72E-03	0.01
Ammonium Persulfate	No	770	99%	770	NA	7.70	0.32	1.23	0.01	5.78E-04	2.22E-03
Butyl Acrylate	Yes	332	99%	332	NA	3.32	0.14	0.53	5.98E-03	2.49E-04	9.56E-04
2-Ethyl Hexyl Acrylate	No	6,758	99%	6,758	NA	67.58	2.82	10.81	0.12	5.07E-03	0.02
DMEA	Yes	244	99%	244	NA	2.44	0.10	0.39	4.38E-03	1.83E-04	7.02E-04
Rhodapex CO 436	No	159	99%	159	NA	1.59	0.07	0.25	2.86E-03	1.19E-04	4.57E-04
HEMA	Yes	1,653	99%	1,653	NA	16.53	0.69	2.65	0.03	1.24E-03	4.76E-03
Igepal CO 430	No	70	99%	70	NA	0.70	0.03	0.11	1.26E-03	5.25E-05	2.02E-04
DI Water	No	25,751	99%	25,751	NA	257.51	10.73	41.20	0.46	0.02	0.07
Antarol L837	No	2	99%	2	NA	0.02	8.61E-04	3.31E-03	3.72E-05	1.55E-06	5.95E-06
Acticide M20S	No	21	99%	21	NA	0.21	8.75E-03	0.03	3.78E-04	1.58E-05	6.05E-05
Acticide MV	No	19	99%	19	NA	0.19	7.88E-03	0.03	3.41E-04	1.42E-05	5.45E-05
	Total VOC/HAP	7,556	99%	7,556	0.115	75.44	3.14	12.07	0.14	5.66E-03	0.02

[a] Calculations are based on the following inputs:

Parameter	Value
Number of Reactors (Reactors)	1
Maximum Potential Production (batches/day)	1.00
Conversion Rate (%)	99%
Thermal Oxidizer Efficiency	99.82%
Number of Times Solvent is Replaced (times/yr)	2.00
Conversion (lb/ton)	2,000
Operating Time (hr/yr)	7,680
Conversion (hr/day)	24

Based on LC 76-46999 - 534926

Table C-36
Monthly Emissions By Emissions Unit (lb/month)
Synthomer PLC - Mogadore, OH

Source	Pollutant	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Boilers 1,2,4	VOC	33.50	33.74	33.02	32.69	23.99	28.70	23.08	22.13	25.55	19.16	26.29	32.48
Boilers 8-12	VOC	37.77	38.03	37.22	36.86	27.04	32.36	26.02	24.95	28.81	21.60	29.64	36.62
Emergency Generator	VOC	0.29	0.59	0.35	0.41	0.35	0.12	0.88	0	0.29	5.43	0.77	0.29
Fire Pumps	VOC	2.77	6.51	3.26	5.63	3.00	3.63	3.95	5.02	2.37	5.09	0.53	4.76
Pressure Washers	VOC	1.77	8.55	4.50	4.58	6.63	5.40	17.65	11.57	3.00	2.87	2.52	4.45
Thermal Oxidizer	VOC	68.99	69.46	67.98	67.31	49.39	59.10	47.51	45.56	52.62	39.44	54.14	66.89
Secondary Vac	OC (VOC)	0.43	0.62	0.62	0.48	0.73	0.52	0.50	0.73	0.43	0.51	0.36	0.36
P004	VOC	0.06	0.02	0.08	0.06	0.15	0.09	0.10	0.22	0.11	0.12	0.09	0.10
P101	VOC	0.05	0.03	0.05	0.03	0.08	0.05	0.04	0.11	0.05	0.10	0.04	0.04
P103	VOC	0.02	0.02	3.65E-03	7.58E-03	0.01	9.27E-03	0.02	0.01	0.02	0.02	0.02	6.46E-03
P106	VOC	6.44E-03	6.24E-03	8.63E-03	4.44E-03	7.11E-03	6.95E-03	5.31E-03	7.33E-03	4.80E-03	7.43E-03	6.75E-03	4.43E-03
P110	VOC	0.02	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.01	6.46E-03
P115	VOC	0.18	0.03	0.21	0.18	0.43	0.25	0.29	0.64	0.32	0.36	0.25	0.29
Pilot Plant Reactors	VOC	3.71E-03	2.20E-03	4.76E-03	3.60E-03	1.86E-03	9.28E-04	2.67E-03	1.51E-03	6.96E-04	4.06E-03	1.39E-03	2.55E-03
P013	VOC	12.71	11.48	12.71	12.30	12.71	12.30	12.71	12.71	12.30	12.71	12.30	12.71
Charm Reactor	VOC	29.49	26.92	28.09	20.98	19.76	30.63	28.06	30.53	19.80	29.99	18.69	16.90
SB Incremental Reactor	VOC	1.15	3.01	3.18	2.06	4.08	5.97	6.51	6.20	3.93	4.38	2.91	2.44
SB Speciality Reactor	VOC	0.19	2.13	1.58	1.44	1.84	1.55	2.13	1.04	0.44	0.25	0.24	1.46
Resin Reactor	VOC	15.47	13.86	16.88	12.07	9.13	12.69	15.66	19.33	8.44	20.33	16.43	11.69
Semi-Continuous Reactor	VOC	1.12	1.58	1.61	1.24	2.07	1.10	0.96	1.91	1.11	1.28	0.93	0.83
CMA	VOC	0	0	0	0	0	0	0	0	0	0	0	0
Tanks W&S	VOC	52.89	35.09	49.72	31.30	30.47	38.65	39.25	37.55	26.78	35.99	44.40	36.49
Total	lb/month	258.45	251.09	260.48	229.20	191.17	232.63	224.85	219.51	185.96	199.13	210.21	228.48
	lb/day	8.34	8.97	8.40	7.64	6.17	7.75	7.25	7.08	6.20	6.42	7.01	7.37
	ton/month	0.13	0.13	0.13	0.11	0.10	0.12	0.11	0.11	0.09	0.10	0.11	0.11

Table C-36
Monthly Emissions By Emissions Unit (lb/month)
Synthomer PLC - Mogadore, OH

Source	Pollutant	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
Boilers 1,2,4	VOC	26.71	33.60	29.86	29.09	25.27	23.37	21.39	20.85	21.27	22.35	18.18	26.95
Boilers 8-12	VOC	30.11	37.88	33.67	32.80	28.49	26.35	24.11	23.50	23.98	25.19	20.50	30.39
Emergency Generator	VOC	0.29	0	0.41	0.29	0.41	0.41	1.95	0.88	0	5.84	0.41	1.24
Fire Pumps	VOC	5.57	2.52	1.89	3.98	3.10	22.65	4.05	17.78	2.65	8.43	0.92	1.65
Pressure Washers	VOC	3.03	3.00	3.02	3.34	1.81	1.24	1.20	0.79	0.03	1.88	1.41	0.94
Thermal Oxidizer	VOC	55.00	69.18	61.49	59.91	52.03	48.13	44.04	42.92	43.74	48.39	36.79	54.98
Secondary Vac	OC (VOC)	0.35	0.57	0.52	0.43	0.23	0.25	0.59	0.53	0.30	0.35	0.36	0.19
P004	VOC	0.14	0.14	0.16	0.18	0.13	0.05	0.10	1.43E-03	0.01	0.08	0.11	0.05
P101	VOC	0	0	0	0	0	0	0	0	0	0	0	0
P103	VOC	0	0	0	0	0	0	0	0	0	0	0	0
P106	VOC	7.54E-03	7.76E-03	3.79E-03	7.09E-03	6.78E-03	6.29E-03	6.15E-03	7.81E-03	4.62E-03	7.59E-03	5.77E-03	3.11E-03
P110	VOC	6.46E-03	0.03	0.02	0.01	0.01	0.01	7.75E-03	6.46E-03	0	6.46E-03	0.02	0.02
P115	VOC	0.43	0.39	0.46	0.54	0.39	0.14	0.29	0	0.04	0.25	0.32	0.14
Pilot Plant Reactors	VOC	5.92E-03	4.29E-03	1.28E-03	3.60E-03	2.20E-03	2.55E-03	1.86E-03	3.71E-03	5.80E-04	3.48E-03	0	2.67E-03
P013	VOC	12.71	11.89	12.71	12.30	12.71	12.30	12.71	12.71	12.30	12.71	12.30	12.71
Charm Reactor	VOC	13.19	11.97	11.14	15.88	13.57	13.05	13.30	16.88	8.41	16.31	14.48	9.25
SB Incremental Reactor	VOC	4.34	5.17	8.21	9.86	8.14	6.30	4.11	5.53	1.25	3.02	4.03	1.80
SB Speciality Reactor	VOC	0.34	0.65	0.54	1.55	0.44	0.50	2.33	1.22	1.11	2.44	2.16	0.76
Resin Reactor	VOC	16.79	19.95	21.67	21.33	16.44	12.61	17.23	13.10	7.35	18.42	19.46	13.99
Semi-Continuous Reactor	VOC	0.91	1.67	1.35	0.80	0.26	0.41	1.55	1.35	0.81	0.68	0.70	0.40
CMA	VOC	0	0	0	0	0.72	0	2.21	0	0	0.72	1.06	0.72
Tanks W&S	VOC	29.24	24.71	25.13	28.48	34.37	30.87	29.07	39.70	34.68	32.83	38.67	35.04
Total	lb/month	198.83	222.75	211.75	220.35	198.31	198.42	179.65	197.25	157.64	199.54	171.54	191.02
	lb/day	6.41	7.68	6.83	7.35	6.40	6.61	5.80	6.36	5.25	6.44	5.72	6.16
	ton/month	0.10	0.11	0.11	0.11	0.10	0.10	0.09	0.10	0.08	0.10	0.09	0.10

Table C-36
Monthly Emissions By Emissions Unit (lb/month)
Synthomer PLC - Mogadore, OH

Source	Pollutant	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25
Boilers 1,2,4	VOC	33.61	34.31	34.31	31.81	30.84	23.97	23.55	20.84	22.65	24.32	16.60	28.73
Boilers 8-12	VOC	37.89	38.68	38.68	35.86	34.76	27.03	26.56	23.50	25.53	27.42	18.72	32.39
Emergency Generator	VOC	0.29	0.29	0	0.59	0.53	0.24	0.29	0.29	7.08	0	1.12	0
Fire Pumps	VOC	2.78	2.68	1.22	2.38	11.84	2.69	2.51	2.13	2.21	3.80	5.40	2.30
Pressure Washers	VOC	1.80	2.57	2.02	1.24	4.34	1.55	51.69	66.98	36.31	63.49	11.34	2.19
Thermal Oxidizer	VOC	68.60	66.11	66.11	66.58	62.76	49.87	48.41	40.11	48.58	49.54	32.45	53.77
Secondary Vac	OC (VOC)	0.38	0.30	0.21	0.40	0.37	0.21	0.30	0.55	0.23	0.17	0.20	0.34
P004	VOC	0.13	0.18	0.14	0.05	0.10	0.05	0.02	0.15	0.02	0.05	2.87E-03	0.07
P101	VOC	0	0	0	0	0	0	0	0	0	0	0	0
P103	VOC	0	0	0	0	0	0	0	0	0	0	0	0
P106	VOC	5.67E-03	4.20E-03	4.00E-03	3.96E-03	3.31E-03	3.14E-03	3.95E-03	4.62E-03	5.46E-03	4.55E-03	3.11E-03	3.51E-03
P110	VOC	9.04E-03	0.01	0.02	0.01	0.02	0.01	0.03	0	0.02	0.02	0.01	5.17E-03
P115	VOC	0.39	0.54	0.39	0.14	0.29	0.14	0.03	0.46	0.04	0.14	0	0.21
Pilot Plant Reactors	VOC	1.74E-03	4.76E-03	4.99E-03	5.22E-03	2.78E-03	1.86E-03	1.39E-03	5.57E-03	3.48E-03	5.34E-03	2.90E-03	3.02E-03
P013	VOC	12.71	11.48	12.71	12.30	12.71	12.30	12.71	12.71	12.30	12.71	12.30	12.71
Charm Reactor	VOC	10.05	14.87	19.67	15.96	14.53	14.08	7.24	8.90	9.50	12.48	8.56	9.73
SB Incremental Reactor	VOC	1.93	0.70	1.74	2.10	2.23	1.84	3.85	3.60	3.58	7.38	1.79	5.96
SB Speciality Reactor	VOC	0.86	0.51	0.21	0.35	1.46	0.95	0.41	0.85	0.35	0	0.54	0.34
Resin Reactor	VOC	7.62	8.17	5.02	2.72	1.56	2.55	7.41	4.63	1.87	7.85	10.93	10.88
Semi-Continuous Reactor	VOC	1.08	0.81	0.39	1.14	0.88	0.40	0.73	1.57	0.49	0.05	0.40	0.81
CMA	VOC	0.72	4.31	2.85	2.15	4.71	1.80	7.71	9.82	3.99	11.33	9.76	3.57
Tanks W&S	VOC	34.15	49.95	56.76	42.13	29.92	37.69	33.29	29.20	34.04	44.73	30.49	29.08
Total	lb/month	214.63	236.19	242.26	217.54	213.47	177.18	226.44	225.78	208.54	265.31	160.44	192.76
	lb/day	6.92	8.44	7.81	7.25	6.89	5.91	7.30	7.28	6.95	8.56	5.35	6.22
	ton/month	0.11	0.12	0.12	0.11	0.11	0.09	0.11	0.11	0.10	0.13	0.08	0.10

Facility-Wide PTE Summary

ID	Company Equipment ID	CO	NO_X	PM_{10} - Filt	PM_{10} - Total	$PM_{2.5}$ - Filt	$PM_{2.5}$ - Total	Lead	SO_2	VOC	Butadiene	Styrene	Total HAP	Basis
B014	Boiler 8	3.03	3.61	0.07	0.27	0.07	0.27	1.80E-05	0.02	0.20	-	-	0.07	AP-42 Section 1.4
B015	Boiler 9	3.03	3.61	0.07	0.27	0.07	0.27	1.80E-05	0.02	0.20	-	-	0.07	AP-42 Section 1.4
B016	Boiler 10	3.03	3.61	0.07	0.27	0.07	0.27	1.80E-05	0.02	0.20	-	-	0.07	AP-42 Section 1.4
B017	Boiler 11	3.03	3.61	0.07	0.27	0.07	0.27	1.80E-05	0.02	0.20	-	-	0.07	AP-42 Section 1.4
B018	Boiler 12	3.03	3.61	0.07	0.27	0.07	0.27	1.80E-05	0.02	0.20	-	-	0.07	AP-42 Section 1.4
B019	Boiler 1	4.42	2.63	0.10	0.40	0.10	0.40	2.63E-05	0.03	0.29	-	-	0.10	AP-42 Section 1.4
B020	Boiler 2	4.42	2.63	0.10	0.40	0.10	0.40	2.63E-05	0.03	0.29	-	-	0.10	AP-42 Section 1.4
B021	Boiler 4	4.42	2.63	0.10	0.40	0.10	0.40	2.63E-05	0.03	0.29	-	-	0.10	AP-42 Section 1.4
B022	Emergency Generator	0.43	1.98	0.14	0.16	0.14	0.16	-	0.13	0.16	-	-	1.74E-03	AP-42 Section 3.3
B024	Big Fire Diesel	0.40	1.84	0.13	0.15	0.13	0.15	-	0.12	0.15	-	-	1.18E-05	AP-42 Section 3.3
F001	Facility Roadways and Parking Areas	-	-	0.02	0.02	0.01	0.01	-	-	-	-	-	-	AP-42, Sections 13.2.1 & 31.2.2
J001	Tank Truck Product Loading Operations	-	-	-	-	-	-	-	-	0.02	-	0.001	0.02	AP-42 Section 5.2
J002	Railcar Product Loading Operations	-	-	-	-	-	-	-	-	0.03	-	0.001	0.03	AP-42 Section 5.2
L001	Building 100 (Maintenance) MEK Parts Washer	-	-	-	-	-	-	-	-	0.15	-	-	-	Engineering Estimate
L002	Building 101 (In-Mold Coatings) MEK Parts Washer	-	-	-	-	-	-	-	-	0.15	-	-	-	Engineering Estimate
L003	Pilot Plant Maintenance Shop Parts Washer													Permanently Shutdown
L004	Main Plant Maintenance Shop Parts Washer	-	-	-	-	-	-	-	-	0.11	-	-	0.03	Engineering Estimate
N001	Pyrolysis Furnace	0.22	0.13	0.09	0.23	0.09	0.23	-	8.8E-03	0.09	-	-	2.03E-03	NOX, PM, SO2, and VOC from PTI 16-1161 converted to tpy; AP-42 Section 1.4 for other combustion pollutants
Incinerator Combustion		9.02	10.95	0.20	0.82	0.20	0.82	5.4E-05	0.06	2.36	6.18	7.93	14.10	AP-42 Section 1.4 for combustion pollutants, unless otherwise noted. NOX, VOC, Styrene, and 1,3-Butadiene based on PTI P0123931 hourly limits x 8760/2000. Total HAP = Styrene + 1,3-Butadiene tpy PTI limits PM from In-mold coatings based on engineering estimates.
P004	Poly/Degas Process	-		-	-	-	-	-	-					
P013	Wastewater Effluent System	-		-	-	-	-	-	-					
P014	BD Distillation Col.	-		-	-	-	-	-	-					
P101	PolyFox Process	-		-	-	-	-	-	-					
P103	Fluoropolymer Purification Process	-		-	-	-	-	-	-					
P106	PP In-Mold Coatings	-		0.62	0.62	0.62	0.62	-	-					
P110	PP Poly #1	-		-	-	-	-	-	-					
P115	PP Poly #6	-		-	-	-	-	-	-					
P017	Haywagon	3.57	16.6	1.17	1.32	1.17	1.32	-	1.10	1.35	-	-	1.1E-04	PTI P0110263 Emission Limits (AP-42, Section 3.3) Limited to 4300 hr/yr
P018	PP Diesel	1.72	8.0	0.56	0.71	0.56	0.71	-	0.52	0.65	-	-	5.1E-05	PTI P0110263 Emission Limits (AP-42, Section 3.3) Limited to 4300 hr/yr
P019	Clarke Fire Pump Engine	0.52	2.43	0.17	1.92E-01	0.17	1.92E-01	-	0.16	0.20	-	-	1.56E-05	AP-42 Section 3.3

Facility-Wide PTE Summary

ID	Company Equipment ID	CO	NO_X	PM_{10} - Filt	PM_{10} - Total	$PM_{2.5}$ - Filt	$PM_{2.5}$ - Total	Lead	SO_2	VOC	Butadiene	Styrene	Total HAP	Basis
P020	Pilot Plant 2-Gallon Reactor #1	-	-	-	-	-	-	-	-	0.07	0.07	0.07	0.07	Engineering Estimate (uncontrolled emissions); conservatively assumes all VOC emissions are styrene and 1,3-Butadiene
P029	Pilot Plant 2-Gallon Reactor #2	-	-	-	-	-	-	-	-	0.07	0.07	0.07	0.07	
P030	Pilot Plant 2-Gallon Reactor #3	-	-	-	-	-	-	-	-	0.07	0.07	0.07	0.07	
P031	Pilot Plant 2-Gallon Reactor #4	-	-	-	-	-	-	-	-	0.07	0.07	0.07	0.07	
P021	Area 43 Cooling Tower													Permanently shutdown, replaced
P022	Butadiene Distillation Column Cooling Tower	-	-	0.27	0.27	0.27	0.27	-	-	-	-	-	-	Engineering Estimate
P023	Pilot Plant Maintenance Shop Sandblaster	-	-	0.06	0.06	0.06	0.06	-	-	-	-	-	-	AP-42 13.2.6
P024	Pilot Plant Lab Hood #1	-	-	-	-	-	-	-	-	0.17	-	-	0.17	Engineering Estimate; Assumes all VOC is HAP.
P042	Pilot Plant Lab Hood #2	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P043	Pilot Plant Lab Hood #3	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P044	Pilot Plant Lab Hood #4	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P045	Pilot Plant Lab Hood #5	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P046	Pilot Plant Lab Hood #6	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P047	Pilot Plant Lab Hood #7	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P048	Pilot Plant Lab Hood #8	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P049	Pilot Plant Lab Hood #9	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P050	Pilot Plant Lab Hood #10	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P051	Pilot Plant Lab Hood #11	-	-	-	-	-	-	-	-	0.17	-	-	0.17	
P025	Pilot Plant Monomer Room Drum Dispensing	-	-	-	-	-	-	-	-	2E-03	-	-	2E-03	Engineering Estimate
P026	Gel Lab Hood #1	-	-	-	-	-	-	-	-	0.07	-	-	0.07	Engineering Estimate
P027	Main Plant Maintenance Shop Grinding Wheels	-	-	0.31	0.31	0.31	0.31	-	-	-	-	-	-	Engineering Estimate
P028	Solution Mix Tank 114	-	-	0.25	0.25	0.25	0.25	-	-	-	-	-	-	Engineering Estimates
P034	Solution Mix Tank 128	-	-	0.30	0.30	0.30	0.30	-	-	-	-	-	-	
P035	Solution Mix Tank 123	-	-	1.12	1.12	1.12	1.12	-	-	-	-	-	-	
P036	Solution Mix Tank 110	-	-	0.08	0.08	0.08	0.08	-	-	-	-	-	-	
P037	Solution Mix Tank 129	-	-	0.01	0.01	0.01	0.01	-	-	-	-	-	-	
P038	Solution Mix Tank 141	-	-	0.01	0.01	0.01	0.01	-	-	-	-	-	-	
P039	Solution Mix Tank 142	-	-	0.80	0.80	0.80	0.80	-	-	-	-	-	-	
P032	Pilot Plant Maintenance	-	-	0.30	0.30	0.30	0.30	0.01	-	-	-	-	1.01E-01	AP-42 Section 12.19
P033	Main Plant Maintenance Shop Cut-Off Saw	-	-	0.97	0.97	0.97	0.97	-	-	-	-	-	-	Engineering Estimate
P040	Malvern Lab Hood #2	-	-	-	-	-	-	-	-	0.23	-	-	2.28E-01	Engineering Estimate
P041	Refractometer Lab Hood	-	-	-	-	-	-	-	-	0.02	-	-	2.46E-02	Engineering Estimate
P052	Catalyst Tank #1	-	-	-	-	-	-	-	-	1.1E-04	-	-	-	TankESP- AP-42, Section 7.1
P053	Catalyst Tank #2	-	-	-	-	-	-	-	-	1.1E-04	-	-	-	TankESP- AP-42, Section 7.1
P054	Reducer Tank #1	-	-	-	-	-	-	-	-	-	-	-	-	Stores dilution of aquoeus solutions, assume no emissions
P055	Reducer Tank #2	-	-	-	-	-	-	-	-	-	-	-	-	Stores dilution of aquoeus solutions, assume no emissions
P056	MET #2	-	-	-	-	-	-	-	-	2.8E-01	-	0.01	0.25	TankESP- AP-42, Section 7.1
P057	MET #1	-	-	-	-	-	-	-	-	1.8E-01	-	0.01	0.16	TankESP- AP-42, Section 7.1
P801	Fugitive Emissions	-	-	-	-	-	-	-	-	0.97	0.38	0.12	0.75	EPA Protocol for Equipment Leak Emission Estimates

Facility-Wide PTE Summary

ID	Company Equipment ID	CO	NO_X	PM_{10} - Filt	PM_{10} - Total	$PM_{2.5}$ - Filt	$PM_{2.5}$ - Total	Lead	SO_2	VOC	Butadiene	Styrene	Total HAP	Basis
T001	Tank T-53-1	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T002	Tank T-53-2	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T003	Tank T-53-3	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T004	Tank T-53-4	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T006	Tank T-53-16	-	-	-	-	-	-	-	-	2.6E-04	-	-	-	TankESP- AP-42, Section 7.1
T007	Tank T-53-8	-	-	-	-	-	-	-	-	1.7E-01	-	0.17	0.17	TankESP- AP-42, Section 7.1
T009	Tank 53-10	-	-	-	-	-	-	-	-	3.0E-04	-	-	-	TankESP- AP-42, Section 7.1
T010	Tank T-53-12	-	-	-	-	-	-	-	-	-	-	-	-	Ammonia (non-VOC/HAP) storage tank
T014	Tank 53-20	-	-	-	-	-	-	-	-	5.0E-01	-	0.50	0.50	PTI P0107784 emission limits
T017	Tank T-53-22	-	-	-	-	-	-	-	-	-	-	-	-	Assumes negligible emissions (solid at room temperature)
T018	Condensate Pretreatment Tank No. T-85-1	-	-	-	-	-	-	-	-	2.3E-02	-	3.15E-03	3.25E-03	TankESP- AP-42, Section 7.1
T019	Condensate Tank #2	-	-	-	-	-	-	-	-	2.3E-02	-	3.15E-03	3.25E-03	TankESP- AP-42, Section 7.1
T020	Tank T-53-31	-	-	-	-	-	-	-	-	1.80	-	-	1.80	PTI 16-1839 emission limit
T025	Tank T-53-38	-	-	-	-	-	-	-	-	4.7E-03	-	-	-	TankESP- AP-42, Section 7.1
T026	PMS Tank #1	-	-	-	-	-	-	-	-	3.1E-02	-	-	-	TankESP- AP-42, Section 7.1
T027	PMS Tank #2	-	-	-	-	-	-	-	-	3.1E-02	-	-	-	TankESP- AP-42, Section 7.1
T028	2-EHA Tank #1	-	-	-	-	-	-	-	-	3.5E-03	-	-	-	TankESP- AP-42, Section 7.1
T029	BA Tank #1	-	-	-	-	-	-	-	-	5.1E-02	-	-	-	TankESP- AP-42, Section 7.1
T030	IBMA Tank #1	-	-	-	-	-	-	-	-	3.7E-02	-	-	-	TankESP- AP-42, Section 7.1
T031	MMA Tank #1	-	-	-	-	-	-	-	-	1.7E-01	-	-	0.17	TankESP- AP-42, Section 7.1
T032	Tank T-53-23	-	-	-	-	-	-	-	-	-	-			Pressurized storage tank, no emissions
T033	Tank T-53-24	-	-	-	-	-	-	-	-	-	-			Pressurized storage tank, no emissions
T034	Condensate Tank #3													Permanently shutdown
T035	Pilot Plant Tank T-201	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T036	Pilot Plant Tank T-303	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T037	Pilot Plant Tank T-301	-	-	-	-	-	-	-	-	-	-	-	-	Pressurized storage tank, no emissions
T038	Product Storage Tank #1	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	TankESP- AP-42, Section 7.1
T039	Product Storage Tank #2	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T040	Product Storage Tank #3	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T041	Product Storage Tank #4	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T042	Product Storage Tank #5	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T043	Product Storage Tank #6	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T044	Product Storage Tank #7	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T045	Product Storage Tank #8	-	-	-	-	-	-	-	-	7.3E-04	-	7.3E-04	7.34E-04	Assumed equivalent to T038 emissions
T046	Product Storage Tank #9	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	TankESP- AP-42, Section 7.1
T047	Product Storage Tank #10	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T048	Product Storage Tank #11	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T049	Product Storage Tank #12	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T050	Product Storage Tank #13	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T051	Product Storage Tank #30	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T052	Product Storage Tank #31	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T053	Product Storage Tank #32	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T054	Product Storage Tank #33	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T055	Product Storage Tank #34	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T056	Product Storage Tank #35	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T057	Product Storage Tank #36	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T058	Product Storage Tank #37	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions

Facility-Wide PTE Summary

ID	Company Equipment ID	CO	NO_X	PM_{10} - Filt	PM_{10} - Total	$PM_{2.5}$ - Filt	$PM_{2.5}$ - Total	Lead	SO_2	VOC	Butadiene	Styrene	Total HAP	Basis
T059	Product Storage Tank #38	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T060	Product Storage Tank #39	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T046 emissions
T061	Product Storage Tank #52	-	-	-	-	-	-	-	-	1.2E-04	-	1.2E-04	1.22E-04	TankESP- AP-42, Section 7.1
T062	Product Storage Tank #53	-	-	-	-	-	-	-	-	1.2E-04	-	1.2E-04	1.22E-04	Assumed equivalent to T061 emissions
T063	Product Storage Tank #54	-	-	-	-	-	-	-	-	7.8E-05	-	7.8E-05	7.83E-05	TankESP- AP-42, Section 7.1
T064	Product Storage Tank #55	-	-	-	-	-	-	-	-	7.8E-05	-	7.8E-05	7.83E-05	Assumed equivalent to T063 emissions
T065	Product Storage Tank #60	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	TankESP- AP-42, Section 7.1
T066	Product Storage Tank #61	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T065 emissions
T067	Product Storage Tank #62	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T065 emissions
T068	Product Storage Tank #63	-	-	-	-	-	-	-	-	2.4E-04	-	2.4E-04	2.45E-04	Assumed equivalent to T065 emissions
T069	Product Storage Tank #64	-	-	-	-	-	-	-	-	3.7E-04	-	3.7E-04	3.67E-04	TankESP- AP-42, Section 7.1
T070	Letdown Tank #1	-	-	-	-	-	-	-	-	1.8E-02	0.02	7.8E-05	0.02	TankESP- AP-42, Section 7.1
T071	Letdown Tank #2	-	-	-	-	-	-	-	-	1.8E-02	0.02	7.8E-05	0.02	TankESP- AP-42, Section 7.1
T072	Glycol Tank #1	-	-	-	-	-	-	-	-	2.4E-07	-	-	-	TankESP- AP-42, Section 7.1
T073	Glycol Tank #2	-	-	-	-	-	-	-	-	2.4E-07	-	-	-	Assumed equivalent to T072 emissions
T074	Finishing Tank #1	-	-	-	-	-	-	-	-	4.1E-04	-	2.4E-04	4.13E-04	TankESP- AP-42, Section 7.1
T075	Finishing Tank #2	-	-	-	-	-	-	-	-	4.1E-04	-	2.4E-04	4.13E-04	TankESP- AP-42, Section 7.1
T076	Tank V-149	-	-	-	-	-	-	-	-	1.5E-02	-	0.02	0.02	TankESP- AP-42, Section 7.1
T077	Tank 53-34	-	-	-	-	-	-	-	-	4.4E-01	-	-	0.44	TankESP- AP-42, Section 7.1
T078	Tank 53-35	-	-	-	-	-	-	-	-	4.4E-01	-	-	0.44	TankESP- AP-42, Section 7.1
T079	Filter Feed Tank #1	-	-	-	-	-	-	-	-	1.3E-03	-	4.4E-05	1.18E-03	TankESP- AP-42, Section 7.1
T080	Filter Feed Tank #2	-	-	-	-	-	-	-	-	1.3E-03	-	4.4E-05	1.18E-03	TankESP- AP-42, Section 7.1
TMP217431	Tank T-53-6.1-02									1.1E-01	-	0.11	0.11	TankESP- AP-42, Section 7.1
TMP217432	Tank T-53-6.1-01									1.3E-01	-	0.13	0.13	TankESP- AP-42, Section 7.1
TMP217433	Tank 11-35									6.5E-02	-	3.4E-04	5.85E-04	TankESP- AP-42, Section 7.1
TMP217455	Area 43 Cooling Tower	-	-	0.10	0.10	0.10	0.10	-	-	-	-	-	-	Engineering Estimate
	Sum:	44.3	67.9	8.3	11.3	8.3	11.3	6.1E-03	2.3	15.3	6.9	9.3	22.4	
	Total Allowable Emissions:	44.3	67.9	8.3	11.3	8.3	11.3	6.1E-03	2.3	15.3	9.99	5.0	24.99	PTI P0123931 facility-wide synthetic minor limits for individual and total HAP

APPENDIX D -
U.S. EPA RBLC SEARCH RESULTS

Table D-1
Summary of RBLC Results - Polymer and Resin Production - VOC
Synthomer Inc. - Mogadore, OH

RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
LA-0295	WESTLAKE FACILITY	7/12/2016	CGP Unit Cooling Tower (3-03, EQT 15)	cooling tower	3000	GPM	Volatile Organic Compounds (VOC)	Monthly hydrocarbon monitoring; maintain equipment to minimize fugitive emissions; repair faulty equipment at the earliest opportunity, but no later than the next scheduled unit shutdown	0.13	LB/H	HOURLY MAXIMUM	-	0	0
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Cooling Tower (P011)	cooling tower	13.88	MMGAL/H	Volatile Organic Compounds (VOC)	(a) VOC content in cooling water shall not exceed a concentration of 0.7 lb/MMgal; (b) Compliance with heat exchange leak monitoring and repair requirements for affected ethylene manufacturing process units contained in 40 CFR Part 63 Subpart XX	42.55	T/YR	PER ROLLING 12 MONTH PERIOD	-	0	0
TX-0175.A	EXXON CHEMICAL AMERICAS	1/4/1988	COOLING TOWER, 3	cooling tower	0	0	Volatile Organic Compounds (VOC)	-	0.7	T/YR	-	-	0	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	COOLING TOWER	cooling tower	0	0	Volatile Organic Compounds (VOC)	WILL DO MONTHLY SAMPLING	1.32	LB/H	-	5.79	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	COOLING TOWER	cooling tower	0	0	Volatile Organic Compounds (VOC)	NONE INDICATED	0.6	LB/H	-	2.59	T/YR	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	COOLING TOWER	cooling tower	0	0	Volatile Organic Compounds (VOC)	Monthly monitoring cooling water for VOC content	-	-	-	-	0	0
TX-0929	FORMOSA POINT COMFORT PLANT	10/15/2021	COOLING TOWER	cooling tower	-	-	Volatile Organic Compounds (VOC)	One cooling tower (EPN: PE3-12) provides process cooling for the new unit. This cooling tower is non-contact design. Monthly monitoring of VOC content of the cooling water in addition to a VOC leak detection system will be implemented.	-	-	-	-	0	0
LA-0195	LAKE CHARLES FACILITY	7/30/2003	DRYING LINES	dryer	106000	LB/H	Volatile Organic Compounds (VOC)	STEAM STRIPPING OF SOLVENT FROM CRUMB RUBBER. EMISSIONS STREAM FROM STRIPPING OPERATION IS COLLECTED AND ROUTED TO FLARE.	315.25	LB/H	HOURLY MAXIMUM	1380.81	T/YR	ANNUAL MAXIMUM
IA-0084	ADM POLYMERS	11/30/2006	PELLETIZER DRYER	dryer	3.15	T/H	Volatile Organic Compounds (VOC)	-	80	T/YR	365 DAY ROLLING TOTAL	3500	PPMD	30 DAY ROLLING AVERAGE
IA-0084	ADM POLYMERS	11/30/2006	BIOMASS POLYMER DRYERS	dryer	90	T/H	Volatile Organic Compounds (VOC)	THERMAL OXIDIZER	15.4	T/H	ROLLING 12 MONTH TOTAL	20	PPM AS CARBON	AVERAGE OF THREE (3) TEST RUNS
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	P1 PELLET DRYER EXHAUST	dryer	0	0	Volatile Organic Compounds (VOC)	PURGING IN THE BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 1	-	0	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	PELLET DRYER	dryer	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED. VOC CONCENTRATION IS ESTIMATED FROM A SIMILAR PHILLIPS PLANT AT 15 PPMV. A POST-EXTRUDER EMISSION	0.66	LB/H	-	2.9	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	(2) PELLET DRYER EXHAUST	dryer	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.72	LB/H	EACH	0.96	T/YR	EACH
VA-0050	VIRGINIA CHEMICALS, INC.	12/5/1986	DRIER TOP, #7, 26, 29, 30	dryer	-	-	Volatile Organic Compounds (VOC)	-	0.3	LB/H EA	-	1.3	LB/H EA	0
VA-0050	VIRGINIA CHEMICALS, INC.	12/5/1986	DRIER BOTTOM, #8, 9, 10, 11, 27, 28	dryer	-	-	Volatile Organic Compounds (VOC)	-	1.1	LB/H EA	-	4.9	T/YR EA	0
VA-0050.A	VIRGINIA CHEMICALS, INC.	9/11/1987	DRYER, TOP VENT #36,37	dryer	0	SEE NOTES	Volatile Organic Compounds (VOC)	-	0.18	LB/H	-	0.8	T/YR, EA	0
VA-0050.A	VIRGINIA CHEMICALS, INC.	9/11/1987	DRYER, BOTTOM VENT #38,39	dryer	0	SEE NOTES	Volatile Organic Compounds (VOC)	-	0.68	LB/H	-	3	T/YR, EA	0
LA-0364	FG LA COMPLEX	1/6/2020	LDPE Pellet Dryer Vent Filter	dryer	0	0	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 63 Subpart FFFF.	-	-	-	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	G-1 AND G-2 FLUID BED COOLER	dryer	0	0	Volatile Organic Compounds (VOC)	PURGING IN BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 1	-	0	0
LA-0195	LAKE CHARLES FACILITY	7/30/2003	PROCESS FUGITIVES	Fugitives	0	0	Volatile Organic Compounds (VOC)	LDAR PROGRAM - 40 CFR 63 SUBPART I	18.3	LB/H	HOURLY MAXIMUM	81.21	T/YR	ANNUAL MAXIMUM
IA-0084	ADM POLYMERS	11/30/2006	LEAKS FROM EQUIPMENT IN VOC SERVICE	Fugitives	-	-	Volatile Organic Compounds (VOC)	LDAR (LEAK DETECTION AND REPAIR)	60.9	T/YR	ROLLING 12 MONTH TOTAL	-	0	0
LA-0295	WESTLAKE FACILITY	7/12/2016	Facility Fugitive Emissions (FUG 4)	Fugitives	-	-	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR): LAC 33:III.2122	-	-	-	-	0	0
LA-0296	LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	5/23/2014	LDPE Fugitives (FUG 13)	Fugitives	-	-	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 60 Subpart VVa	17.44	TPY	ANNUAL MAXIMUM	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Fugitive Emissions	Fugitives	-	-	Volatile Organic Compounds (VOC)	Compliance with applicable provisions 40 CFR 63 Subpart UU.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Fugitive Emissions HON	Fugitives	-	-	Volatile Organic Compounds (VOC)	Compliance with applicable provisions 40 CFR 63 Subpart H.	-	-	-	-	0	0

Table D-1
Summary of RBLC Results - Polymer and Resin Production - VOC
Synthomer Inc. - Mogadore, OH

RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Fugitive Emissions (P807)	Fugitives	-	-	Volatile Organic Compounds (VOC)	Enhanced connector monitoring requirements to the most stringent leak detection and repair (LDAR) regulation applicable to affected equipment/process units. The following identifies LDAR requirements for affected equipment/process units which have been determined to representative of BACT: i.40 CFR Part 63 Subpart UU as applicable to the ethylene manufacturing process with enhanced connector monitoring; ii.40 CFR Part 60 Subpart VVa as applicable to the polyethylene manufacturing process with enhanced connector monitoring; The LDAR programs indicated above which are representative of BACT shall implement the following enhanced connector monitoring requirements: i.Connector monitoring subsequent to the initial monitoring required shall be performed on a quarterly basis; ii.If following the initial four (4) consecutive quarters, the percent leaking connectors in a process unit is less than 0.5 percent during the most recent quarterly monitoring event, then the frequency of connector monitoring can be reduced to semi-annual; iii.If following two (2) consecutive semi-annual periods, the percent leaking connectors in a process unit is less than 0.5 percent during the most recent semi-annual monitoring event, then	99.38	T/YR	PER ROLLING 12 MONTH PERIOD. SEE NOTES.	-	0	0
TX-0175.A	EXXON CHEMICAL AMERICAS	1/4/1988	FUGITIVE	fugitives	-	-	Volatile Organic Compounds (VOC)	-	9.8	T/YR	-	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	FUGITIVES, BLOCK 25	fugitives	-	-	Volatile Organic Compounds (VOC)	MONITORED BY 28M	0.18	LB/H	-	0.36	T/YR	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	FUGITIVES, BLOCK 17	fugitives	-	-	Volatile Organic Compounds (VOC)	MONITORED BY 28M.	0.3	LB/H	-	1.3	T/YR	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	UNIT FUGITIVES BLOCK 26	fugitives	-	-	Volatile Organic Compounds (VOC)	MONITORED BY 28M	5.34	LB/H	-	22.53	T/YR	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	FUGITIVES, BLOCK 12	fugitives	-	-	Volatile Organic Compounds (VOC)	MONITORED BY 28M	0.17	LB/H	-	0.74	T/YR	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	PROCESS FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	A 28MID PROGRAM WILL BE USED.	15.34	LB/H	-	67.19	T/YR	0
TX-0278	FORMOSA PLASTICS CORPORATION	01/01/2000 EST	PROCESS FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	3.35	LB/H	-	14.67	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	TANK FARM FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	INTENSIVE DIRECTED MAINTENANCE.	0.28	LB/H	-	1.21	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	TANKS FT-D19A AND B FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	INTENSIVE DIRECTED MAINTENANCE.	0.12	LB/H	-	0.54	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	DOCK FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	INTENSIVE DIRECTED MAINTENANCE.	0.09	LB/H	-	0.35	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	28 MID	2.44	LB/H	-	10.7	T/YR	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	28 MID	-	-	-	-	0	0
TX-0929	FORMOSA POINT COMFORT PLANT	10/15/2021	FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	modified 28VHP LDAR program in VOC service. A more stringent 500ppmv leak definition of 28MID is used. Annual 28CNTA monitoring is voluntarily used.	-	-	-	-	0	0
TX-0945	FORMOSA POINT COMFORT PLANT OL3	4/6/2023	FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	28 VHP LDAR	-	-	-	-	0	0
TX-0966	EQUSTAR LAPORTE COMPLEX	11/14/2023	FUGITIVES	fugitives	-	-	Volatile Organic Compounds (VOC)	28LAER LDAR program	-	-	-	-	0	0
IA-0084	ADM POLYMERS	11/30/2006	LOADOUT SILOS	loading	7550	CF	Volatile Organic Compounds (VOC)	-	80	T/YR	365 DAY ROLLING TOTAL	3500	PPMD	30 DAY ROLLING AVERAGE
LA-0364	FG LA COMPLEX	1/6/2020	HDPE2 Low Polymer Tank Truck Loading	loading	4861689	gal/yr	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a thermal oxidizer or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE2 Oilgomer Tank Truck Loading	loading	486209	gal/yr	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a thermal oxidizer or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	PP Tank Truck Loading	loading	24000	gal/h	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Uncontrolled Barge Dock Loading (Heavy Oil)	loading	264151	gal/h	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Barge Loading (Pyrolysis Gasoline)	loading	-	-	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Railcar Loading	loading	63396	gal/h	Volatile Organic Compounds (VOC)	Compliance with all applicable provisions of 40 CFR 63 Subpart YY and routing through a closed vent system to a flare.	-	-	-	-	0	0

Table D-1
Summary of RBLC Results - Polymer and Resin Production - VOC
Synthomer Inc. - Mogadore, OH

RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
LA-0364	FG LA COMPLEX	1/6/2020	LOG Tank Truck Loading	loading	31698	gal/h	Volatile Organic Compounds (VOC)	Compliance with all applicable provisions of 40 CFR 63 Subpart YY and routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Tanker Dock Loading	loading	660377	gal/h	Volatile Organic Compounds (VOC)	Submerged loading.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Uncaptured Tank Truck Loading (Heavy Oil)	loading	-	-	Volatile Organic Compounds (VOC)	Good operating practices.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Railcar and Barge Dock Loading (Ethylene Glycol)	loading	-	-	Volatile Organic Compounds (VOC)	Compliance with all applicable provisions of 40 CFR 63 Subpart G.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Railcar Loading (Pyrolysis/Heavy Oil)	loading	-	-	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LDPE Compressor Used Oil Storage and Loading	loading	-	-	Volatile Organic Compounds (VOC)	Good operating practices.	0.01	T/YR	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LDPE Spent Lube Oil and Wax Loading	loading	-	-	Volatile Organic Compounds (VOC)	-	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LDPE Wax and Column Heavy Ends Loading	loading	-	-	Volatile Organic Compounds (VOC)	-	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET1 Tank Truck Loading	loading	185100	bbl/yr	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET2 Tank Truck Loading	loading	185100	bbl/yr	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE1 Low Polymer Tank Truck Loading	loading	-	-	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a thermal oxidizer or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE1 Oilgomer Tank Truck Loading	loading	486209	gal/yr	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a thermal oxidizer or flare.	-	-	-	-	0	0
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Light and Heavy Pygas Railcar Loading (J001)	loading	-	-	Volatile Organic Compounds (VOC)	Thermal oxidizer (TO) achieving a destruction efficiency of >99.5%. The TO controlling heavy and light pygas railcar loading operations is permitted as a separate and individual emissions unit (emissions unit P001 or P002). For efficient permitting structure, the applicable operational restrictions, monitoring, record keeping, reporting, and testing associated with TO control are contained within the requirements of emissions unit P001 and P002. A separate emissions unit (P807) associated with fugitive leaks of VOC, HAP*, VHAP/Benzene*, and GHGs* from all component equipment at the facility subject to the leak control and repair regulations above has been established. For efficient permitting structure, the applicable requirements (limitations, operational restrictions, monitoring, record keeping, reporting, and testing) associated with equipment leak control and repair for VOC, HAP*, VHAP/Benzene*, and GHGs* are contained within the requirements of emissions	-	-	SEE NOTES.	-	0	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	PELLET LOADOUT FILTER	loading	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED. THE TOTAL PELLET EMISSIONS ARE LESS THAN 50 PPMW.	1.38	LB/H	-	6.05	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	MEG LOADING	loading	5000	GAL/MIN	Volatile Organic Compounds (VOC)	MEG MAY BE LOADED INTO MARINE VESSELS WITHOUT CONTROLS	1.05	LB/H	-	0.11	T/YR	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	WASTEWATER LOADING RACK	loading	-	-	Volatile Organic Compounds (VOC)	Tank trucks pressure rated greater than 15 psig and loading operations routed to flare for control of emissions	-	-	-	-	0	0
TX-0238	PHILLIPS CHEMICAL COMPANY	7/28/1997	PRODUCTION OF BUTADIENE-STYRENE COPOLYMER	reactor/production	-	-	Volatile Organic Compounds (VOC)	28 LAER, W/ QUARTERLY INSTRUMENT FLANGE MONITORING. ALSO MONITORING OF COOLING TOWERS TO DETECT LEAKS	200	PPMW	LESS THAN OR EQUAL TO	-	0	0
TX-0246	GOODYEAR TIRE AND RUBBER COMPANY	2/19/1999	RUBBER PRODUCTION	reactor/production	-	-	Volatile Organic Compounds (VOC)	AIR STRIPPER, RTO, EXPANDOR, 28 LAER, FLARE	-	-	SEE NOTE	-	0	0
AL-0033	CIBA-GEIGY CORP.	11/7/1988	FLARE, RESIN PROD. UNIT	reactor/production	76.4	MMLB/YR	Volatile Organic Compounds (VOC)	SMOKELESS FLARE	0.97	LB/H	-	-	0	0
AL-0033	CIBA-GEIGY CORP.	11/7/1988	LDRP, RESIN PROD. UNIT	reactor/production	76.4	MMLB/YR	Volatile Organic Compounds (VOC)	LEAK DETECTION & REPAIR PROGRAM	28	LB/H	-	-	0	0
AL-0038	ELF ATOCHEM NORTH AMERICA	10/18/1988	DRYER/CONVEYOR/MILL, LATEX POLYMER UNIT	reactor/production	21	MMLB/YR	Volatile Organic Compounds (VOC)	LEAK DETECTION & REPAIR PROGRAM	2.48	LB/H	-	-	0	0
CA-0785	CARPENTER CO.	12/6/1996	NON-WOVEN POLYESTER FOAM LINE	reactor/production	1800	LB/H	Volatile Organic Compounds (VOC)	NO CONTROL	-	-	-	-	0	0
CA-0785	CARPENTER CO.	12/6/1996	ADHESIVE APPLICATION PROCESS	reactor/production	-	-	Volatile Organic Compounds (VOC)	LOW-VOC ADHESIVES	8.4	LB/DAY	-	0.49	LB/GAL	0
IA-0084	ADM POLYMERS	11/30/2006	MAIN FERMENTERS	reactor/production	143700	GAL	Volatile Organic Compounds (VOC)	-	40	PPMVD	CARBON - ROLLING 30 DAY AVERAGE	50.2	T/YR	VOC - ROLLING 12 MONTH TOTAL

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RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
IA-0084	ADM POLYMERS	11/30/2006	SEED FERMENTERS	reactor/production	8100	GAL	Volatile Organic Compounds (VOC)	-	40	PPMVD	CARBON - ROLLING 30 DAY AVERAGE	2.51	T/YR	VOC - ROLLING 12 MONTH TOTAL
IL-0066	DEVRO-TEEPAK	8/18/1998	MACHINES, THREE PROCESS, #8-#10	reactor/production	2200	T/YR	Volatile Organic Compounds (VOC)	USE OF CONVENTIONAL VISCOSE PROCESS, OR AN ENHANCED PROCESS, REQUIRED.	-	SEE P2 DESCRIPTION	-	-	0	0
LA-0083	WESTLAKE POLYMERS CORPORATION	11/16/1992	POLYETHYLENE PRODUCTION	reactor/production	875	MMLB/YR	Volatile Organic Compounds (VOC)	LEAK DETECTION (USING A LEAK DETECTION OF 5000 PPMV IN THE FUGITIVE EMISSIONS MONITORING PLAN), THE NUMBER OF LEAKING COMPONENTS SHALL BE KEPT BELOW 2% ON A QUARTERLY BASIS	50	T/YR	-	-	0	0
LA-0110	WESTLAKE PETROCHEMICALS CORPORATION	4/23/1997	POLYETHYLENE PLANT	reactor/production	626	MMT/YR	Volatile Organic Compounds (VOC)	STRIPPING ETHYLENE RESIDUE IN PE POWDER TO 60 PPMW	60	LB/MMLB	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Ethylene Decoking Drums	reactor/production	8000	lb/h	Volatile Organic Compounds (VOC)	Operation of the pyrolysis furnaces to minimize coke buildup and minimize the frequency of required decoking.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET1 Distillation Units	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET2 Distillation Units	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	PR Distillation Units and Reactors	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing distillation units and reactor vents through a closed vent system to flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LDPE Compressor, Reactor, Separators, and Extruder	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to thermal oxidizers and or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	EG1 Glycol Dehydrator, Columns, Reactors, EO Absorber, and EO Stripper	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to thermal oxidizer and flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	EG2 Glycol Dehydrator, Reactors, Columns, EO Adsober, and EO Stripper	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to thermal oxidizer and flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET1 and ET2 MAPD Regeneration Vents	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	-	-	-	-	0	0
LA-0371	LAKE CHARLES CHEMICAL COMPLEX	11/7/2019	ALC Reactors	reactor/production	-	-	Volatile Organic Compounds (VOC)	closed vent system to a flare	-	-	-	-	0	0
LA-0371	LAKE CHARLES CHEMICAL COMPLEX	11/7/2019	GUR Process Vent	reactor/production	-	-	Volatile Organic Compounds (VOC)	Closed vent system to thermal oxidizer(s)	-	-	-	-	0	0
OH-0159	PERSTORP POLYOLS	8/24/1988	IMP FORMATE	reactor/production	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	CATALYTIC INCINERATOR, LEAK DETECTION PROGRAM	0.5	LB/H	-	-	0	0
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Ethylene Manufacturing Unit (P801)	reactor/production	-	-	Volatile Organic Compounds (VOC)	high pressure (HP) flare achieving a destruction efficiency of 98% for VOC emissions and thermal oxidizer (TO) achieving a destruction efficiency of 99.5% for VOC emissions. See notes.	-	-	-	-	0	0
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	High-Density Polyethylene Manufacturing Unit #1 (P802)	reactor/production	-	-	Volatile Organic Compounds (VOC)	Use of closed vent system controlled with high pressure (HP) flare achieving a destruction efficiency of 98% for VOC emissions, use of thermal oxidizer (TO) achieving a destruction efficiency of 99.5% for VOC emissions, implementation of facility specific program reducing fugitive component equipment leaks including applicable component equipment in the polyethylene manufacturing line and implementation of a program to minimize flaring.	0.0054	LB/MMBTU	SEE NOTES.	0.03	LB/H	SEE NOTES.
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	High-Density Polyethylene Manufacturing Unit #2 (P803)	reactor/production	-	-	Volatile Organic Compounds (VOC)	Use of closed vent system controlled with high pressure (HP) flare achieving a destruction efficiency of 98% for VOC emissions, use of thermal oxidizer (TO) achieving a destruction efficiency of 99.5% for VOC emissions, implementation of facility specific program reducing fugitive component equipment leaks including applicable component equipment in the polyethylene manufacturing line and implementation of a program to minimize flaring.	0.0054	LB/MMBTU	SEE NOTES.	0.03	LB/H	SEE NOTES.

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OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Linear Low/High-Density Polyethylene Manufacturing Unit #3 (P804)	reactor/production	-	-	Volatile Organic Compounds (VOC)	Thermal oxidizer with a destruction efficiency of 99.5% from analyzer vents, degassing column vents, ethylene purification, low product purge bin vent filter, and high pressure accumulator vent. Closed vent system controlled with flare (high pressure (HP) and/or low pressure (LP)) with a destruction efficiency of 98% from butene dryer regen vent, hexene dryer regen vent, ICA dryer regen vent, ethylene deoxo regen vent, ethylene dryers regen vent, ethylene systems shutdown, non-emergency reactor vents, and product purge bin vent filter. Pressure safety valve (PSV) leaks/releases from raw materials supply pressure PSVs, purification PSVs, reaction PSVs, resin degassing PSVs, and vent recovery PSVs. Implementation of facility specific program reducing fugitive component equipment leaks including applicable component equipment in the polyethylene manufacturing line. Implementation of a program to minimize flaring.	80	PPM	BY VOLUME. SEE NOTES.	36	T/YR	PER ROLLING 12 MONTH PERIOD. SEE NOTES.
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Linear Low/High-Density Polyethylene Manufacturing Unit #4 (P805)	reactor/production	-	-	Volatile Organic Compounds (VOC)	Thermal oxidizer with a destruction efficiency of 99.5% from analyzer vents, degassing column vents, ethylene purification, low product purge bin vent filter, and high pressure accumulator vent. Closed vent system controlled with flare (high pressure (HP) and/or low pressure (LP)) with a destruction efficiency of 98% from butene dryer regen vent, hexene dryer regen vent, ICA dryer regen vent, ethylene deoxo regen vent, ethylene dryers regen vent, ethylene systems shutdown, non-emergency reactor vents, and product purge bin vent filter. Pressure safety valve (PSV) leaks/releases from raw materials supply pressure PSVs, purification PSVs, reaction PSVs, resin degassing PSVs, and vent recovery PSVs. Implementation of facility specific program reducing fugitive component equipment leaks including applicable component equipment in the polyethylene manufacturing line. Implementation of a program to minimize flaring.	80	PPM	BY VOLUME. SEE NOTES.	36	T/YR	PER ROLLING 12 MONTH PERIOD. SEE NOTES.
TX-0160	HIMONT USA, INC.	2/11/1985	POLYPROPYLENE PROCESS	reactor/production	260	MMLB/YR	Volatile Organic Compounds (VOC)	FLARE	25.9	T/YR	-	-	0	0
TX-0175.A	EXXON CHEMICAL AMERICAS	1/4/1988	DRUM VENT	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	5	T/YR	-	-	0	0
TX-0236	PHILLIPS CHEMICAL COMPANY	12/15/1998	POLYOLEFINS - MFG.	reactor/production	-	-	Volatile Organic Compounds (VOC)	LAER W/FLARE MONITORING, VENT PRODUCT OFF-GASES/ PRODUCT LOADING EMISSIONS TO FLARE	-	-	SEE POLLUTANT NOTE	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	ANALYZER VENTS	reactor/production	-	-	Volatile Organic Compounds (VOC)	PROCESS VENTS ARE ROUTED TO ONE OF TWO FLARE SYSTEMS. EACH PROVIDES 98% DRE. VENTS NOT ROUTED TO FLARES ARE EITHER INSIGNIFICANT, OR IT IS NOT TECHNICALLY OR ECONOMICALLY FEASIBLE	0.2	LB/H	-	0.88	T/YR	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	NO. 2 SILICA ACTIVATOR	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED. BACT IS APPLIED.	127.89	LB/H	-	10.24	T/YR	0
TX-0278	FORMOSA PLASTICS CORPORATION	01/01/2000 EST	FINAL DEGASSER NO. 1	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	6.19	LB/H	-	26.86	T/YR	0
TX-0278	FORMOSA PLASTICS CORPORATION	01/01/2000 EST	CATALYST FILLING VENT NO. 1	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.02	LB/H	-	0.1	T/YR	0
TX-0278	FORMOSA PLASTICS CORPORATION	01/01/2000 EST	CATALYST FILLING VENT NO. 2	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	8.8	LB/H	-	0.1	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	ALKYL SEAL POT	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.36	LB/H	-	1.06	T/YR	0
TX-0438	FORMOSA PLASTICS TEXAS	3/9/1999	POLYPROPYLENE RESIN REACTOR	reactor/production	145000	t/yr	Volatile Organic Compounds (VOC)	HDPE INCINERATOR	31.5	LB/MMLB	TRAIN #4, LB PER MILLION LB	133	LB/MMLB	TRAINS 1 - 3, LB PER MILLION LB

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TX-0703	LOW DENSITY POLYETHYLENE (LDPE) PLANT	8/8/2014	Low Density Polyethylene Production	reactor/production	-	-	Volatile Organic Compounds (VOC)	Process vents (upstream of the extruder) will be flared or recycled to process for control of VOC. No control is proposed for process vents at or downstream of the extruder (meets Tier 1 BACT for emissions in the range of 155 lb VOC/MMlb product). The pellet degassing silos are routed to a flare or Regenerative Thermal Oxidizer for control of VOC emissions. The Flare will meet 40CFR60.18 requirements and will provide 98 wt.% DRE. Fixed roof storage tans are less than 25,000 gallon capacity, in service for materials of less than 0.5 psia, painted white and aluminum, located out of direct sunlight and either re-filled off-site or by submerged fill on-site. Fugitive emissions are mimized by a modified 28 VHP Leak Detection and Repair program, using 500 ppm leak definition. VOC emission from loading are controlled by submerged fill for materials of vapor pressure <0.5 psia. For materials with VP>0.5 psia fom the	-	-	-	-	0	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	PROCESS VENTS	reactor/production	-	-	Volatile Organic Compounds (VOC)	FLARE	-	-	-	-	0	0
TX-0901	EQUISTAR CHEMICALS LA PORTE COMPLEX	11/6/2020	Process Vents (EPN: LBFLARE)	reactor/production	312	GAL/TANK/DAY	Volatile Organic Compounds (VOC)	Flare - 99% DRE for all VOC up to three carbons and 98% DRE for all other VOCs	-	-	-	-	0	0
TX-0929	FORMOSA POINT COMFORT PLANT	10/15/2021	PROCESS VENTS (PE3-02A, PE3-02B, and PE3-07, PE3-08A, PE3-08B)	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	-	-	-	-	0	0
TX-0929	FORMOSA POINT COMFORT PLANT	10/15/2021	PROCES VENTS	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	-	-	-	-	0	0
TX-0929	FORMOSA POINT COMFORT PLANT	10/15/2021	Polyethylene 3 (PE3) Unit	reactor/production	-	-	Volatile Organic Compounds (VOC)	Flare and Thermal Oxidizers	-	-	-	-	0	0
TX-0945	FORMOSA POINT COMFORT PLANT OL3	4/6/2023	PROCESS VENTS OL3	reactor/production	-	-	Volatile Organic Compounds (VOC)	Controlled by existing elevated flares and cross piping with new enclosed ground flares	-	-	-	-	0	0
TX-0966	EQUSTAR LAPORTE COMPLEX	11/14/2023	REGENERATION VENTS	reactor/production	-	-	Volatile Organic Compounds (VOC)	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-l Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams.	-	-	-	-	0	0
VA-0050	VIRGINIA CHEMICALS, INC.	12/5/1986	REACTOR, #1, 2, 3, 4	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	0.01	LB/H EA	-	0.02	T/YR EA	0
VA-0050	VIRGINIA CHEMICALS, INC.	12/5/1986	PLANT, POLYACRYLIC POWER	reactor/production	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	-	4.9	LB/H TOTAL	-	21.3	T/YR TOTAL	0
VA-0050.A	VIRGINIA CHEMICALS, INC.	9/11/1987	REACTOR, #33,34	reactor/production	-	SEE NOTES	Volatile Organic Compounds (VOC)	-	0.01	LB/H	-	0.05	T/YR, EA	0
VA-0093	ALLOY POLYMERS, INC.	10/1/1987	EXTRUDER, SCREW, 2	reactor/production	1500	LB/H	Volatile Organic Compounds (VOC)	THROUGHPUT LIMITS	0.06	LB/H	-	0.01	T/YR	0
VA-0093	ALLOY POLYMERS, INC.	10/1/1987	EXTRUDER, SCREW, 2	reactor/production	1500	LB/H	Volatile Organic Compounds (VOC)	THROUGHPUT LIMITS	0.38	LB/H	-	0.8	T/YR	0
VA-0093	ALLOY POLYMERS, INC.	10/1/1987	EXTRUDER, SCREW, 2	reactor/production	1500	LB/H	Volatile Organic Compounds (VOC)	THROUGHPUT LIMITS	0.38	LB/H	-	0.8	T/YR	0
CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI PROCESS (2)	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OF REPLACEMENT OFMETHYLCHLORIDE	5	SEE * FACILITY NOTES	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI PROCESS	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	11.5	SEE * FACILITY NOTES	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI PROCESS	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	6.5	SEE * FACILITY NOTES	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	POLYSTYRENE MFG	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	0.12	SEE ** FACILITY NOTE	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	ACRYLONITRILE MFG	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	0.12	SEE ** FACILITY NOTE	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI PROCESS (2)	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	4.5	SEE * FACILITY NOTES	-	-	0	0

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CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI PROCESS	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT A PROGRAM OF REDUCTION OR REPLACEMENT OFMETHYLCHLORIDE	8.5	SEE * FACILITY NOTES	-	-	0	0
CT-0118	DOW CHEMICAL USA	12/5/1988	STYROFOAM MFG	reactor/production	-	-	Volatile Organic Compounds (VOC)	IMPLEMENT PROGRAM OF REDUCTION OR REPLACEMENT OF METHYLCHLORIDE	-	SEE P2	-	-	0	0
TX-0243	SOLUTIA, INC.	11/5/1998	ACRYLONITRILE MFG.	reactor/production	-	-	Volatile Organic Compounds (VOC)	WASTE HEAT BOILER (99.99% DRE), 28 LAER, GAS CHROMATOGRAPHY, FLARE (99% DRE)	-	-	SEE NOTE	-	0	0
IN-0190	FAGERDALA PACKAGING INC. (INDIANA)	6/12/2014	POLYETHYLENE SHEET FOAM EXTRUDER LINE (SFE-01)	reactor/production	684	LB/H RESIN	Volatile Organic Compounds (VOC)	REGENERATIVE THERMAL OXIDIZER	98	% OVERALL CONTROL	-	241.4	T/YR ISOBUTANE	0
IN-0210	FAGERDALA PACKAGING INC. (INDIANA)	6/8/2015	POLYETHYLENE SHEET FOAM EXTRUDER LINE	reactor/production	684	LB/H RESIN	Volatile Organic Compounds (VOC)	REGENERATIVE THERMAL OXIDIZER (RTO) WITH PERMANENT TOTAL ENCLOSURE (PTE)	366.61	TONS	TWELVE CONSECUTIVE MONTH PERIOD	98	% OVERALL CONTROL	0
LA-0364	FG LA COMPLEX	1/6/2020	ET1 Spent Caustic Oxidation Unit Process Vent	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to vapor combustors.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET2 Spent Caustic Oxidation Unit Vent	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to vapor combustors.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Caustic Area Carbon Canister Vents	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vents to carbon canisters.	0.01	T/YR	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	PP Catalyst Prep, Polymerization Reactors, Polypropylene Recovery, Extruder	reactor/production	-	-	Volatile Organic Compounds (VOC)	Routing process vent through a closed vent system to thermal oxidizer and flare.	-	-	-	-	0	0
MI-0322	FAGERDALA PAC-LITE INCORPORATED	2/1/2001	EXTRUSION, POLYETHYLENE	reactor/production	-	-	Volatile Organic Compounds (VOC)	HOODED DIE AREAS CONTROLLED BY THERMAL OXIDIZER 12-20% CAPTURE TEST REQUIRED WITHIN 180 DAYS	12	% REDUCTION	-	35	PPH	0
MI-0322	FAGERDALA PAC-LITE INCORPORATED	2/1/2001	EXTRUSION, POLYPROPYLENE	reactor/production	-	-	Volatile Organic Compounds (VOC)	HOODED DIE AREAS CONTROLLED BY THERMAL OXIDIZER.	37	% REDUCTION	-	35	PPH	0
MI-0322	FAGERDALA PAC-LITE INCORPORATED	2/1/2001	EXPANDABLE POLYPROPYLENE BEAD PRODUCTION	reactor/production	-	-	Volatile Organic Compounds (VOC)	THERMAL OXIDIZER.	85	% REDUCTION	-	35	PPH	PLANT LIMIT
OK-0112	MUSKOGEE MILL	3/27/2006	POLYETHYLENE EXTRUDERS #2-4	reactor/production	-	-	Volatile Organic Compounds (VOC)	-	0.14	T/YR	-	-	0	0
PA-0168	MARKEL CORPORATION	3/22/2000	HORIZONTAL EXTRUDER	reactor/production	115	F/MIN	Volatile Organic Compounds (VOC)	EXHAUST INTO EXISTING CONTROL EQUIPMENT (CATALYTIC OXIDIZER).	9	T/YR	-	-	0	0
TX-0175.A	EXXON CHEMICAL AMERICAS	1/4/1988	EXTRUDER	reactor/production	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	-	4.5	T/YR	-	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	NO. 1 GRANULAR MAKE BAGHOUSE	reactor/production	-	-	Volatile Organic Compounds (VOC)	PURGING IN THE BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 1	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	NO. 2 GRANULAR MAKE BAGHOUSE	reactor/production	-	-	Volatile Organic Compounds (VOC)	PURGING IN BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 2	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	G-1 G-2 SEAL SYSTEM VENTS	reactor/production	-	-	Volatile Organic Compounds (VOC)	PROCESS VENTS ROUTED TO ONE OF TWO FLARES. VENTS NOT ROUTED TO FLARES ARE EITHER INSIGNIFICANT, TECHNICALLY INFEASIBLE, OR ECONOMICALLY PROHBITIVE. IT IS NOT INDICATED WHICH ARE ROUTED TO FLARES	0.2	LB/H	EACH	0.88	T/YR	EACH
TX-0278	FORMOSA PLASTICS CORPORATION	01/01/2000 EST	PELLETIZERS NO. 1 2	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	2.82	LB/H	EACH	12.22	T/YR	EACH
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	(2) PELLET REFEED BIN VENT	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.72	LB/H	EACH	0.01	T/YR	LESS THAN, EACH
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	(2) INLINE BLENDER VENT FILTER	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	1.06	LB/H	EACH	4.64	T/YR	EACH
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	(4) PELLET LINE LOT BLENDER	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.72	LB/H	EACH	0.43	T/YR	EACH
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	PELLET OFFSPEC BIN	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.72	LB/H	-	0.18	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	BAGGING BIN VENT FILTER	reactor/production	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	1.08	LB/H	-	0.38	T/YR	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	Low Pressure HDPE and LLDPE solution phase plant	reactor/production	-	-	Volatile Organic Compounds (VOC)	Process vents upstream of pellet dryer controlled; dryer vents uncontrolled and emissions added to residual VOC emissions; residual VOC head space testing after dryer and at product loadout.	39.3	LB/MMLB	MONTHLY	30	LB/MMLB	ANNUAL
TX-0966	EQUSTAR LAPORTE COMPLEX	11/14/2023	RAW MATERIAL VESSEL VENTS	tanks	-	-	Volatile Organic Compounds (VOC)	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-l Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams.	-	-	-	-	0	0
IA-0084	ADM POLYMERS	11/30/2006	LAIDIG TANKS	tanks	3	T/H	Volatile Organic Compounds (VOC)	-	80	T/YR	365 DAY ROLLING TOTAL	3500	PPMD	30 DAY ROLLING AVERAGE
IA-0084	ADM POLYMERS	11/30/2006	ANTIFOAM STORAGE TANK	tanks	13000	GAL	Volatile Organic Compounds (VOC)	-	0.01	T/YR	ROLLING 12 MONTH TOTAL	-	0	0
IA-0084	ADM POLYMERS	11/30/2006	BDO STORAGE TANK	tanks	86000	GAL	Volatile Organic Compounds (VOC)	-	0.01	T/YR	ROLLING 12 MONTH TOTAL	-	0	0

Table D-1
Summary of RBLC Results - Polymer and Resin Production - VOC
Synthomer Inc. - Mogadore, OH

RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
IA-0084	ADM POLYMERS	11/30/2006	BROTH HOLDING TANKS	tanks	145000	GAL	Volatile Organic Compounds (VOC)	-	0.02	LB/H	AVERAGE OF THREE (3) 1-HR TEST RUNS	-	0	0
LA-0295	WESTLAKE FACILITY	7/12/2016	Bulk Storage Vents (RLP 5, 9, 10, 11)	tanks	1200	ACFM	Volatile Organic Compounds (VOC)	Good design and operating practices	0.01	LB/H	HOURLY MAXIMUM	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	ET1, ET2, and PR Pressure Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Maintain working pressure sufficient at all times under normal operating conditions to prevent vapor or gas loss to the atmosphere.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE1 Hexane, Low Polymer, and Oilgomer Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Routing storage vessels through a closed vent system to thermal oxidizers.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE2 Hexane, Low Polymer, and Oilgomer Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Routing storage tank through closed vent system to thermal oxidizers.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	PP Hexane Storage Tank	tanks	-	-	Volatile Organic Compounds (VOC)	Routing though a closed vent system to a thermal oxidizer or flare.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	LOG Hexane Storage Tank	tanks	-	-	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a thermal oxidizer.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	PR HC, Spent Caustic, and Wash Oil Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Routing through a closed vent system to a vapor combustor.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Pyrolysis Gasoline and Hexane Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Equip with internal floating roof.	-	-	-	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	DEG, EG, PEG, MEG, and Diesel Storage Tanks	tanks	-	-	Volatile Organic Compounds (VOC)	Storage vessels equipped with fixed roofs.	-	-	-	-	0	0
LA-0371	LAKE CHARLES CHEMICAL COMPLEX	11/7/2019	ALC Tanks (4) and Drums (9)	tanks	-	-	Volatile Organic Compounds (VOC)	Closed vent system to a flare	-	-	-	-	0	0
OH-0159	PERSTORP POLYOLS	8/24/1988	TANK, CONDENSATION	tanks	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	CATALYTIC INCINERATOR, SUBMERGED FILL	-	INCLUDED W/PROCESS	-	-	0	0
OH-0159	PERSTORP POLYOLS	8/24/1988	TANK, WATER/FORMALDEHYDE	tanks	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	CATALYTIC INCINERATOR, SUBMERGED FILL	-	INCLUDED W/PROCESS	-	-	0	0
OH-0159	PERSTORP POLYOLS	8/24/1988	TANK, BUTYRALDEHYDE	tanks	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	SUBMERGED FILL, PRESSURIZED TANK	-	NIL	-	-	0	0
OH-0159	PERSTORP POLYOLS	8/24/1988	TANK, IMP, 2	tanks	-	CONFIDENTIAL	Volatile Organic Compounds (VOC)	GLYCERINE SEAL	-	NIL	-	-	0	0
*PA-0326	SHELL POLYMERS MONACA SITE	2/18/2021	Diesel Fuel Storage Tanks 18,000 gal	tanks	-	-	Volatile Organic Compounds (VOC)	tank vents controlled by carbon canisters designed to reduce VOC emissions by a minimum 95%	-	-	-	-	0	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	EXTRUDER FEED TANK VENT	tanks	-	-	Volatile Organic Compounds (VOC)	THE VOC EMISSIONS ARE UNCONTROLLED AND ARE ESTIMATED TO BE UP TO 200 PPMV IN THE EXHAUST. THE TOTAL UNCONTROLLED EMISSIONS FOR ALL VENTS ARE 54 LB VOC/MMLB PRODUCT	0.27	LB/H	-	1.18	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	NAPHTHA TANK	tanks	-	-	Volatile Organic Compounds (VOC)	INTERNAL FLOATING ROOF AND WASTE GAS ROUTED TO A FLARE OR AN INCINERATOR. FOLLOW MAINTENANCE, LEAK DETECTION AND REPAIR PROCEDURES AS DIRECTED BY NSPS ACCORDING TO TANK CAPACITY AND PRESSURE	8.02	LB/H	-	12.96	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	WASH OIL TANK	tanks	2200	GAL/MIN	Volatile Organic Compounds (VOC)	INTERNAL FLOATING ROOF WITH WASTE GAS ROUTED TO A FLARE OR INCINERATOR. MAINTENANCE, LEAK DETECTION AND REPAIR AS DIRECTED BY NSPS ACCORDING TO CAPACITY AND PRESSURE	2.68	LB/H	-	1.38	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	ETHYLENE GLYCOL TANKS (2)	tanks	-	-	Volatile Organic Compounds (VOC)	INTERNAL FLOATING ROOF WITH WASTE GAS ROUTED TO A FLARE OR INCINERATOR. FOLLOW PROCEDURES OF MAINTENANCE, LEAK DETECTION, AND REPAIR ACCORDING TO NSPS SPECIFIED BY CAPACITY AND PRESSURE.	0.35	LB/H	-	0.27	T/YR	0
TX-0281	MARINE LOADING FACILITY	6/21/1996	C9+ CUT STORAGE TANK	tanks	2200	GAL/MIN	Volatile Organic Compounds (VOC)	INTERNAL FLOATING ROOF WITH WASTE GAS ROUTED TO A FLARE OR INCINERATOR. FOLLOW MAINTENANCE, LEAK DETECTION, ISOLATION AND REPAIR AS MANDATED BY NSPS ACCORDING TO TANK CAPACITY AND PRESSURE	2.45	LB/H	-	1.53	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	COOLING WATER ADDITIVE TANKS	tanks	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	0.01	LB/H	LESS THAN	0.01	T/YR	LESS THAN
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	Storage tanks content vapor pressure less than 0.5 psia	tanks	-	-	Volatile Organic Compounds (VOC)	FLARE	-	-	-	-	0	0
TX-0863	POLYETHYLENE 7 FACILITY	9/3/2019	Storage tanks content vapor pressure greater than or equal to 0.5 psia	tanks	-	-	Volatile Organic Compounds (VOC)	IFR AND FLARE	-	-	-	-	0	0

Table D-1
Summary of RBLC Results - Polymer and Resin Production - VOC
Synthomer Inc. - Mogadore, OH

RBLCID	FACILITY NAME	PERMIT ISSUANCE DATE	PROCESS NAME	PROCESS TYPE	THROUGHPUT	UNITS	POLLUTANT	CONTROL METHOD	EMISSION LIMIT 1	UNITS	TIME CONDITION	EMISSION LIMIT 2	UNITS	TIME CONDITION
TX-0901	EQUISTAR CHEMICALS LA PORTE COMPLEX	11/6/2020	MSS Vessel Clearing to Atmosphere	tanks	-	-	Volatile Organic Compounds (VOC)	Best practices. Purging/clearing with nitrogen to boiler or flare control, then venting of VOC at a concentration of no more than 10,000 ppmv.	-	-	-	-	0	0
TX-0945	FORMOSA POINT COMFORT PLANT OL3	4/6/2023	STORAGE TANKS	tanks	-	-	Volatile Organic Compounds (VOC)	Controlled by existing elevated flares and cross piping new enclosed ground flares	-	-	-	-	0	0
TX-0966	EQUSTAR LAPORTE COMPLEX	11/14/2023	LARGE EQUIPMENT AND VESSEL PURGING	tanks	-	-	Volatile Organic Compounds (VOC)	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-l Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams. Equipment is purged with nitrogen, isolated, and the VOC concentration is reduced to less than 10,000 ppmv before the equipment is opened to the atmosphere.	-	-	-	-	0	0
VA-0050	VIRGINIA CHEMICALS, INC.	12/5/1986	TANK, ACID, #23 24	tanks	-	-	Volatile Organic Compounds (VOC)	-	0.13	LB/H TOTAL	-	0.6	T/YR TOTAL	0
CT-0118	DOW CHEMICAL USA	12/5/1988	SOCMI STORAGE VESSELS	tanks	10000	GAL	Volatile Organic Compounds (VOC)	GOOD ENGINEERING PRACTICES	-	SEE P2	-	-	0	0
IA-0084	ADM POLYMERS	11/30/2006	PELLET BLENDING SILOS	tanks	1800	CF	Volatile Organic Compounds (VOC)	-	80	T/YR	365 DAY ROLLING TOTAL	3500	PPMD	30 DAY ROLLING AVERAGE
IA-0084	ADM POLYMERS	11/30/2006	PELLET STORAGE BIN	tanks	7550	CF	Volatile Organic Compounds (VOC)	-	0.12	LB/H	AVERAGE OF THREE (3) 1-H TEST RUNS	-	0	0
LA-0296	LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	5/23/2014	Bin B208 Vent (EQT 667)	tanks	-	-	Volatile Organic Compounds (VOC)	-	0.04	LB/HR	HOURLY MAXIMUM	0.15	TPY	ANNUAL MAXIMUM
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	RESIN BINS NOS. 101, 102, AND 103	tanks	-	-	Volatile Organic Compounds (VOC)	PURGING IN THE BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 1	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	RESIN BINS NOS. 201, 202, AND 203	tanks	-	-	Volatile Organic Compounds (VOC)	PURGING IN THE BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 2	-	0	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	FLASH TANK CLEANOUT SCREEN	tanks	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED.	2.3	LB/H	-	0.14	T/YR	0
TX-0272	FORMOSA- HIGH DENSITY POLYETHYLENE II	9/8/1999	PELLET BLENDING AND STORAGE	tanks	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED. THE TOTAL PELLET EMISSIONS ARE LESS THAN 50 PPMW.	1.38	LB/H	-	6.05	T/YR	0
TX-0378	LA PORTE POLYPROPYLENE PLANT	11/5/2001	(4) CARLOT SILO BLENDERS	tanks	-	-	Volatile Organic Compounds (VOC)	NONE INDICATED	1.08	LB/H	EACH	0.38	T/YR	EACH
IA-0084	ADM POLYMERS	11/30/2006	POLYMER POWDER CONVEYING	transfer	5	T/H	Volatile Organic Compounds (VOC)	-	80	T/YR	365 DAY ROLLING TOTAL	3500	PPMW	30 DAY ROLLING AVERAGE
IA-0084	ADM POLYMERS	11/30/2006	EXTRUDER VACUUM PUMP	transfer	300	ACFM	Volatile Organic Compounds (VOC)	-	0.03	LB/H	AVERAGE OF THREE (3) 1-H TEST RUNS	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	HDPE1, HDPE2, PP, LDPE, LLDPE Downstream Pellet Handling	transfer	-	-	Volatile Organic Compounds (VOC)	Limit the VOC content of the individual vent streams to no more than 0.10 percent by weight.	0.1	% BY WEIGHT	-	-	0	0
TX-0268	LOW PRESSURE POLYETHYLENE PLANT NO. 2	3/6/1997	P1 FEED HOPPER FILTER	transfer	-	-	Volatile Organic Compounds (VOC)	PURGING IN THE BINS UPSTREAM REMOVES >95% OF ENTRAINED VOC.	-	-	SEE COMBINED ENTRY NO. 1	-	0	0
LA-0364	FG LA COMPLEX	1/6/2020	Wastewater Treatment System	wastewater	-	-	Volatile Organic Compounds (VOC)	Good design and venting the emissions to a control device in the primary treatment system enters the biological treatment unit.	-	-	-	-	0	0
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	12/21/2018	Wastewater Collection and Treatment (P806)	wastewater	-	-	Volatile Organic Compounds (VOC)	i. Use an enhanced biodegradation unit to maintain the annual benzene quantity from facility waste at less than 10 megagrams (MG; 11 tons) by combining waste streams with greater than 10 ppmw benzene with waste streams with less than 10 ppmw benzene to form a combined waste stream with a benzene concentration less than 10 ppmw; ii. Route emissions from wastewater generated in the ethylene manufacturing process to a thermal oxidizer designed to achieve >99.5% destruction efficiency for volatile organic compounds (VOC); iii. Cover and route emissions from the process wastewater equalization tank (T-6503), the waste oil drum (T-6502), the oily wastewater storage tank (T-6501) and the wet air oxidation unit to a thermal oxidizer designed to achieve >99.5% destruction efficiency for VOC; iv. Emissions from wastewater generated in the high-density polyethylene units must comply with the applicable requirements of 40 CFR Part 63,	0.01	LB/H	-	0.02	T/YR	PER ROLLING 12 MONTH PERIOD
OK-0112	MUSKOGEE MILL	3/27/2006	NEW PLATE WASHER/MAKING	washer	-	-	Volatile Organic Compounds (VOC)	WASHER INHERENT DESIGN	1.4	T/YR	-	-	0	0

APPENDIX E -
RTO STACK TEST REPORT

SOURCE TEST REPORT
2021 COMPLIANCE EMISSIONS TESTING

OMNOVA SOLUTIONS INC., A SYNTHOMER COMPANY
MOGADORE, OHIO

POLY/DEGAS PROCESS (P004)

Prepared For:

OMNOVA Solutions Inc., a Synthomer Company
165 S Cleveland Ave,
Mogadore, OH 44260

For Submittal To:

Akron Regional Air Quality Management District
1867 W. Market Street
Akron, OH 44313

Prepared By:

Montrose Air Quality Services, LLC
10060 Brecksville Road
Brecksville, OH 44141

Document Number:	**MW011AS-008887-RT-722**
Test Date:	**June 8, 2021**
Submittal Date:	**June 22, 2021**

STAC
STACK TESTING ACCREDITATION COUNCIL

ACCREDITED
TO ASTM D7036 ONLY
CERT #3925.01

MONTROSE
AIR QUALITY SERVICES

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: ______________________ Date: 06 / 22 / 2021

Name: Robert H. Sava, Jr. 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: robert j lisy jr Date: 06 / 21 / 2021

Name: Robert J. Lisy, Jr. Title: District Manager

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1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

OMNOVA Solutions Inc., a Synthomer Company (OMNOVA) (Facility ID: 16-67-00-0007) contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance test program on the Poly/Degas Process (P004) at the OMNOVA facility located in Mogadore, Ohio. Testing was performed on June 8, 2021, for the purpose of satisfying the emission testing requirements pursuant to Ohio Environmental Protection Agency (Ohio EPA) Title V Permit No. P0115761.

The specific objectives were to:

- Verify the emissions of total gaseous organic compounds (TGO) and TGO destruction efficiency (DE) of the thermal oxidizer (T-OX) serving P004
- 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)
6/8/2021	P004 T-OX Inlet Duct	Velocity/Volumetric Flow Rate	EPA 2D	3	60-75
6/8/2021	P004 T-OX Inlet Duct	TGO	EPA 25A	3	60
6/8/2021	P004 T-OX Exhaust Stack	Velocity/Volumetric Flow Rate	EPA 1, 2	3	8-13
6/8/2021	P004 T-OX Exhaust Stack	O2, CO2	EPA 3	3	60
6/8/2021	P004 T-OX Exhaust Stack	Moisture	EPA 4	3	60
6/8/2021	P004 T-OX Exhaust Stack	TGO	EPA 25A	3	60

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

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 Table 1-2. 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 1-3. The tests were conducted according to the Intent-to-Test notification dated April 29, 2021 that was submitted to ARAMDAQ.

TABLE 1-2
SUMMARY OF AVERAGE COMPLIANCE RESULTS -
POLY/DEGAS (P004)
JUNE 8, 2021

Parameter/Units	Average Results	Emission Limits
Total Gaseous Organic Compounds (TGO)		
lb/hr, as methane	0.019	5.31
Destruction Efficiency (DE), %	99.95	98

1.2 KEY PERSONNEL

A list of project participants is included below:

Facility Information

Source Location:	OMNOVA Solutions Inc., A Synthomer Company 165 S Cleveland Ave. Mogadore, OH 44260
Project Contact:	Doug Oblak
Role:	SHES Sr. Specialist
Company:	OMNOVA Solutions Inc.
Telephone:	330-628-6443
Email:	doug.oblak@synthomer.com

Agency Information

Regulatory Agency:	Akron Regional Air Quality Management District
Agency Contact:	Kelly Kanoza
Telephone:	330-812-3954
Email:	kkanoza@schd.org

Testing Company Information

Testing Firm:	Montrose Air Quality Services, LLC	
Contact:	Robert J. Lisy, Jr.	Robert H. Sava, Jr.
Title:	District Manager	Client Project Manager
Telephone:	440-262-3760	440-262-3760
Email:	rlisy@montrose-env.com	rsava@montrose-env.com

Test personnel and observers are summarized in Table 1-3.

TABLE 1-3
TEST PERSONNEL AND OBSERVERS

Name	Affiliation	Role/Responsibility
Robert H. Sava, Jr.	Montrose	Client Project Manager, QI
Jeremiah Hicks	Montrose	Client Project Manager, QI
Jonathan Grech	Montrose	Senior Field Technician, QI
Matthew McDivitt	Montrose	Field Technician, QI
Doug Oblak	OMNOVA	Observer/Client Liaison/Test Coordinator

2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION, OPERATION, AND CONTROL EQUIPMENT

OMNOVA is a performance chemical manufacturing facility and pilot plant. The facility operates a Latex and Resin Polymerication & Degassing Process (Poly/Degas) (P004) that was in operation during this test event.

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.)	
P004 T-OX Inlet Duct	~3	--	--	Flow: Orifice; Gaseous: 1
P004 T-OX Exhaust Stack	44.1 x 44.4	108.0/2.4	281.0/6.3	Flow: 16 (8/port); Gaseous: 1

The sampling locations at the P004 T-OX Exhaust Stack 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 Appendix A.1 for more information.

2.3 OPERATING CONDITIONS AND PROCESS DATA

Emission tests were performed while the P004 and the T-OX were operating at the conditions required by the permit. P004 was tested when operating at or near maximum capacity.

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 parameter:

- Batch weight, lb

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 TEST METHODS

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.

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

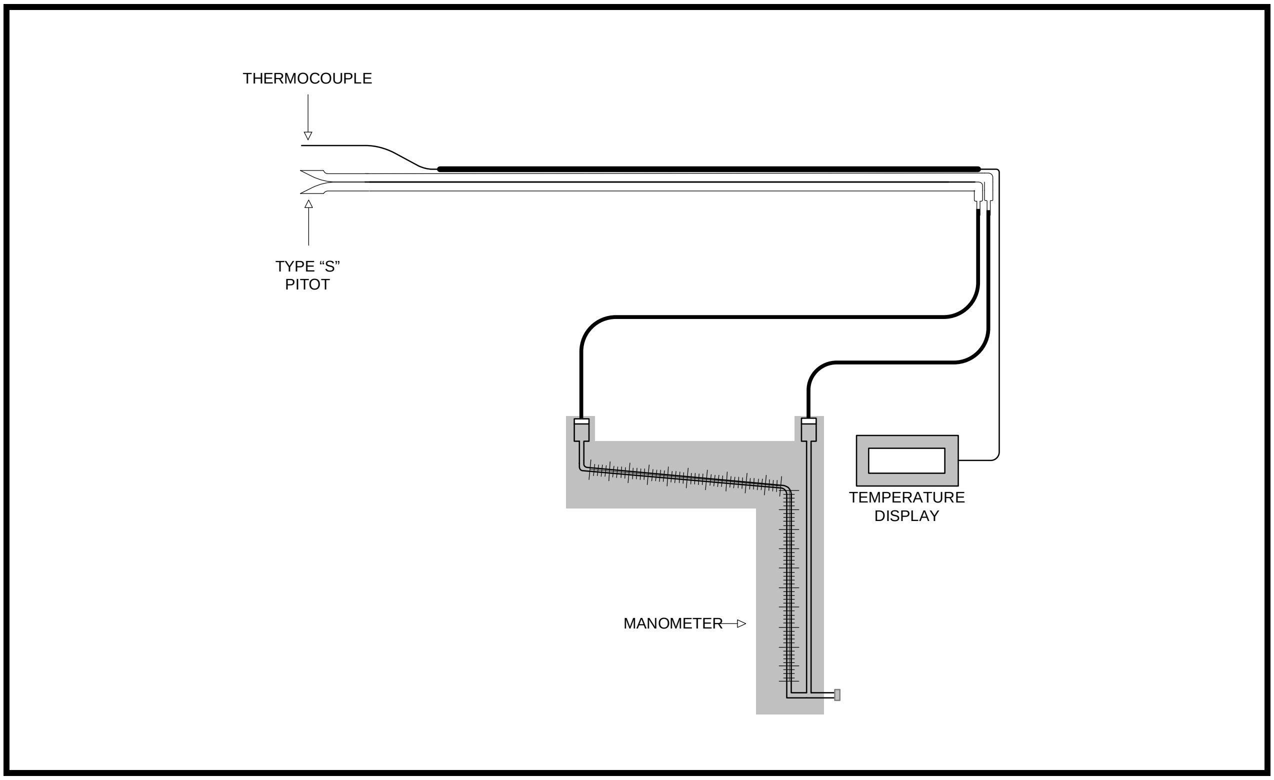
EPA Method 2 is used to measure the gas velocity using an S-type pitot tube connected to a pressure measurement device, and to measure the gas temperature using a calibrated thermocouple connected to a thermocouple indicator. Typically, Type S (Stausscheibe) pitot tubes conforming to the geometric specifications in the test method are used, along with an inclined manometer. The measurements are made at traverse points specified by EPA Method 1.

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

3.1.3 EPA Method 2D, Measurement of Gas Volume Flow Rates in Small Pipes and Ducts

EPA Method 2D is used to determine the volumetric flow rate of gas streams with small cross-sectional diameters. All gas flow in the pipe or duct is directed through a rotameter, orifice plate, or similar device to measure flow rate or pressure drop. The device is pre-calibrated in a manner that ensures its proper calibration for the gas being measured. Absolute temperature and pressure measurements are made to allow correction of volumetric flow rates to standard conditions.

FIGURE 3-1
EPA METHOD 2 SAMPLING TRAIN



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

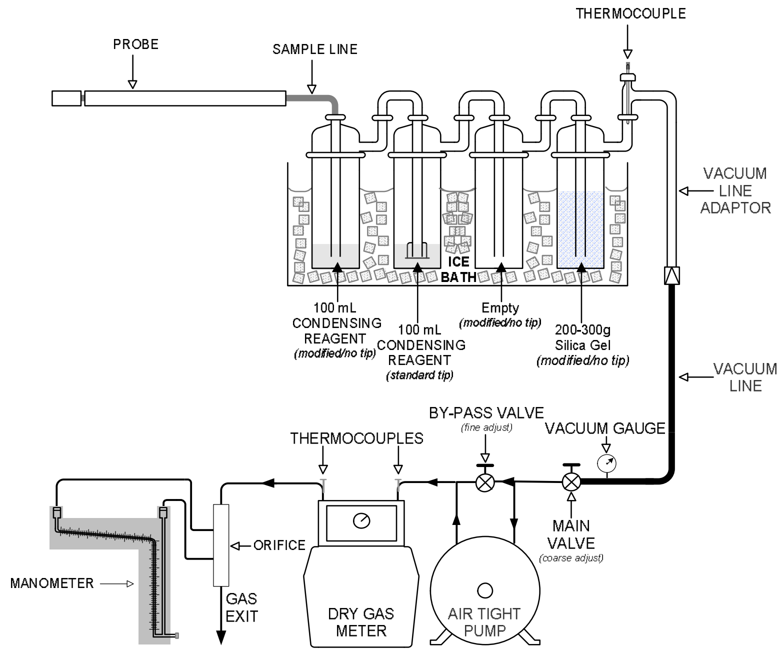
EPA Method 3 is used to calculate the dry molecular weight of the stack gas using one of three methods. The first choice is to measure the percent O_2 and CO_2 in the gas stream. A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO_2 and percent O_2 using either an Orsat or a Fyrite analyzer.

3.1.5 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 3-2.

FIGURE 3-2
EPA METHOD 4 SAMPLING TRAIN



3.1.6 EPA Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer

EPA Method 25A is an instrumental test method used to measure the concentration of THC in stack gas. A gas sample is extracted from the source through a heated sample line and glass fiber filter to a flame ionization analyzer (FIA). Results are reported as volume concentration equivalents of the calibration gas or as carbon equivalents.

The typical sampling system is detailed in Figure 3-3 (P004 Inlet Duct) and Figure 3-4 (P004 Exhaust Stack).

FIGURE 3-3
EPA METHOD 25A SAMPLING TRAIN

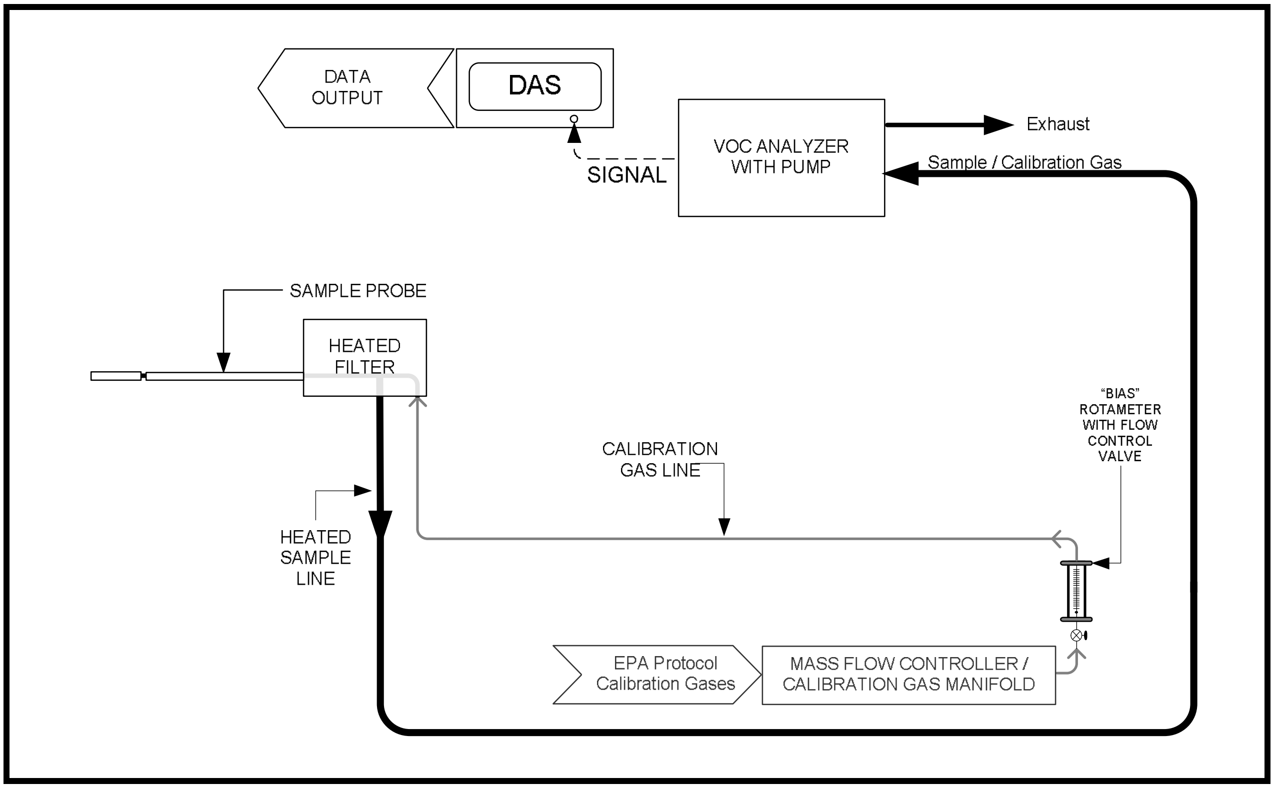
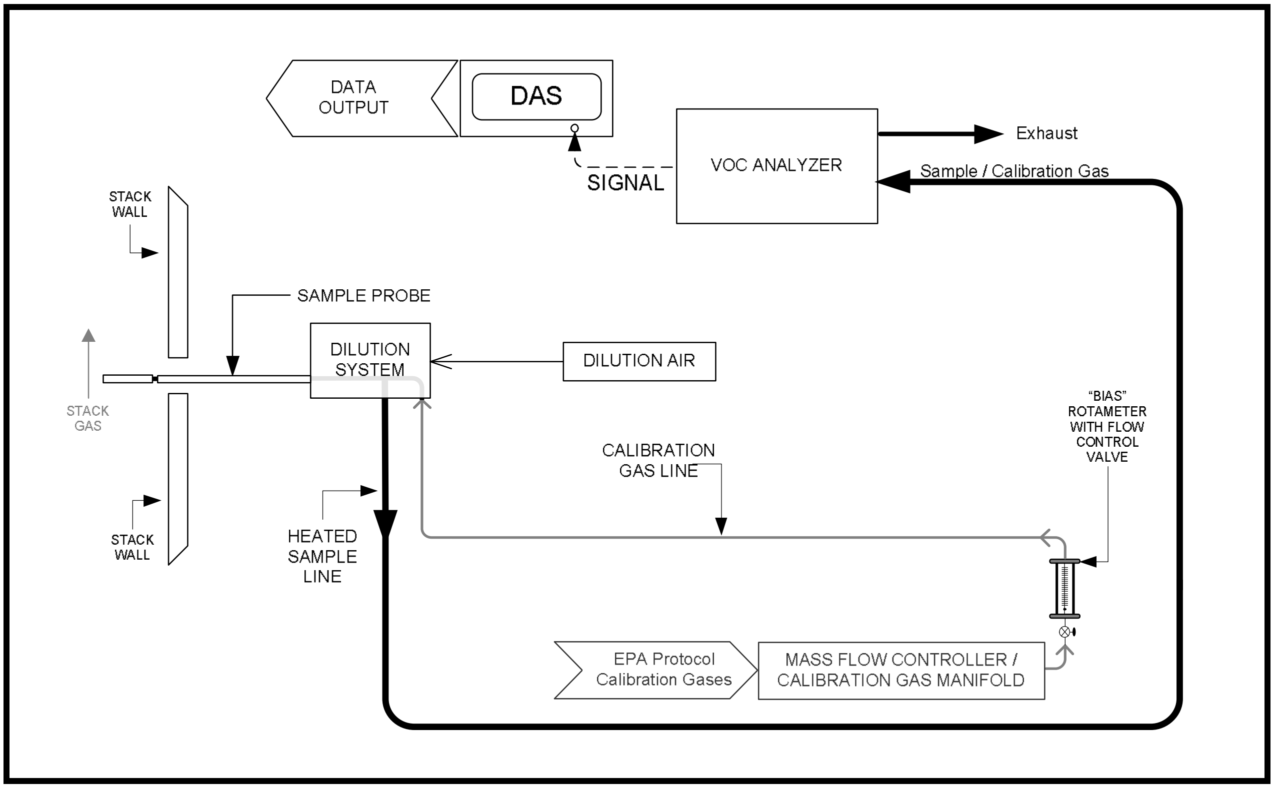


FIGURE 3-4
EPA METHOD 25A (DILUTION SYSTEM) SAMPLING TRAIN



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

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 Table 1-2. 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.

Flow (acfm) at the P004 T-OX Inlet Duct was calculated utilizing a facility installed calibrated pressure differential orifice plate. A three point calibration of the orifice plate yielded the following equation for determining acfm (utilizing Run 1 as an example):

$$\text{acfm} = 9803.6 * \Delta p_{avg}^{0.5311} / 60$$

$$118.20 \text{ acfm} = 9803.6 * 0.54^{0.5311} / 60$$

TABLE 4-1
TGO EMISSIONS RESULTS -
P004 T-OX INLET DUCT

Run Number	1	2	3	Average
Date	6/8/2021	6/8/2021	6/8/2021	--
Time	9:30-10:46	11:07-12:07	12:30-13:30	--
Flue Gas Parameters				
flue gas temperature, °F	162.9	164.1	163.9	163.6
volumetric flow rate, acfm	118.2	126.3	112.3	118.9
volumetric flow rate, scfm	96.5	103.2	91.8	97.2
Total Gaseous Organic Compounds (TGO), as methane				
ppmvw	186,751	161,621	112,610	153,661
lb/hr	45.10	41.71	25.86	37.56

TABLE 4-2
TGO EMISSIONS AND DE RESULTS -
P004 T-OX EXHAUST STACK

Run Number	1	2	3	Average
Date	6/8/2021	6/8/2021	6/8/2021	--
Time	9:30-10:46	11:07-12:07	12:30-13:30	--
Process Data				
batch weight, lb	79,931	79,010	77,836	78,926
Flue Gas Parameters				
O_2, % volume dry	12.3	12.8	12.3	12.5
CO_2, % volume dry	5.0	4.9	4.7	4.9
flue gas temperature, °F	1477.3	1454.2	1426.2	1452.5
moisture content, % volume	19.12	18.96	19.85	19.31
volumetric flow rate, scfm	2,180	1,822	1,577	1,860
Total Gaseous Organic Compunds (TGO), as methane				
ppmvw	5.675	3.452	2.493	3.873
lb/hr	0.031	0.016	0.010	0.019
TGO Destruction Efficiency (DE)				
%	99.93	99.96	99.96	99.95

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, met the applicable QA/QC criteria.

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

EPA Method 25A FIA calibration audits were within the measurement system performance specifications for the calibration drift checks and calibration error checks

An EPA Method 205 field evaluation of the calibration gas dilution system was conducted. The dilution accuracy and precision QA specifications were met.

5.2 QA/QC DISCUSSION

All QA/QC criteria were met during this test program.

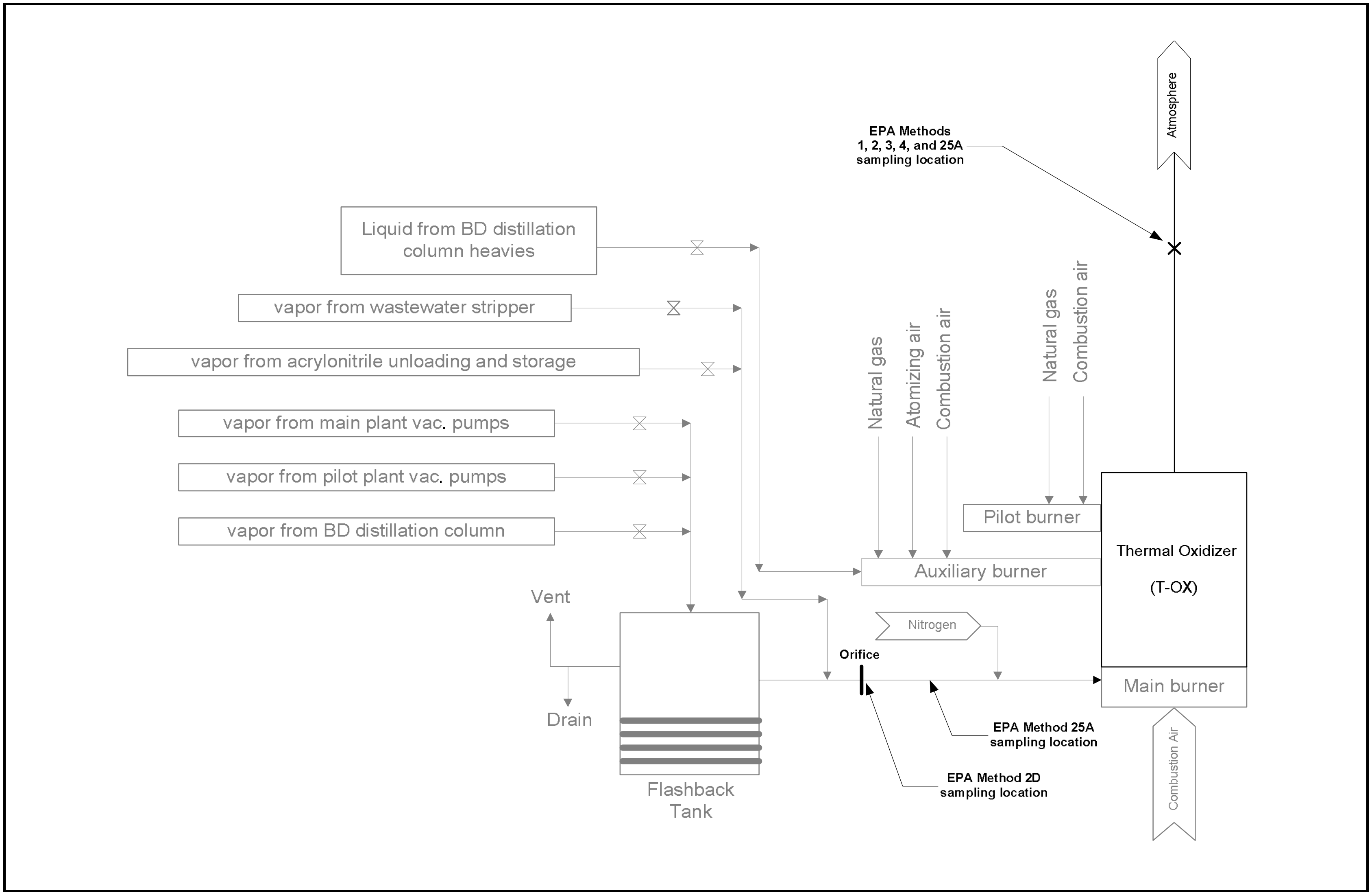
5.3 QUALITY STATEMENT

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).

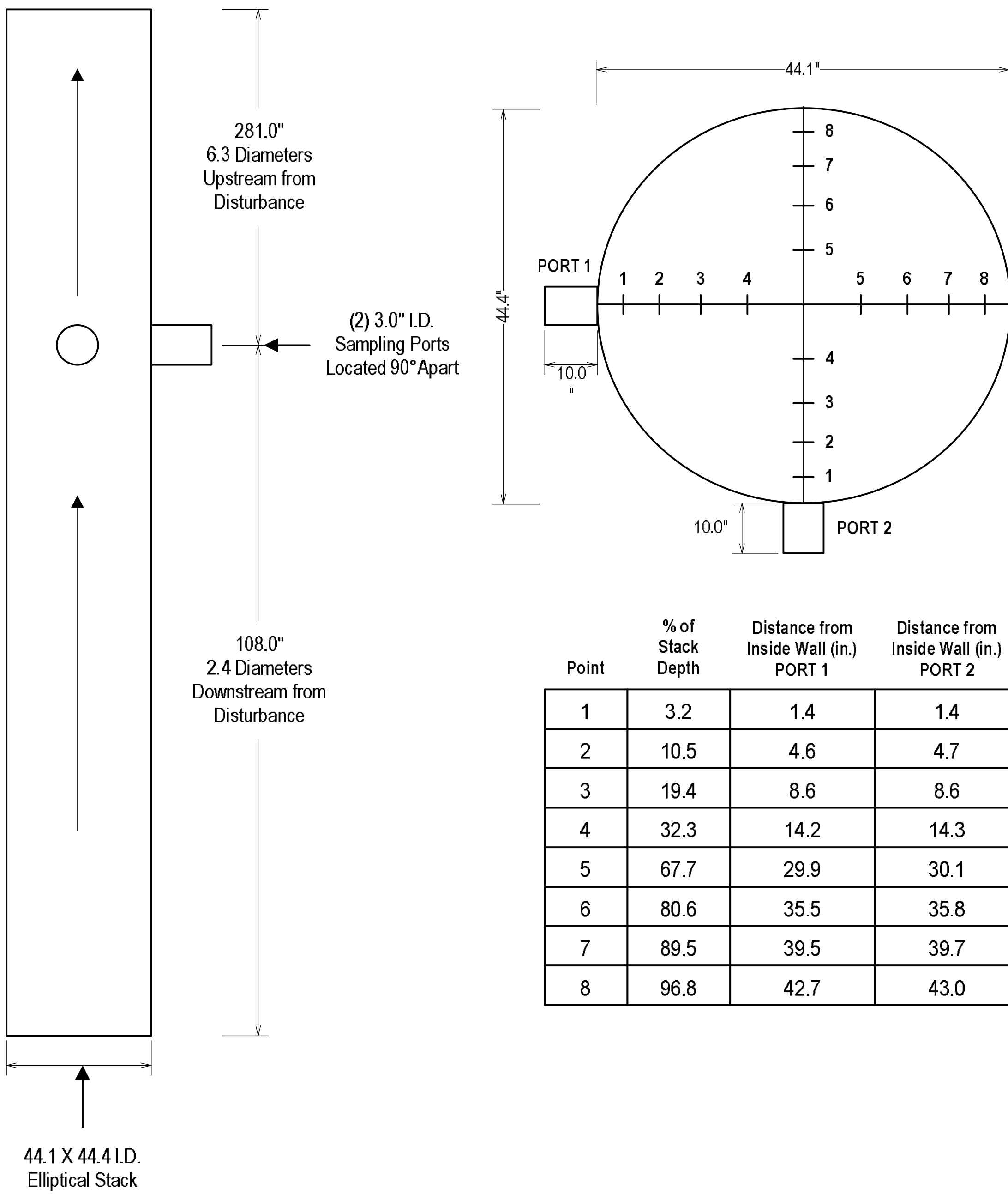
APPENDIX A
FIELD DATA AND CALCULATIONS

Appendix A.1
Sampling Locations

P004 PROCESS AND SAMPLING LOCATION SCHEMATIC



P004 EXHAUST TRAVERSE POINT LOCATION DRAWING



Point	% of Stack Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 2
1	3.2	1.4	1.4
2	10.5	4.6	4.7
3	19.4	8.6	8.6
4	32.3	14.2	14.3
5	67.7	29.9	30.1
6	80.6	35.5	35.8
7	89.5	39.5	39.7
8	96.8	42.7	43.0

Appendix A.2
P004 T-OX Inlet Field Data

TEST DATA

	Run 1	Run 2	Run 3	Average
Number of Test Runs	3			
Traverse Points	16			
Barometric Pressure at Ground Level (Pbar) (mmHg)	733	733	733	733
Barometric Pressure at Ground Level (Pbar) (in Hg)	28.86	28.86	28.86	28.86
Elevation Difference Between Ground Level and Meter Box Locations (ft)	3.00	3.00	3.00	3.00
Elevation Difference Between Ground Level and Sampling Locations (ft)	3.00	3.00	3.00	3.00
Total Sampling Run Time (Theta) (min)	75	60	75	70
Test Run Start Time (hrmin)	6/8/2021 9:30	6/8/2021 11:07	6/8/2021 12:30	
Test Run Stop Time (hrmin)	6/8/2021 10:46	6/8/2021 12:07	6/8/2021 13:30	

DETAILED RESULTS

Stack Gas Conditions	Run 1	Run 2	Run 3	Average
Barometric Pressure at Sampling Location (in Hg)	28.85	28.85	28.85	28.85
Dry Molecular Weight of Stack Gas (Md) (lb/lb-mole)	29.00	29.00	29.00	29.00
Average Absolute Stack Gas Pressure (Ps) (in Hg)	28.89	28.93	28.96	28.92
Average Stack Gas Static Pressure (ps) (in H2O)	0.45	1.05	1.38	0.96
Average Stack Gas Temperature (ts) (°F)	162.9	164.1	163.9	163.6
Average Stack Gas Temperature (Ts) (°R)	622.9	624.1	623.9	623.6
Wet Volumetric Stack Gas Flow at Actual Conditions (Qaw) (acfm)	118.2	126.3	112.3	118.9
Wet Volumetric Stack Gas Flow at Standard Conditions (scfm)	96.7	103.3	91.9	97.3

Test Results	Run 1	Run 2	Run 3	Average
Average Velocity Pressure (Delta P) (in H2O)	0.54	0.62	0.49	0.55
Average Square Root of Delta P	0.72	0.77	0.68	0.73

MEASURED DATA FROM TEST RUNS

Point Count	Run #	Pitot Delta P (in H2O)	Square Root of Delta P	Stack Pressure (in H2O)	Stack Temp (°F)
1	1	**0.4564**	0.676	**0.4495**	**167**
2	1	**0.9860**	0.993		**168**
3	1	**0.1985**	0.446		**157**
4	1	**1.1150**	1.056		**150**
5	1	**0.5095**	0.714		**149**
6	1	**0.7415**	0.861		**147**
7	1	**0.4545**	0.674		**162**
8	1	**0.4170**	0.646		**164**
9	1	**0.3825**	0.618		**167**
10	1	**0.5060**	0.711		**164**
11	1	**0.4320**	0.657		**166**
12	1	**0.5420**	0.736		**169**
13	1	**0.3800**	0.616		**166**
14	1	**0.4525**	0.673		**170**
15	1	**0.5230**	0.723		**170**
16	1	**0.6005**	0.775		**171**
17	2	**0.4575**	0.676	**1.05**	**170**
18	2	**0.6365**	0.798		**168**
19	2	**0.2210**	0.470		**165**
20	2	**0.5880**	0.767		**161**
21	2	**1.2100**	1.100		**151**
22	2	**1.1800**	1.086		**155**
23	2	**0.6400**	0.800		**162**
24	2	**0.5790**	0.761		**164**
25	2	**0.6230**	0.789		**163**
26	2	**0.5710**	0.756		**166**
27	2	**0.4225**	0.650		**169**
28	2	**0.4225**	0.650		**169**
29	2	**0.4600**	0.678		**170**
30	2				
31	2				
32	2				
33	3	**0.7420**	0.861	**1.38**	**164**
34	3	**0.6700**	0.819		**165**
35	3	**0.3840**	0.620		**137**
36	3	**1.1800**	1.086		**155**
37	3	**0.5060**	0.711		**156**
38	3	**0.1753**	0.419		**157**
39	3	**0.2405**	0.490		**162**
40	3	**0.2885**	0.537		**172**
41	3	**0.3520**	0.593		**172**
42	3	**0.5020**	0.709		**169**
43	3	**0.5455**	0.739		**170**
44	3	**0.5485**	0.741		**170**
45	3	**0.2735**	0.523		**167**
46	3	**0.5051**	0.711		**168**
47	3	**0.4330**	0.658		**166**
48	3	**0.5495**	0.741		**172**

TEST DATA - EPA Method 25A

Number of Concentration Runs	3

Analyzer Calibration

	Run 1	Run 2	Run 3	Average
Actual Concentration of the Low-Level Calibration Gas (%)	9.00	9.00	9.00	9.00
Actual Concentration of the Mid-Level Calibration Gas (%)	15.00	15.00	15.00	15.00
Actual Concentration of the High-Level Calibration Gas (%)	26.00	26.00	26.00	26.00
Analyzer Span During Test Run (%)	30.00	30.00	30.00	30.00
Calibration Gas QA	GOOD	GOOD	GOOD	
Initial Analyzer Calibration Response for Zero Gas (%)	0.00	0.00	0.00	0.00
Initial Analyzer Calibration Response for Low-Level Gas (%)	9.28	9.28	9.28	9.28
Initial Analyzer Calibration Response for Mid-Level Gas (%)	15.16	15.16	15.16	15.16
Initial Analyzer Calibration Response for High Level Gas (%)	26.01	26.01	26.01	26.01
Final Analyzer Calibration Response for Zero Gas (%)	0.01	0.01	0.02	0.01
Final Analyzer Calibration Response for Mid-Level Gas (%)	15.29	15.25	15.40	15.31

Analyzer Calibration QA

	Run 1	Run 2	Run 3	Average
Analyzer Span During Test Run (ppmv as Carbon)	90	90	90	90
Zero Drift (% of Span)	0.03	0.03	0.07	0.04
Calibration Drift for Mid-Level Cal. Gas (% of Span)	0.43	0.30	0.80	0.51
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-3.11	-3.11	-3.11	-3.11
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-1.07	-1.07	-1.07	-1.07

DETAILED RESULTS

Emission Results

	Run 1	Run 2	Run 3	Average
Average TGO (VOC) Mass Emission Rate as Methane, (lb/hr)	45.1021	41.7105	25.8572	37.5566

CONCENTRATION CALCULATIONS

Average Effluent Total Gaseous Organic (TGO) Concentration

	Run 1	Run 2	Run 3	Average
Cmeas = Average Organic Concentration as Measured by Gas Analyzer as Propane (ppmvw)	62250	53874	37537	51220.23
K= Methane Equivalent Correction Factor for Propane	3	3	3	3
Cc= Average Total Gaseous Organic Concentration Measured as Methane (ppmvw)	186751.37	161621.09	112609.60	153660.69

Method 2D.xls Field Data Sheet

Plant Name OMNOVA					
City, State Mogadore, OH					
Location T-OX Inlet					
Barometer ID * ~~C-DPG-~~	C-BAR-002	Thermometer ID	T-M2U-501	Run Number	1
Initial Barometric Pressure (mmHg)	733	Final Barometric Pressure (mmHg)	733	Calibration Date	* "
Metering Device No.	T-MIC-003	Metering Device Mfr.	* "	Calibration Coef.	* "
Totalizer Device No.	* "	Totalizer Device Mfr.	* "	Ambient Temperature (°F)	75
Start Time	9:30	Finish Time	~~10:30~~ 10:45 *		

Test Point	Run Time (min)	in H_2O Flow Rate of Orifice Plate ~~(cfm)~~* *	Stack Temp ~~Totalizer Reading~~ *	Event	Stack Temp (F)	Static Pressure (in. H2O)
1	(9:30) 0	0.4564	167	9:30 start	—	0.4495
2	5	0.9860	168			
3	10	0.1985	157			
4	15	~~2~~1.115	150			
5	20	0.5095	149	(+) 0.4495		
6	25	0.7415	147	~~(-) 0.0485~~ *		
7	30	0.4545	162			
8	35	0.4170	164			
9	40	0.3825	167			
10	45	0.5060	164			
11	50	0.4320	166			
12	55	0.5420	169			
13	60	0.3800	166			
14	65	0.4525	170			
15	70	0.5236	170			
16	75	0.6005	171			
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31				* " see cal sheet		
32						

* JG 6.8.21

Job Number: 008887
Done By / Date: JG / 6.8.21
Final Check By / Date: JH / 6-8-21

Method 2D.xls Field Data Sheet

Plant Name OMNOVA		
City, State Mogadore, OH		
Location T-OX Inlet		
Barometer ID T - DPG - C-BAR-002	Thermometer ID T - M2U-501	Run Number 2
Initial Barometric Pressure (mmHg) 733	Final Barometric Pressure (mmHg) 733	Calibration Date *"
Metering Device No. T-MK-003	Metering Device Mfr. *"	Calibration Coef. *"
Totalizer Device No. See cal sheet	Totalizer Device Mfr. *"	Ambient Temperature (°F) 80
Start Time 11:07	Finish Time 12:07	

Test Point	Run Time (min)	ΔP Flow Rate of Orifice Plate (~~cfm~~)*	Stack temp ~~Totalizer~~ * ~~Reading~~	Event	Stack Temp (F)	Static Pressure (in. H2O)
1	0	0.4575	170		—	1.050
2	5	0.6365	168			
3	10	0.2210	165			
4	15	0.5880	161			
5	20	1.210	151	~~(-) +0.0825~~ *		
6	25	1.180	155			
7	30	0.6400	162			
8	35	0.5790	164			
9	40	0.6230	163			
10	45	0.5710	166			
11	50	0.4225	169			
12	55	0.4225	169			
13	60	0.4600	170			
14						
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27						
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29						
30						
31				*" see cal sheet		
32						

* JG 6.8.21

Job Number: 008887
Done By / Date: JG / 6.8.21
Final Check By / Date: JH / 6-9-21

Method 2D.xls Field Data Sheet

Plant Name OMNOVA		
City, State Mogadore, OH		
Location T-OX Inlet		
Barometer ID T - DPG - C-BAR-002	Thermometer ID T - M2U-501	Run Number 3
Initial Barometric Pressure (mmHg) 733	Final Barometric Pressure (mmHg) 733	Calibration Date see cal. sheet
Metering Device No. See cal. Sheet	Metering Device Mfr. See cal. Sheet	Calibration Coef. see cal. sheet.
Totalizer Device No. See cal. Sheet.	Totalizer Device Mfr. see cal. sheet.	Ambient Temperature (°F) 80
Start Time 12:23	Finish Time 13:38	

Test Point	Run Time (min)	ΔP Flow Rate of Orifice Plate ~~(cfm)~~* *	Stack temp ~~Totalizer Reading~~ *	Event	Stack Temp (F)	Static Pressure (in. H2O)
1	0	0.7420	164		-	x 1.380 *
2	5	0.6700	165			
3	10	0.3840	167			
4	15	* x 1.180	155			
5	20	0.5060	156			
6	25	* a 0.1755	157			
7	30	0.2405	162			
8	35	0.2885	172			
9	40	0.3520	172			
10	45	0.5020	169			
11	50	0.5455	170			
12	55	0.5485	170			
13	60	0.2735	167			
14	65	0.5051	168			
15	70	0.4330	166			
16	75	0.5495	172			
17						
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32						

* JG 6.8.21

Job Number: 008887
Done By / Date: JG / 6.8.21
Final Check By / Date: JH / 6-9-21

Effective Date: 12/19/2018
Rev No. 6
Issued by: District Manager

CEMS RATA Field Data

Company Name: OMNOVA | In-Stack Filter (Y/N): N | Sample Line ID(s): T-HSL-114, 502

Location: T-OX I/O | CEM Probe ID: T-CPR- INC. | HSL Temp Ctrl ID(s): T-TMP-T6 1, 2, 3

Probe Temp Ctrl ID: T-TMP- — | Sample Cond ID(s): T-SCU- —

DAQ Computer ID: DARLAPTOP | CEMS Filter: T-PSP- 005 | Calibration Gas Diluter: T-CGD- 001

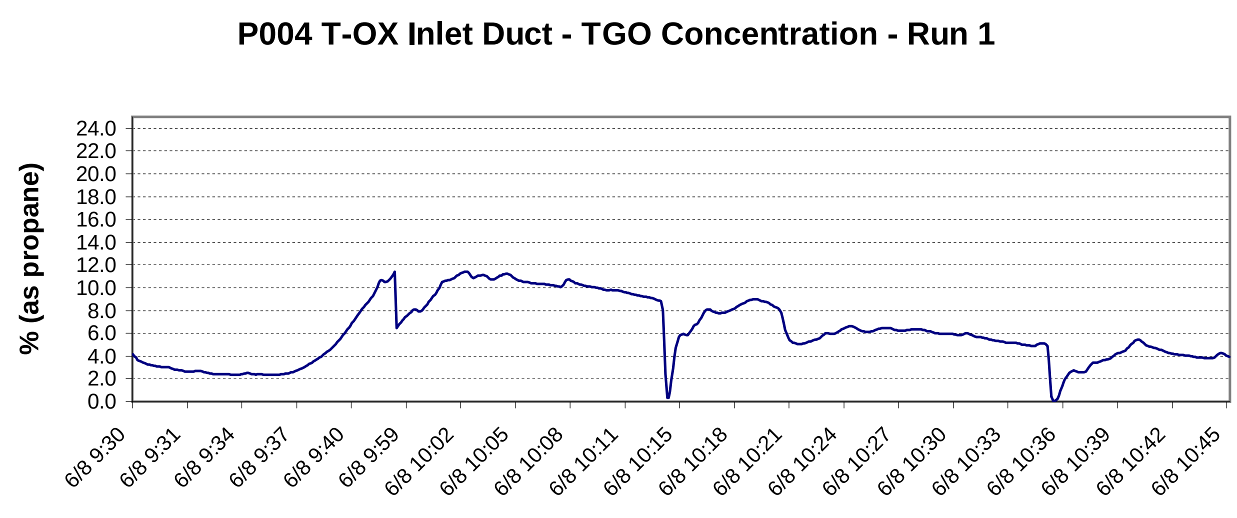
	Inlet	Exhaust						
Analyzer ID(s):	T- FID-021	T- FID-024	T-	T-	T-	T-	T-	T-
Model Number:	700	700						
Span(s) (ppm / %):	10%	90PPM						
DAQ Data Column:	1	2						
Primary / Back-Up:	P	P						
Dilution Ratio:	30:1	N/A						
Sample Type (wet/dry):	WET	WET						
Number of Traverse Points:	1	1						

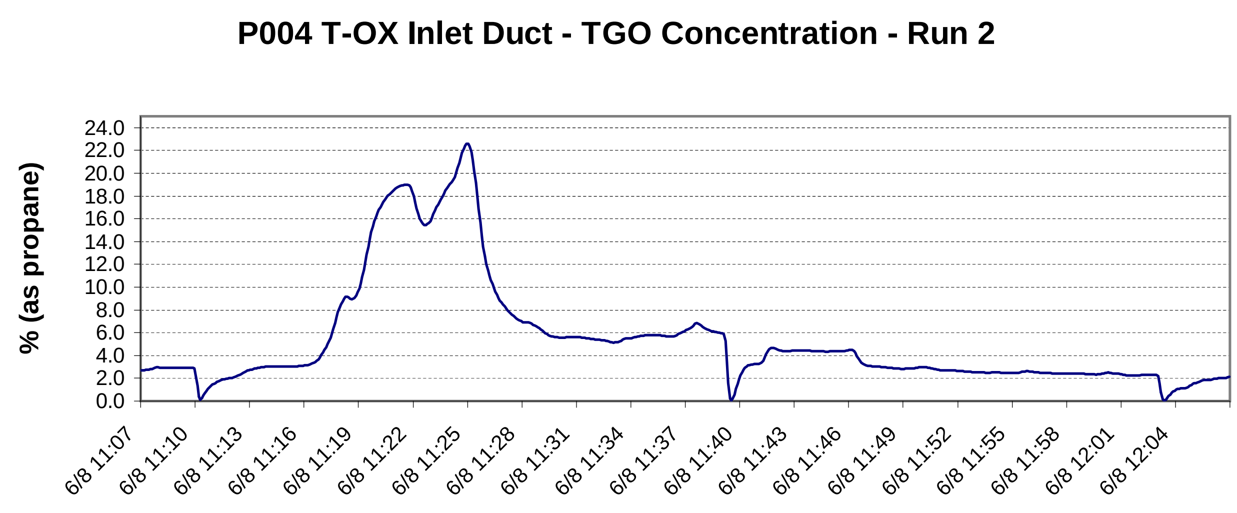
Run		DAQ Time (hh:mm:ss)	Concentrations (ppm / %)							
Run 1	Start	0930	Start Run 1	+ blowdown/over	0943-0959		overrange - recal, resume.			
			System Temperatures (°F)		Probe	Hot Box 250	HSL 1 250	HSL 2 250	HSL 3 250	HSL 4
	End	~~0945~~, 1046								
Run 2	Start	1107	2.67	1.0						
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run 3	Start	~~1223~~ ~~1230~~	2.22	1.3						
		1230	System Temperatures (°F)		Probe	Hot Box 250	HSL 1 250	HSL 2 250	HSL 3 250	HSL 4
	End	1330								
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									
Run	Start									
			System Temperatures (°F)		Probe	Hot Box	HSL 1	HSL 2	HSL 3	HSL 4
	End									

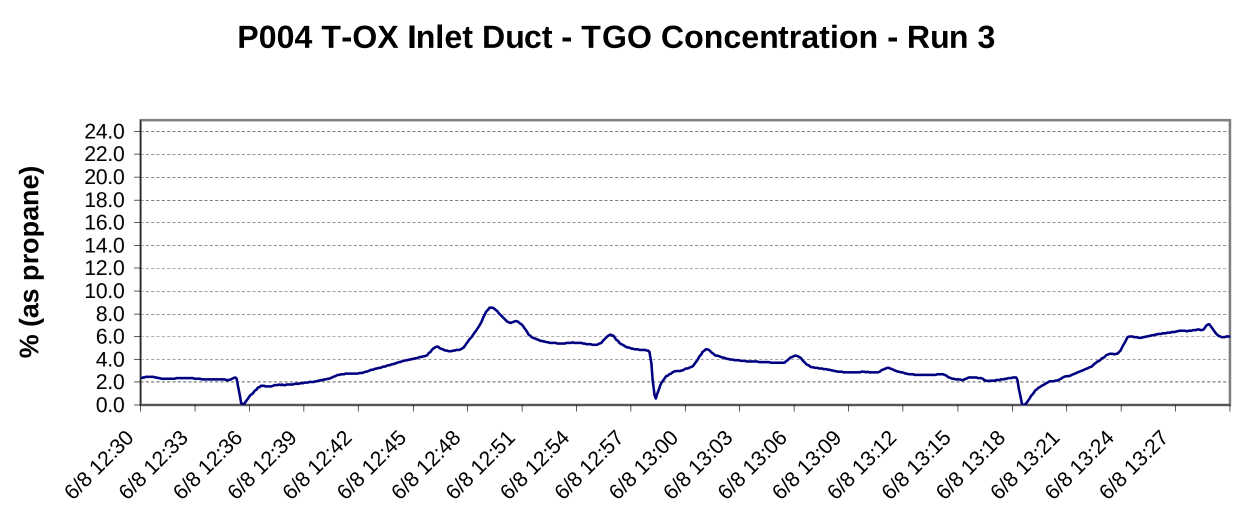
DAQ Time (hh:mm:ss)	Special Event Notes
	-Used Dilution Probe. T-DIL-005 @ ~30:1
	-Out-of-stack heated filters

MAQS
D:\Testing\Project Management\RS Methods for Printing\Project Management Binder.xls
(Project Management Binder.xls-CEMS RATA Field Data) 6/7/2021
1 of 1

Job Number: APOT-008887
Done By / Date: RC / 6-8-21
Final Check By / Date: RS / 6-8-21


P004 T-OX Inlet Duct - TGO Concentration - Run 1
% (as propane)
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6/8 9:30
6/8 9:31
6/8 9:34
6/8 9:37
6/8 9:40
6/8 9:59
6/8 10:02
6/8 10:05
6/8 10:08
6/8 10:11
6/8 10:15
6/8 10:18
6/8 10:21
6/8 10:24
6/8 10:27
6/8 10:30
6/8 10:33
6/8 10:36
6/8 10:39
6/8 10:42
6/8 10:45


P004 T-OX Inlet Duct - TGO Concentration - Run 2
% (as propane)
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6/8 11:07
6/8 11:10
6/8 11:13
6/8 11:16
6/8 11:19
6/8 11:22
6/8 11:25
6/8 11:28
6/8 11:31
6/8 11:34
6/8 11:37
6/8 11:40
6/8 11:43
6/8 11:46
6/8 11:49
6/8 11:52
6/8 11:55
6/8 11:58
6/8 12:01
6/8 12:04


P004 T-OX Inlet Duct - TGO Concentration - Run 3
% (as propane)
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6/8 12:30
6/8 12:33
6/8 12:36
6/8 12:39
6/8 12:42
6/8 12:45
6/8 12:48
6/8 12:51
6/8 12:54
6/8 12:57
6/8 13:00
6/8 13:03
6/8 13:06
6/8 13:09
6/8 13:12
6/8 13:15
6/8 13:18
6/8 13:21
6/8 13:24
6/8 13:27

Appendix A.3
P004 T-OX Exhaust Field Data

TEST DATA

Number of Test Runs	3			
Traverse Points	32			
	Run 1	**Run 2**	**Run 3**	**Average**
Stack Cross-Sectional Diameter 1 (**circular**) (in)	44.1	44.1	44.1	44.1
Stack Cross-Sectional Diameter 2 (**circular**) (in)	44.4	44.4	44.4	44.4
Pitot Tube Coefficient (Cp)	0.84	0.84	0.84	0.84
Barometric Pressure at Ground Level (Pbar) (mmHg)	733	733	733	733
Barometric Pressure at Ground Level (Pbar) (in Hg)	28.86	28.86	28.86	28.86
Elevation Difference Between Ground Level and Meter Box Locations (ft)	3.50	3.50	3.50	3.50
Elevation Difference Between Ground Level and Sampling Locations (ft)	45.00	45.00	45.00	45.00
Initial Dry Gas Meter Reading (ft3)	828.001	862.114	896.438	
Final Dry Gas Meter Reading (ft3)	861.968	896.297	930.752	
Dry Gas Meter Calibration Factor (Gamma)	1.0054	1.0054	1.0054	1.0054
Dry Gas Meter Calibration Coefficient (Delta H@)	1.82	1.82	1.82	1.82
Total Sampling Run Time (Theta) (min)	60	60	60	60
Volume of Water Vapor Condensed in the Impingers (g)	154.3	150.4	163.9	156.2
Weight of Water Vapor Collected in Silica Gel (g)	8.2	10.3	7.0	8.5
Air Percent by Volume Oxygen in Stack Gas (%-dry)	12.33	12.83	12.33	12.50
Air Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	5.00	4.92	4.67	4.86
Air Percent by Volume Nitrogen in Stack Gas (%-dry)	**82.67**	**82.25**	**83.00**	82.64
Average Pitot Rotation Angle	15.3			
Test Run Start Time (hrmin)	6/8/2021 9:30	6/8/2021 11:07	6/8/2021 12:30	
Test Run Stop Time (hrmin)	6/8/2021 10:46	6/8/2021 12:07	6/8/2021 13:30	

DETAILED RESULTS

Stack Gas Conditions	**Run 1**	**Run 2**	**Run 3**	**Average**
Stack Cross-Sectional Area (A) (ft2)	10.68	10.68	10.68	10.68
Barometric Pressure at Sampling Location (in Hg)	28.81	28.81	28.81	28.81
Dry Molecular Weight of Stack Gas (Md) (lb/lb-mole)	29.29	29.30	29.24	29.28
Wet Molecular Weight of Stack Gas (Ms) (lb/lb-mole)	27.14	27.16	27.01	27.10
Average Absolute Stack Gas Pressure (Ps) (in Hg)	28.79	28.79	28.80	28.79
Average Stack Gas Static Pressure (ps) (in H2O)	-0.27	-0.24	-0.23	-0.25
Average Stack Gas Temperature (ts) (°F)	1,477.3	1,454.2	1,426.2	1,452.5
Average Stack Gas Temperature (Ts) (°R)	1,937.3	1,914.2	1,886.2	1,912.5
Average Stack Gas Velocity (Vs) (ft/sec)	12.98	10.72	9.14	10.95
Average Stack Gas Velocity (Vs) (ft/min)	779	643	548	657
Wet Volumetric Stack Gas Flow at Actual Conditions (Qaw) (acfm)	8,315	6,869	5,857	7,014
Wet Volumetric Stack Gas Flow at Standard Conditions (scfm)	2,180	1,822	1,577	1,860
Dry Volumetric Stack Gas Flow at Standard Conditions (Qstd) (dscfm)	1,763	1,477	1,264	1,501
Percent by Volume Moisture as measured in Stack Gas (%H2O)	19.12	18.96	19.85	19.31

Test Results	**Run 1**	**Run 2**	**Run 3**	**Average**
Volume of Dry Gas Sampled at Standard Conditions (Vmstd) (dscf)	32.423	32.398	32.553	32.458
Rate of Dry Gas Sampled at Standard Conditions (dscfm)	0.540	0.540	0.543	0.541
Dry Mole Fraction of Flue Gas (Mfd)	0.809	0.810	0.802	0.807
Average Velocity Pressure (Delta P) (in H2O)	0.016	0.010	0.007	0.011
Average Square Root of Delta P	0.11	0.10	0.08	0.10
Average Pressure Differential of Orifice Meter (Delta H) (in H2O)	1.00	1.00	1.00	1.00
Average DGM Temperature (tm) (°F)	77.3	81.2	80.7	79.7
Average Dry Gas Meter Temperature (Tm) (°R)	537.3	541.2	540.7	539.7
Volume of Metered Gas Sample (Vm) (dry) (acf)	33.967	34.183	34.314	34.155

SAMPLING QA

	Run 1	**Run 2**	**Run 3**	**Average**
Post-Test Meter Calibration Check Value (Yqa)	1.003	1.000	0.997	1.000
Post-Test/Pre-Test Calibration Factor Difference (%)	0.26	0.55	0.87	0.56
Allowable Post-Test Leak Rate (dscfm)	0.020	0.020	0.020	0.020
Current Sampling Rate Status	**OK**	**OK**	**OK**	
1-Hour Sample Volume Based on Current Sampling Rate (dscf)	32.423	32.398	32.553	32.458
Count of Velocity Pressure Readings Below 0.05 in H2O	30	32	32	31
Sensitivity Factor for Differential Pressure Gauge (T)	1.20	1.26	1.33	1.262
Is Meter Box Manometer Adequate (Yes / No) ?	NO	NO	NO	

MEASURED DATA FROM TEST RUNS

Point Count	Run #	Run Time (min)	Pitot Delta P (in H2O)	Square Root of Delta P	Orifice Delta H (in H2O)	DGM Temp OUT (°F)	Average DGM Temp (°F)	Stack Pressure (in H2O)	Stack Temp (°F)
1	1	0	0.0020	0.045	1.00	74	74.00	-0.280	1427
2	1	10	0.0065	0.081	1.00	75	75.00		1429
3	1	20	0.0065	0.081	1.00	75	75.00		1436
4	1	30	0.0065	0.081	1.00	79	79.00		1439
5	1	40	0.0040	0.063	1.00	80	80.00		1431
6	1	50	0.0045	0.067	1.00	81	81.00		1425
7	1		0.0050	0.071					1415
8	1		0.0065	0.081					1409
9	1		0.0135	0.116					1494
10	1		0.0195	0.140					1506
11	1		0.0525	0.229					1597
12	1		0.0805	0.284					1620
13	1		0.0370	0.192					1627
14	1		0.0175	0.132					1423
15	1		0.0105	0.102					1407
16	1		0.0050	0.071					1388
17	1		0.0050	0.071				-0.257	1412
18	1		0.0075	0.087					1418
19	1		0.0075	0.087					1424
20	1		0.0070	0.084					1430
21	1		0.0040	0.063					1427
22	1		0.0050	0.071					1425
23	1		0.0070	0.084					1421
24	1		0.0105	0.102					1410
25	1		0.0135	0.116					1546
26	1		0.0200	0.141					1561
27	1		0.0405	0.201					1568
28	1		0.0330	0.182					1571
29	1		0.0330	0.182					1574
30	1		0.0115	0.107					1557
31	1		0.0160	0.126					1544
32	1		0.0180	0.134					1512
33	2	0	0.0050	0.071	1.00	83	83.00	-0.257	1412
34	2	10	0.0075	0.087	1.00	81	81.00		1418
35	2	20	0.0075	0.087	1.00	81	81.00		1424
36	2	30	0.0070	0.084	1.00	81	81.00		1430
37	2	40	0.0040	0.063	1.00	81	81.00		1427
38	2	50	0.0050	0.071	1.00	80	80.00		1425
39	2		0.0070	0.084					1421
40	2		0.0105	0.102					1410
41	2		0.0135	0.116					1546
42	2		0.0200	0.141					1561
43	2		0.0405	0.201					1568
44	2		0.0330	0.182					1571
45	2		0.0330	0.182					1574
46	2		0.0115	0.107					1557
47	2		0.0160	0.126					1544
48	2		0.0180	0.134					1512

MEASURED DATA FROM TEST RUNS

Point Count	Run #	Run Time (min)	Pitot Delta P (in H2O)	Square Root of Delta P	Orifice Delta H (in H2O)	DGM Temp OUT (°F)	Average DGM Temp (°F)	Stack Pressure (in H2O)	Stack Temp (°F)
49	2		0.0045	0.067				-0.232	1430
50	2		0.0060	0.077					1435
51	2		0.0080	0.089					1435
52	2		0.0070	0.084					1434
53	2		0.0045	0.067					1427
54	2		0.0025	0.050					1419
55	2		0.0040	0.063					1403
56	2		0.0105	0.102					1390
57	2		0.0070	0.084					1422
58	2		0.0075	0.087					1424
59	2		0.0065	0.081					1427
60	2		0.0065	0.081					1435
61	2		0.0045	0.067					1436
62	2		0.0035	0.059					1433
63	2		0.0075	0.087					1401
64	2		0.0050	0.071					1383
65	3	0	0.0045	0.067	1.00	80	80.00	-0.232	1430
66	3	10	0.0060	0.077	1.00	80	80.00		1435
67	3	20	0.0080	0.089	1.00	81	81.00		1435
68	3	30	0.0070	0.084	1.00	81	81.00		1434
69	3	40	0.0045	0.067	1.00	80	80.00		1427
70	3	50	0.0025	0.050	1.00	82	82.00		1419
71	3		0.0040	0.063					1403
72	3		0.0105	0.102					1390
73	3		0.0070	0.084					1422
74	3		0.0075	0.087					1424
75	3		0.0065	0.081					1427
76	3		0.0065	0.081					1435
77	3		0.0045	0.067					1436
78	3		0.0035	0.059					1433
79	3		0.0075	0.087					1401
80	3		0.0050	0.071					1383
81	3		0.0055	0.074				-0.234	1412
82	3		0.0080	0.089					1416
83	3		0.0100	0.100					1416
84	3		0.0120	0.110					1416
85	3		0.0030	0.055					1410
86	3		0.0045	0.067					1402
87	3		0.0090	0.095					1397
88	3		0.0065	0.081					1379
89	3		0.0075	0.087					1435
90	3		0.0070	0.084					1435
91	3		0.0105	0.102					1436
92	3		0.0060	0.077					1444
93	3		0.0075	0.087					1473
94	3		0.0110	0.105					1498
95	3		0.0065	0.081					1489
96	3		0.0115	0.107					1445

TEST DATA - EPA Method 25A

Number of Concentration Runs	3

Analyzer Calibration

	Run 1	Run 2	Run 3	Average
Actual Concentration of the Low-Level Calibration Gas (ppmv)	27.00	27.00	27.00	27.00
Actual Concentration of the Mid-Level Calibration Gas (ppmv)	44.93	44.93	44.93	44.93
Actual Concentration of the High-Level Calibration Gas (ppmv)	75.00	75.00	75.00	75.00
Analyzer Span During Test Run (ppmv)	90.00	90.00	90.00	90.00
Calibration Gas QA	GOOD	GOOD	GOOD	
Initial Analyzer Calibration Response for Zero Gas (ppmv)	0.00	0.00	0.00	0.00
Initial Analyzer Calibration Response for Low-Level Gas (ppmv)	26.70	26.70	26.70	26.70
Initial Analyzer Calibration Response for Mid-Level Gas (ppmv)	45.00	45.00	45.00	45.00
Initial Analyzer Calibration Response for High Level Gas (ppmv)	75.00	75.00	75.00	75.00
Final Analyzer Calibration Response for Zero Gas (ppm)	0.60	0.30	0.10	0.33
Final Analyzer Calibration Response for Mid-Level Gas (ppm)	45.00	43.80	44.30	44.37

Analyzer Calibration QA

	Run 1	Run 2	Run 3	Average
Analyzer Span During Test Run (ppmv as Carbon)	270	270	270	270
Zero Drift (% of Span)	0.67	0.33	0.11	0.37
Calibration Drift for Mid-Level Cal. Gas (% of Span)	0.00	-1.33	-0.78	-0.70
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	1.11	1.11	1.11	1.11
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-0.16	-0.16	-0.16	-0.16

DETAILED RESULTS

Emission Results

	Run 1	Run 2	Run 3	Average
Average TGO (VOC) Mass Emission Rate as Methane, (lb/hr)	0.0309	0.0157	0.0098	0.0188

CONCENTRATION CALCULATIONS

Average Effluent Total Gaseous Organic (TGO) Concentration

	Run 1	Run 2	Run 3	Average
Cmeas = Average Organic Concentration as Measured by Gas Analyzer as Propane (ppmvw)	1.89	1.15	0.83	1.29
K= Methane Equivalent Correction Factor for Propane	3	3	3	3
Cc= Average Total Gaseous Organic Concentration Measured as Methane (ppmvw)	5.67	3.45	2.49	3.87

Effective Date: 11/13/2017
Rev No. 8
Issued by: District Manager

Method 1.xls
Preliminary Field Data-Round

Plant: OMNOVA
City, State: Mogadore, OH
Location: T-OX ~~Inlet~~ Exhaust
RF 6-7-21

Measuring Tape ID: C-

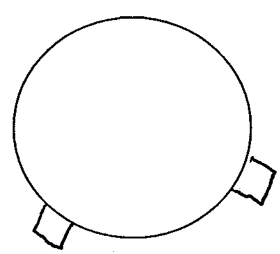
	Port 1	Port 2	Port 3	Port 4
Relative Location	Left	Right		
From Far Inside Wall to Outside of Port (in.)	54.1	54.4		
Nipple Length and/or Wall Thickness (in.)	10.0	10.0		
Nipple Protrusion (in.)	—	—		
Stack or Duct Depth (Inner Diameter) (in.)				
Port Hole Inner Diameter (in.)	3.0	3.0		
Measured Particulate Build-up (in.)	—	—		
Number of Ports (90° apart from each other)	2			
Direction of Flow and Stack Orientation:	Vertical ↑			
Sample Port Access	Platform			
Elevation of Meter Box from Ground Level (ft)	6			
Elevation of Ports from Ground Level (ft)	45			
Isokinetic Sample (Yes / No)	No			
Elevation of Barometer from Ground Level (ft)	6			
Stack Outer Circumference (in.)	—			

1) EPA Method 1 Section 11.3.1 -" ... for stacks having diameters greater than 24 in., no traverse points shall be within 1.00 in. of the stack walls; and for stack diameters equal to or less than 24 in., no traverse points shall be located within 0.50 in

Distance Upstream from Flow Disturbance (in.): 281.0
Disturbance Type: Egress

Distance Downstream from Flow Disturbance (in.): 108.0
Disturbance Type: Expansion

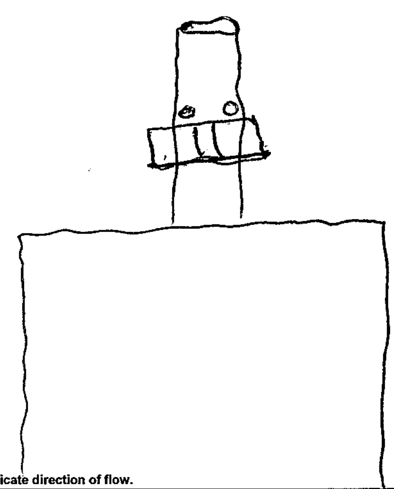
Plan view



Vertical stacks indicate - N, S, E, W ports.

Horizontal indicate top, side, bottom.

Elevation View



Horizontal indicate direction of flow.

Schematic to Indicate Port Orientation

Job Number: PROJ-008887
Done By / Date: RF / 6-7-21
Checked By / Date: JH / 6-7-21 MM / 6-7-21
Final Check By / Date: JH / 6-7-21

MAQS
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(Method 1.xls-Preliminary Field Data-Round) 6/7/2021
1 of 1

Cyclonic Flow Determination

Plant Name OMNOVA		Barometer ID- C-BAR-002
City, State Mogadore, OH		Digital Protractor ID- C-DPR 2-002
Test Location T-OX Exhaust		Steel Protractor ID- —
Pitot I.D. - T- PRB-163	Manometer I.D. - T- MIC-003	Umbilical I.D. T- UMC-103
		Umbilical I.D. T- M2U-201

Run Number - 1	Run Number -	Run Number -
Date - 6.8.21	Date -	Date -
Barometric Pressure (mmHg) : 732	Barometric Pressure (mmHg) :	Barometric Pressure (mmHg) :
Ambient Temperature (°F): 75	Ambient Temperature (°F):	Ambient Temperature (°F):
Start Time - 7:26	Start Time -	Start Time -
Finish Time - 7:46	Finish Time -	Finish Time -
Manometer Zero and Level - Yes ☑	Manometer Zero and Level - Yes ☐	Manometer Zero and Level - Yes ☐
Apparatus Leak Check - Done By: JG	Apparatus Leak Check - Done By:	Apparatus Leak Check - Done By:
Pre Impact Side - Pass ☑	Pre Impact Side - Pass ☐	Pre Impact Side - Pass ☐
Pre Static Side - Pass ☑	Pre Static Side - Pass ☐	Pre Static Side - Pass ☐

Test Point	Notes	Yaw Angle (°)	Test Point	Notes	Yaw Angle (°)	Test Point	Notes	Yaw Angle (°)
1		-30	1			1		
2		-40	2			2		
3		-40	3			3		
4		-5	4			4		
5		10	5			5		
6		10	6			6		
7		50	7			7		
8		0	8			8		
9		-20	9			9		
10		-20	10			10		
11		0	11			11		
12		0	12			12		
13		15	13			13		
14		0	14			14		
15		2	15			15		
16		-2	16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
	Avg.	15.25		Avg.			Avg.	

Apparatus Leak Check - Done By: JG	Apparatus Leak Check - Done By:	Apparatus Leak Check - Done By:
Post Impact Side - Pass ☑	Post Impact Side - Pass ☐	Post Impact Side - Pass ☐
Post Static Side - Pass ☑	Post Static Side - Pass ☐	Post Static Side - Pass ☐

Note: Yaw angle average is the sum of the absolute values divided by the number of measurements, and must be ≤ 20°.
Yaw angle is the angle measured from the point where zero ΔP should be obtained to the point where zero ΔP is actually obtained

Job Number: PROJ-008887
Done By / Date: JG / 6.8.21
Checked By / Date: — / — : — / —
Final Check By / Date: RS / 6-8-21

MAQS
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(Method 2.xls-Cyclonic Flow Determination) 6/7/2021
1 of 1

Flow Determination

Plant Name: OMNOVA — Test Location T-OX Exhaust
City, State: Mogadore, OH — Pitot I.D. - T-PRB-163 — Pitot Coefficient - 0.84
Thermocouple I.D. - T-PRB-163 — Barometer I.D. - C- BAR-002
Manometer I.D. - T-MIC-003 — Umbilical I.D. - T- UMC-103
Date: 6.8.21 — Temp Display I.D. - T-MTB-004 — Umbilical I.D. - T- M2U-201

Pre - Apparatus Leak Check - Done By: JG
Manometer Zero and Level - Yes ☑ — Post - Apparatus Leak Check - Done By: JG

Pre Impact Side - Pass ☑	Pre Impact Side - Pass ☑	Pre Impact Side - Pass ☑	Pre Impact Side - Pass ☑	Pre Impact Side - Pass ☐
Pre Static Side - Pass ☑	Pre Static Side - Pass ☑	Pre Static Side - Pass ☑	Pre Static Side - Pass ☑	Pre Static Side - Pass ☐

	Run No: 1		Run No: 2		Run No: 3		Run No: 4		Run No:	
	Start Time: 9:37		Start Time: 11:15		Start Time: 12:40		Start Time: 13:29		Start Time:	
	Stop Time: 9:50		Stop Time: 11:23		Stop Time: 12:49		Stop Time: 13:37		Stop Time:	
	Pbar (mmHg): 733		Pbar (mmHg): 733		Pbar (mmHg): 733		Pbar (mmHg): 733		Pbar (mmHg):	
	Pstatic: -0.2800		Pstatic: -0.2570		Pstatic: -0.2320		Pstatic: -0.2335		Pstatic:	
Test Point	ΔP ($in.H_2O$)	Temp (°F)	ΔP ($in.H_2O$)	Temp (°F)	ΔP ($in.H_2O$)	Temp (°F)	ΔP ($in.H_2O$)	Temp (°F)	ΔP ($in.H_2O$)	Temp (°F)
1	0.0020	1427	0.0050	1412	0.0045	1430	0.0055	1412		
2	0.0065	1429	0.0075	1418	0.0060	1435	0.0080	1416		
3	0.0065	1436	0.0075	1424	0.0080	1435	0.0100	1416		
4	0.0065	1439	0.0070	1430	0.0070	1434	0.0120	1416		
5	0.0040	1431	0.0040	1427	0.0045	1427	0.0030	1410		
6	0.0045	1425	0.0050	1425	0.0025	1419	0.0045	1402		
7	0.0050	1415	0.0070	1421	0.0040	1403	0.0090	1397		
8	0.0065	1409	0.0105	1410	0.0105	1390	0.0065	1379		
9	0.0135	1494	0.0135	1546	0.0070	1422	0.0075	1435		
10	0.0195	1506	0.0200	1561	0.0075	1424	0.0070	1435		
11	0.0525	1597	0.0405	1568	0.0065	1427	0.0105	1436		
12	0.0805	1620	0.0330	1571	0.0065	1435	0.0060	1444		
13	0.0370	1627	0.0330	1574	0.0045	1436	0.0075	1473		
14	0.0175	1423	0.0115	1557	0.0035	1433	0.0110	1498		
15	0.0105	1407	0.0160	1544	0.0075	1401	0.0065	1489		
16	0.0050	1388	0.0180	1512	0.0050	1383	0.0115	1445		
17										
18										
19										
20										
21										
22										
23										
24										
25										

Post Leak Checks

Post Impact Side - Pass ☑	Post Impact Side - Pass ☑	Post Impact Side - Pass ☑	Post Impact Side - Pass ☑	Post Impact Side - Pass ☐
Post Static Side - Pass ☑	Post Static Side - Pass ☑	Post Static Side - Pass ☑	Post Static Side - Pass ☑	Post Static Side - Pass ☐

Job Number: PROJ-008887
Done By / Date: JG / 6.8.21
Checked By / Date: — / — : — / —
Final Check By / Date: [illegible] / 6-9-21

MAQS
D:\Testing\Project Management\RS Methods for Printing\Method 2.xls
(Method 2.xls-RATA-Flow Determination) 6/7/2021
1 of 1

US EPA Method 1 Traverse Point Determination

Relative Port Location	Left	Right
From Far Wall to Outside of Port (in.)	54.1	54.4
Nipple Length or Wall Thickness (in.)	10.0	10.0
Port Protrusion Length (opt) (in.)	0.0	0.0
Depth of Stack or Duct (in.)	44.1	44.4
Stack or Duct Type	Elliptical	
Port Hole Inner Diameter (in.)	3.0	
Stack or Duct Width (If Rectangular) (in.)		
Stack Outer Circumference (in.)		
Number of Ports Traversed	2	
Elevation of Meter Box from Ground Level (ft)	3	
Elevation of Ports from Ground Level (ft)	45	
Stack Build-up (in.)	0.0	
Stack Cross-Sectional Diameter 1 (in)	44.1	
Stack Cross-Sectional Diameter 2 (in)	44.4	

Note:
Add nipple protrusion length to Point 1 only.
Actual nipple length = (length - protrusion)

Relocate to a distance equal to the inside diameter of the nozzle being used or to the above minimum distances, whichever is larger.

This Stack having a diameter greater than 24-inches, shall have no traverse points located within 1.0-inch of the stack wall.

"Vertical" or "Horizontal" Flow	Vertical
Direction of Flow	Up
"Velocity" or "Isokinetic" Traverse	Velocity

New Method 1 verified on06/07/2021 by: JH/MM

Port Distance Upstream from Flow Disturbance (in.)	281.0
Diameters Upstream from Flow Disturbance (³ 0.5 De)	6.3
Minimum Traverse Points Needed for a Velocity Traverse *	12
Minimum Traverse Points Needed for a Isokinetic Traverse *	12

Port Distance Downstream from Flow Disturbance (in.)	108.0
Diameters Downstream from Flow Disturbance (³ 2.0 De)	2.4
Minimum Traverse Points Needed for a Velocity Traverse *	16
Minimum Traverse Points Needed for a Isokinetic Traverse *	24

Minimum Traverse Points per Method 1	16
Number of Traverse Points for this Elliptical Stack or Duct	16
Point Overide	
Duct Area - in^2	1537.84
Duct Area - ft^2	10.6795

Port	Point	% of Duct Depth	Dist. From Inside Wall (Decimal)	Dist. From Outside Wall (Decimal)
1	1	3.2	1.4	11.4
1	2	10.5	4.6	14.6
1	3	19.4	8.6	18.6
1	4	32.3	14.2	24.2
1	5	67.7	29.9	39.9
1	6	80.6	35.5	45.5
1	7	89.5	39.5	49.5
1	8	96.8	42.7	52.7
2	1	3.2	1.4	11.4
2	2	10.5	4.7	14.7
2	3	19.4	8.6	18.6
2	4	32.3	14.3	24.3
2	5	67.7	30.1	40.1
2	6	80.6	35.8	45.8
2	7	89.5	39.7	49.7
2	8	96.8	43.0	53.0

Method 3 Fyrite Field Data

Plant Name: OMNOVA
Test Location: T-OX Exhaust

CO_2 Zero: Y N O_2 Zero: Y / N

15 pumps to purge
18 pumps to sample

EPA Method 3 Fyrite Analysis Audit		Analyzed by:: JG
Time of Analysis	%CO_2 Audit Gas Conc (%) 6.1	%O_2 Audit Gas Conc (%) 6.0
10:10	6.25	6.5
↓	6.25	6.5
10:25	6.25	6.5
Analyzer I.D. - A - FYR - 007	Audit Gas Cylinder I.D.:	ALM-017673

*NOTE: The average of the three passes of %CO_2 and %O_2 must agree within ± 0.5% of the audit gas concentration value.

Run Number: 1   **Analyzed by::** JG

Time of Sample Collection	Time of Analysis	%CO_2 (A)	%O_2 (B)	%N_2 (100 - (A + B))
9:30	10:41	5.0	12.5	82.5
↓	↓	5.0	12.25	82.75
10:30	10:54	5.0	12.0	83.0

Analyzer I.D. - A - FYR - 007   Tedlar Bag I.D.: PROJ-008887 - 1 - M3/TB

Run Number: 2   **Analyzed by::** JG

Time of Sample Collection	Time of Analysis	%CO_2 (A)	%O_2 (B)	%N_2 (100 - (A + B))
11:07	13:00	5.0	13.0	82.0
↓	↓	5.0	12.75	82.25
12:07	13:13	4.75	12.75	82.5

Analyzer I.D. - A - FYR - 007   Tedlar Bag I.D.: PROJ-008887 - 2 - M3/TB

Run Number: 3   **Analyzed by::** JG

Time of Sample Collection	Time of Analysis	%CO_2 (A)	%O_2 (B)	%N_2 (100 - (A + B))
12:23	13:41	4.5	12.5	83.0
↓	↓	4.75	12.25	83.0
13:23	13:55	4.75	12.25	83.0

Analyzer I.D. - A - FYR - 007   Tedlar Bag I.D.: PROJ-008887 - 3 - M3/TB

Job Number: 008887
Done By / Date: JG / 6.8.21
Final Check By / Date: JH / 6-9-21

US EPA Method 3 Dry Molecular Weight Calculation

Run 1

	%CO2	%O2	%N2	Molecular Weight	Mean Difference
	5.00	12.50	82.5	29.30	0.007
	5.00	12.50	82.5	29.30	0.007
	5.00	12.00	83.0	29.28	-0.013
Average	5.00	12.33	82.67	29.29	

Run 2

	%CO2	%O2	%N2	Molecular Weight	Mean Difference
	5.00	13.00	82.0	29.32	0.020
	5.00	12.75	82.3	29.31	0.010
	4.75	12.75	82.5	29.27	-0.030
Average	4.92	12.83	82.25	29.30	

Run 3

	%CO2	%O2	%N2	Molecular Weight	Mean Difference
	4.50	12.50	83.0	29.22	-0.020
	4.75	12.25	83.0	29.25	0.010
	4.75	12.25	83.0	29.25	0.010
Average	4.67	12.33	83.00	29.24	

MONTROSE AIR QUALITY SERVICES

Sample Recovery & Calibration Check Datasheet

Project Information

Date 6-8-21 Project # 008887

Customer / Facility Synthomer

Unit ID / Sample Location T-OX Exhaust Stack

Run # 1-3 Operator

Equipment Identification

Ref. Thermometer —

Hygrometer —

Field Balance 019

Check Weights W500-002

Calipers —

Balance Audit (Field balance must be within 0.5g of check weight mass)

Date	6-7-21	6-8-21	
Standard mass, g	500.0	500.0	
Field balance mass, g	500.1	500.0	

Ambient Conditions (Mobile Lab)

Relative humidity, % —

Temperature, °F 65

Mobile lab # Box 5

Moisture Determination

	Contents	Run1 Initial	Run1 Final	Run1 Net	Run 2 Initial	Run 2 Final	Run 2 Net	Run 3 Initial	Run 3 Final	Run 3 Net
Knockout										
Impinger 1	H_2O	660.8	794.7	133.9	708.0	819.1	111.1	703.8	837.6	133.8
Impinger 2	H_2O	678.4	695.0	16.6	681.1	711.8	30.7	708.9	734.0	25.1
Impinger 3	empty	576.6	580.4	3.8	590.7	599.3	8.6	591.2	596.2	5.0
Impinger 4										
Impinger 5										
Impinger 6										
Impinger 7										
Impinger 8										
Silica Gel	←	947.7	955.9	8.2	931.6	941.9	10.3	934.4	941.4	7.0
Line Rinse										
Train Net Gain (Vlc)				162.5			160.7			170.9

~~**Nozzle Measurements** (Difference between any two measurements must not be more than 0.004 in (0.1 mm))~~

~~Nozzle 1 diameters D1 D2 D3 Average~~

~~Nozzle 2 diameters D1 D2 D3 Average~~

~~Nozzle 3 diameters D1 D2 D3 Average~~

Nozzle Material ☐ quartz ☐ glass ☐ steel ☐ titanium ☒ inconel ☐ other

Probe Type ☐ heated ☒ unheated ☐ air-cooled ☐ water-cooled ☐ other

Probe Liner ☐ quartz ☐ glass ☐ steel ☒ Teflon ☐ other

~~**Filter Information**~~

~~Front Half: ☐ quartz fiber ☐ glass fiber ☐ Teflon ☐ Teflon/quartz ☐ other~~

~~Filter Number: Run 1: Run 2: Run 3: Run :~~

~~Back Half: ☐ quartz fiber ☐ glass fiber ☐ Teflon ☐ Teflon/quartz ☐ other~~

Reagent Information

Type	Lot Number

Sample Observations

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓

Checked by: SH Team Leader: RS

001AS-QMS-FM-226

US EPA Method 4 Gravimetric Determination for Moisture
US EPA Method 4 Sampling Train

RUN 1

	Initial Tare	Final Tare	Net Weights
Impinger No. 1	660.8	794.7	133.9
Impinger No. 2	678.4	695.0	16.6
Impinger No. 3	576.6	580.4	3.8
		Total Condensed:	**154.3**
Silica Gel	947.7	955.9	8.2
		Total Absorbed:	**8.2**
		Overall Total:	**162.5**

RUN 2

	Initial Tare	Final Tare	Net Weights
Impinger No. 1	708.0	819.1	111.1
Impinger No. 2	681.1	711.8	30.7
Impinger No. 3	590.7	599.3	8.6
		Total Condensed:	**150.4**
Silica Gel	931.6	941.9	10.3
		Total Absorbed:	**10.3**
		Overall Total:	**160.7**

RUN 3

	Initial Tare	Final Tare	Net Weights
Impinger No. 1	703.8	837.6	133.8
Impinger No. 2	708.9	734.0	25.1
Impinger No. 3	591.2	596.2	5.0
		Total Condensed:	**163.9**
Silica Gel	934.4	941.4	7.0
		Total Absorbed:	**7.0**
		Overall Total:	**170.9**

MONTROSE AIR QUALITY SERVICES

EPA Method 4 Field Datasheet (Isokinetic)

Project Information		Sampling Conditions		ALT 011	TC ID:	Ambient °F	Ref. °F
Date	6.8.21	Static Pressure, in. H_2O	–	Stack			
Project #	008887	Ambient Temp, °F	75	Probe			
Customer/Facility	OMNOVA	Barometric Pressure, in. Hg	733 mm	Filter Box			
Unit ID/Sample Location	T-OX Exhaust	Ref. Barometer ID	C-BAR-002	Filter Exit			
Run #	1	Wind Speed / Direction	–	Meter outlet			
Operator	JG	Precipitation, Y / N, type	–	Impinger Exit	T-UMA-062		
		Probe / Filter Temp Range, °F	–	Other			

Sampling Equipment IDs		Calibration	
Meterbox ID	T-MTB-004	Meterbox Y	1.0054
Umbilical ID	T-UMC-103	Meterbox ΔH@, in. H_2O	1.820
Nozzle ID	–	Nozzle diameter, Dn, in.	–
Pitot / Probe ID	T-PRB-163	Pitot coefficient, Cp	–
Manometer ID	–	Manometer zero and level	☑ yes
Sensitivity	–	K-Factor	–

Equipment Checks	Pre	Mid	Post
Pitot (+), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot (-), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot visual inspection	☐ pass	☐ pass	☐ pass
Nozzle visual inspection	☐ pass	☐ pass	☐ pass
Meter, cfm @ in. Hg	0.001 @ 15	– @ –	0.000 @ 4.0
Intermediate leak check volume, ft³	– /	– /	/

Ref. Thermometer ID

Continuity Check ☐ Continuity w/ Proper Polarity

Notes: T-PMP-008

Traverse Point #	Elapsed Time	Clock Time 24hr	DGM Reading, Vm, ft³	Velocity Head, ΔP in H_2O	Orifice Pressure Differential, ΔH Target	Orifice Pressure Differential, ΔH Actual	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F Box	Filter Temp, °F Exit	Impinger Exit Temp, °F	Dry Gas Meter Temperature, °F Inlet	Dry Gas Meter Temperature, °F Outlet		Pump Vacuum, in. Hg
–	0	9:30	828.001	–	1.0	1.00	–	–	–	–	57	–	74	–	2.5
–	10	–	* ~~830.0~~ 833.8	–	–	1.00	–	–	–	–	56	–	75	–	2.5
–	20	–	* ~~84400~~ 838.0	–	–	1.00	–	–	–	–	55	–	75	–	2.5
–	30	–	844.99	–	–	1.00	–	–	–	–	62	–	79	–	2.5
–	40	–	850.0	–	–	1.00	–	–	–	–	64	–	80	–	2.5
–	50	–	856.30	–	–	1.00	–	–	–	–	65	–	81	–	3.0
–	60	–	~~862~~ *	–	–	–	–	–	–	–	–	–	–	–	–
			861.968												
Averages															

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Checked By RS Team Leader RS

001AS-QMS-FM-225

 6.8.21

MONTROSE AIR QUALITY SERVICES

EPA Method 4 Field Datasheet (Isokinetic)

Page 1 of 1

Project Information

Date 6.8.21 Project # 008887

Customer/Facility OMNOVA

Unit ID/Sample Location T-OX Exhaust

Run # 2 Operator VG

Sampling Conditions

Static Pressure, in. H_2O — Ambient Temp, °F 80

Barometric Pressure, in. Hg 733 mm Ref. Barometer ID C-BAR-002

Wind Speed / Direction — Precipitation, Y / N, type —

Probe / Filter Temp Range, °F —

ALT 011	TC ID:	Ambient °F	Ref. °F
Stack			
Probe			
Filter Box			
Filter Exit			
Meter outlet			
Impinger Exit	T-UMA-062		
Other			

Ref. Thermometer ID

Continuity Check ☐ Continuity w/ Proper Polarity

Notes: T-PMP-008

Sampling Equipment IDs

Meterbox ID T-MTB-004

Umbilical ID T-UMC-103

Nozzle ID —

Pitot / Probe ID —

Manometer ID —

Sensitivity —

Calibration

Meterbox Y 1.0054

Meterbox ΔH@, in. H_2O 1.820

Nozzle diameter, Dn, in. —

Pitot coefficient, Cp —

Manometer zero and level ☑ yes

K-Factor —

Equipment Checks	Pre	Mid	Post
Pitot (+), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot (-), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot visual inspection	☐ pass	☐ pass	☐ pass
Nozzle visual inspection	☐ pass	☐ pass	☐ pass
Meter, cfm @ in. Hg	0.001 @ 15	— @ —	0.000 @ 4.0
Intermediate leak check volume, ft³		— / —	/

Traverse Point #	Elapsed Time	Clock Time 24hr	DGM Reading, Vm, ft³	Velocity Head, ΔP in H_2O	Orifice Pressure Differential, ΔH Target	Orifice Pressure Differential, ΔH Actual	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F Box	Filter Temp, °F Exit	Impinger Exit Temp, °F	Dry Gas Meter Temperature, °F Inlet	Dry Gas Meter Temperature, °F Outlet		Pump Vacuum, in. Hg
—	0	11:07	862.114	—	1.0	1.00	—	—	—	—	62	—	83	—	2.5
—	10	—	867.82	—	—	1.00	—	—	—	—	56	—	81	—	2.5
—	20	—	873.55	—	—	1.00	—	—	—	—	58	—	81	—	2.5
—	30	—	879.16	—	—	1.00	—	—	—	—	60	—	81	—	2.5
—	40	—	884.8	—	—	1.00	—	—	—	—	66	—	81	—	2.5
—	50	—	890.65	—	—	1.00	—	—	—	—	67	—	80	—	2.5
—	60	12:07	896.297	—	—	—	—	—	—	—	—	—	—	—	—
Averages															

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Checked By VG Team Leader RS

001AS-QMS-FM-225

MONTROSE AIR QUALITY SERVICES

EPA Method 4 Field Datasheet (Isokinetic)

Project Information		Sampling Conditions			
Date	6-8-21	Static Pressure, in. H_2O	–	Ambient Temp, °F	80
Project #	008887	Barometric Pressure, in. Hg	733 mm	Ref. Barometer ID	C-BAR-002
Customer/Facility	OMNOVA	Wind Speed / Direction	–	Precipitation, Y / N, type	–
Unit ID/Sample Location	T-OX Exhaust	Probe / Filter Temp Range, °F	–		
Run #	3				
Operator	JG				

ALT 011	TC ID:	Ambient °F	Ref. °F
Stack			
Probe			
Filter Box			
Filter Exit			
Meter outlet			
Impinger Exit	T-UMA-062		
Other			

Ref. Thermometer ID ___

Continuity Check ☐ Continuity w/ Proper Polarity

Notes: T-PMP-008

Sampling Equipment IDs	
Meterbox ID	T-MTB-004
Umbilical ID	T-UMC-103
Nozzle ID	–
Pitot / Probe ID	–
Manometer ID	–
Sensitivity	–

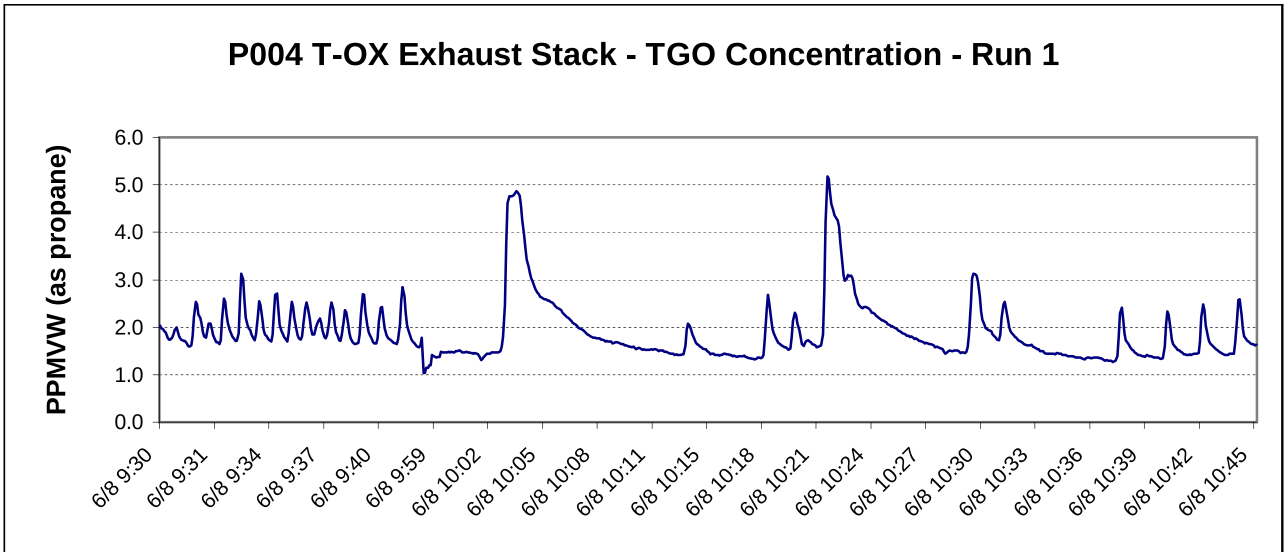
Calibration	
Meterbox Y	1.0054
Meterbox ΔH@, in. H_2O	1.820
Nozzle diameter, Dn, in.	–
Pitot coefficient, Cp	–
Manometer zero and level	☑ yes
K-Factor	–

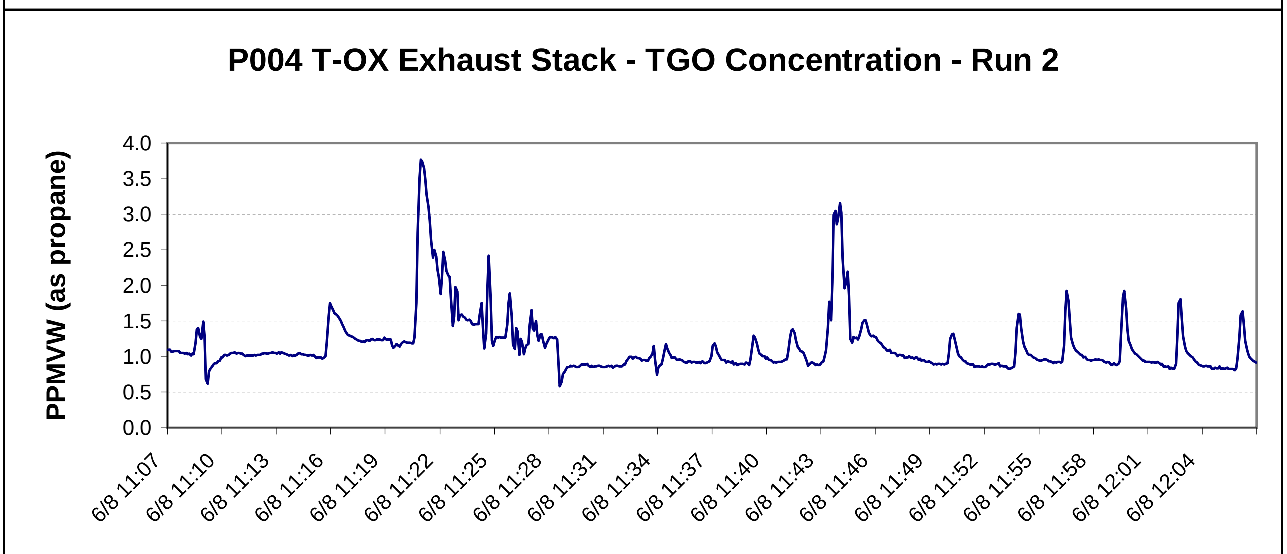
Equipment Checks	Pre	Mid	Post
Pitot (+), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot (-), pass @ in. H_2O	☐ @	☐ @	☐ @
Pitot visual inspection	☐ pass	☐ pass	☐ pass
Nozzle visual inspection	☐ pass	☐ pass	☐ pass
Meter, cfm @ in. Hg	0.001 @ 15	– @ –	0.000 @ 3.5
Intermediate leak check volume, ft^3	– /	– /	/

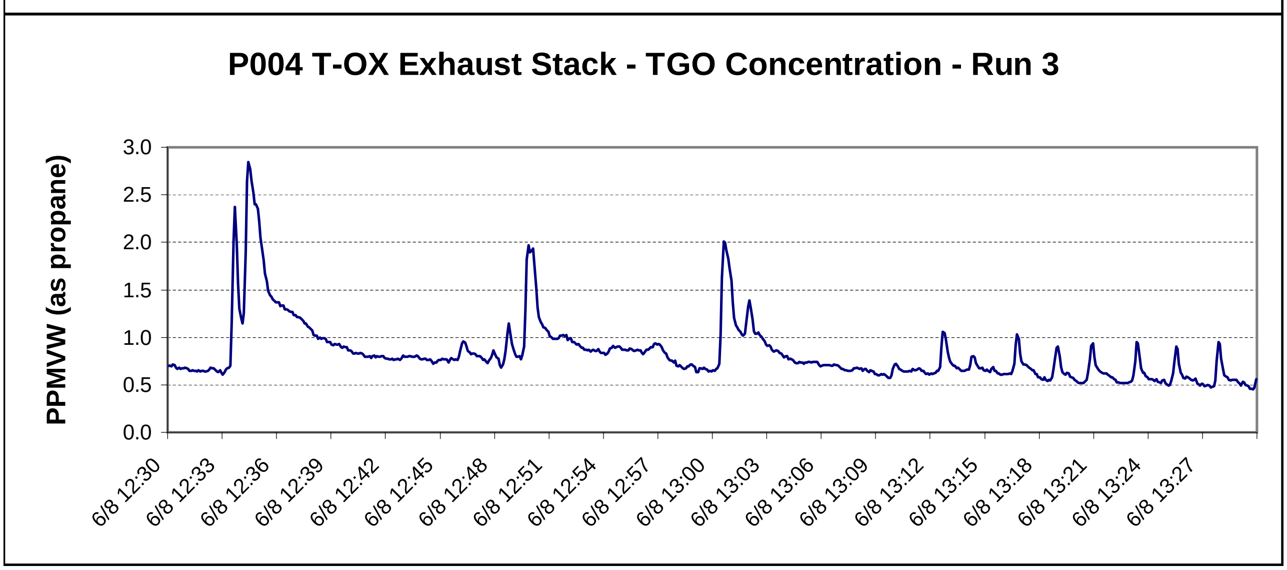
Traverse Point #	Elapsed Time	Clock Time 24hr	DGM Reading, Vm, ft^3	Velocity Head, ΔP in H_2O	Orifice Pressure Differential, ΔH Target	Orifice Pressure Differential, ΔH Actual	Stack Temp, °F	Probe Temp, °F	Filter Temp, °F Box	Filter Temp, °F Exit	Impinger Exit Temp, °F	Dry Gas Meter Temperature, °F Inlet	Dry Gas Meter Temperature, °F Outlet		Pump Vacuum, in. Hg
–	0	12:23	896.438	–	1.0	1.00	–	–	–	–	59	–	80	–	2.5
–	10	–	902.28	–	–	1.00	–	–	–	–	56	–	80	–	2.5
–	20	–	908.80	–	–	1.00	–	–	–	–	59	–	81	–	2.5
–	30	–	914.00	–	–	1.00	–	–	–	–	60	–	81	–	2.5
–	40	–	919.60	–	–	1.00	–	–	–	–	59	–	80	–	2.5
–	50	–	925.2	–	–	1.00	–	–	–	–	60	–	82	–	2.5
–	60	13:23	930.752	–	–	–	–	–	–	–	–	–	–	–	–
Averages															

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Checked By JG Team Leader KS

001AS-QMS-FM-225


P004 T-OX Exhaust Stack - TGO Concentration - Run 1
PPMVW (as propane)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
6/8 9:30
6/8 9:31
6/8 9:34
6/8 9:37
6/8 9:40
6/8 9:59
6/8 10:02
6/8 10:05
6/8 10:08
6/8 10:11
6/8 10:15
6/8 10:18
6/8 10:21
6/8 10:24
6/8 10:27
6/8 10:30
6/8 10:33
6/8 10:36
6/8 10:39
6/8 10:42
6/8 10:45


P004 T-OX Exhaust Stack - TGO Concentration - Run 2
PPMVW (as propane)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
6/8 11:07
6/8 11:10
6/8 11:13
6/8 11:16
6/8 11:19
6/8 11:22
6/8 11:25
6/8 11:28
6/8 11:31
6/8 11:34
6/8 11:37
6/8 11:40
6/8 11:43
6/8 11:46
6/8 11:49
6/8 11:52
6/8 11:55
6/8 11:58
6/8 12:01
6/8 12:04


P004 T-OX Exhaust Stack - TGO Concentration - Run 3
PPMVW (as propane)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
6/8 12:30
6/8 12:33
6/8 12:36
6/8 12:39
6/8 12:42
6/8 12:45
6/8 12:48
6/8 12:51
6/8 12:54
6/8 12:57
6/8 13:00
6/8 13:03
6/8 13:06
6/8 13:09
6/8 13:12
6/8 13:15
6/8 13:18
6/8 13:21
6/8 13:24
6/8 13:27

Appendix A.4
Example Calculations

EPA Methods 2D and 25A
Nomenclature and Sample Calculations

Run No. - 1

Constants

CO_2F_{wt}= 44.0	in wg= 0.073529	NO_2F_{wt}= 46.01	$HClF_{wt}$= 36.46
O_2F_{wt}= 32.0	gr= 0.000142857	COF_{wt}= 28.01	SO_2F_{wt}= 64.06
CON_2F_{wt}= 28.0	mmBtu= 1000000 Btu	$H_2SO_4F_{wt}$= 98.08	Cl_2F_{wt}= 70.91
H_2OF_{wt}= 18.015	CF_{wt}= 12.011	T_{std}= 527.67	P_{std}= 29.92
ArF_{wt}= 40.0	PF_{wt}= 44.0962	CH_{4fwt}= 16.0425	

Stack Variables

P_{bar} =	28.82	in. Hg	barometric pressure
E_{box} =	3	ft	elevation difference between ground level and meter box
E_{sam} =	3	ft	elevation difference between ground level and sampling ports
θ =	75.0	min	net run time (minutes)
P_g =	0.45	in. H_2O	flue gas static pressure
T_{savg} =	622.94	R	average absolute flue gas temperature (460R+tsavg °F)
$SQ\Delta P_{avg}$ =	0.72	in. wg	average square root ΔP
ΔP_{avg} =	0.54	in. wg	Facility installed Pressure Differential Orifice

Calculated Stack Variables

Barometric pressure at sampling location

NOTE: Barometric pressure recorded at ground level

$$P_{sam} = P_{bar} - [(E_{sam} / 100 \text{ ft}) * 0.1 \text{ in. Hg}]$$

$$P_{sam} = 28.82 - ((3.0 / 100) * 0.1)$$

$$P_{sam} = 28.81 \text{ in. Hg}$$

Absolute flue gas pressure

$$P_s = P_{sam} + (Pg / 13.6)$$

$$P_s = 28.81 + (0.45 / 13.6)$$

$$P_s = 28.85 \text{ in. Hg}$$

Dry molecular weight of flue gas (lb/lb-mole)

$$M_d = [(\%CO_2 / 100) * 44.0] + [(\%O_2 / 100) * 32.0] + [((100 - \%CO_2 - \%O_2) / 100) * 28.0]$$

$$M_d = ((0.00 / 100) * 44.0) + ((0.00 / 100) * 32.0) + (((100 - 0.00 - 0.00) / 100) * 28.0)$$

$$M_d = 28.00 \text{ lb/lb-mole}$$

$$M_d = 29.00$$

Wet volumetric flue gas flow rate at actual conditions (acfm)

$$Q_{aw} = 9803.6 * Dp_{avg} \wedge 0.5311 / 60$$

$$Q_{aw} = 118.20 \text{ ft}^3\text{/min}$$

Wet volumetric flue gas flow rate at standard conditions (scfm)

$$Q_{sdw} = Q_{sw} * (T_{std} / T_{savg}) * (P_s / P_{std})$$

$$Q_{sdw} = 118.2 * (527.7 / 622.938) * (28.85 / 29.92)$$

$$Q_{sdw} = 96.54$$

Method 25A Calculations

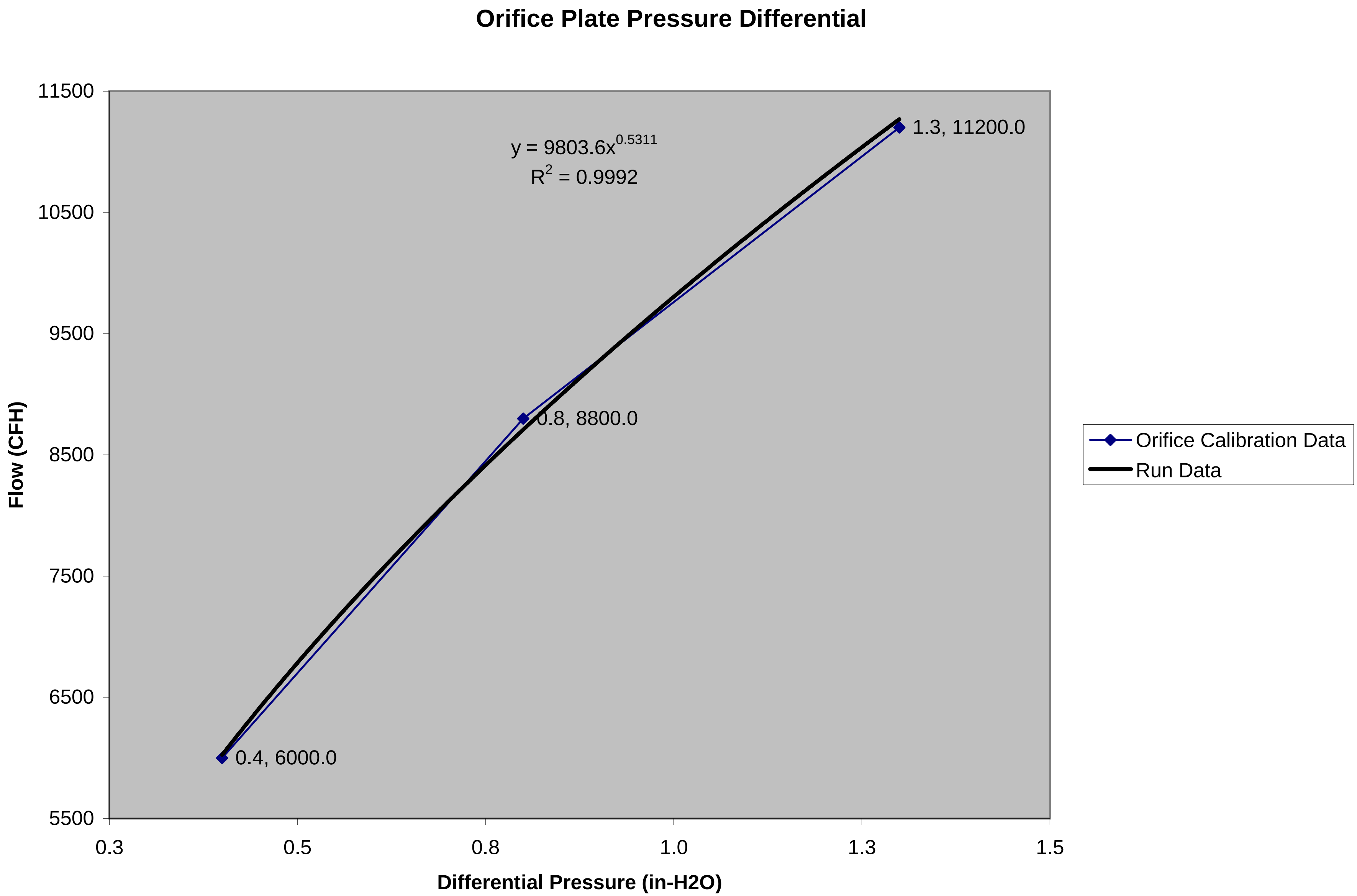
TGO concentration (ppmvw as methane)

TGOppmvw = 186751 ppmvw as methane

TGO mass emission rate (lb/hr as methane)

$$MERTGO = (60 \text{ min/hr} * TGO \text{ ppmvw} * CH_{4fwt} * Qsdw) / (385.3 \text{ ft}^3 * 10^6)$$

MERTGO = 45.04 lb/hr (as methane)



Orifice Plate Pressure Differential
y = 9803.6x^0.5311
R^2 = 0.9992
1.3, 11200.0
0.8, 8800.0
0.4, 6000.0
11500
10500
9500
8500
7500
6500
5500
0.3
0.5
0.8
1.0
1.3
1.5
Flow (CFH)
Differential Pressure (in-H2O)
Orifice Calibration Data
Run Data

EPA Methods 1, 2, 3, 4, and 25A
Nomenclature and Sample Calculations

Run No. - 1

Constants

CO_2F_{wt}= 44.0	in wg= 0.073529	NO_2F_{wt}= 46.01	$HClF_{wt}$= 36.46
O_2F_{wt}= 32.0	gr= 0.000142857	COF_{wt}= 28.01	SO_2F_{wt}= 64.06
CON_2F_{wt}= 28.0	mmBtu= 1000000 Btu	$H_2SO_4F_{wt}$= 98.08	Cl_2F_{wt}= 70.91
H_2OF_{wt}= 18.015	CF_{wt}= 12.011	T_{std}= 527.67	P_{std}= 29.92
ArF_{wt}= 40.0	PF_{wt}= 44.0962	CH_{4fwt}= 16.0425	

Stack Variables

Cp =	0.84		pitot tube coefficient (dimensionless)
P_{bar} =	29.13	in. Hg	barometric pressure
E_{box} =	4	ft	elevation difference between ground level and meter box
E_{sam} =	45	ft	elevation difference between ground level and sampling ports
γ =	1.0054		gamma, dry gas meter calibration factor (dimensionless)
θ =	60.0	min	net run time (minutes)
V_{lc} =	162.5	g	total mass of liquid collected in impingers (g)
$\%CO_2$ =	5.00	%	percent CO_2 by volume (dry basis) (dimensionless)
$\%O_2$ =	12.33	%	percent O_2 by volume (dry basis) (dimensionless)
%CO =	0.00	%	percent CO by volume (dry basis) (dimensionless)
%Ar=	0.00	%	percent Ar by volume (dry basis) (dimensionless)
$\%N_2$ =	82.67	%	percent N_2 by volume (dry basis) (dimensionless)
A =	10.6795	ft^2	stack cross-sectional area
P_g =	-0.27	in. H_2O	flue gas static pressure
T_{savg} =	1937.28	R	average absolute flue gas temperature (460R+tsavg °F)
$SQ\Delta P_{avg}$ =	0.11	in. wg	average square root ΔP
ΔH =	1.00	in. wg	average pressure differential of orifice meter
T_m =	537.33	R	dry gas meter temperature (460R+tsavg °F)
V_m =	33.97	ft^3	volume of metered gas sample (dry actual cubic feet)

Calculated Stack Variables

Barometric pressure at sampling location

NOTE: Barometric pressure recorded at ground level

$$P_{sam} = P_{bar} - [(E_{sam} / 100 \text{ ft}) * 0.1 \text{ in. Hg}]$$

$$P_{sam} = 29.13 - ((45.0 / 100) * 0.1)$$

$$P_{sam} = 29.09 \text{ in. Hg}$$

Volume of dry gas sampled at standard conditions (dscf)

$$V_{mstd} = \gamma * Vm * [P_{bar} - ([(E_{box} / 100 \text{ ft}) * 0.1 \text{ in. Hg}] + (\Delta H / 13.6)) / P_{std}] * (T_{std} / T_m)$$

$$V_{mstd} = 1.0054 * 33.967 * ((29.13 - ((3.5 / 100) * 0.1) + (1.0000 / 13.6)) / 29.92) * (527.7 / 537.333)$$

$$V_{mstd} = 32.732 \text{ ft}^3$$

Volume of water vapor at standard conditions (68 °F, scf)

$$V_{wstd} = (0.04716 \text{ ft}^3/\text{g}) * Vlc$$

$$V_{wstd} = (0.04716 * 162.5)$$

$$V_{wstd} = 7.7 \text{ ft}^3$$

Percent moisture by volume as measured in flue gas

$\%H_2O$ (Measured) $= 100 * [V_{wstd} / (V_{wstd} + V_{mstd})]$

$\%H_2O$ (Measured) $= 100 * (7.664 / (7.664 + 32.732))$

$\%H_2O$ (Measured) $=$ 18.97

$\%H_2O$ (Saturated) $= (100 / P_{sam}) * 10 \wedge (6.6911 - (3144 / (T_{savg} + 390.86 - 460)))$

$\%H_2O$ (Saturated) $= (100 / 29.067969) * 10 \wedge (6.6911 - (3144 / (1{,}937.281250 + 390.86 - 460)))$

$\%H_2O$ (Saturated) $=$ 350613.85

$\%H_2O =$ 18.97

Absolute flue gas pressure

$P_s = P_{sam} + (Pg / 13.6)$

$P_s = 29.09 + (-0.27 / 13.6)$

$P_s =$ 29.07 in. Hg

Dry mole fraction of flue gas (dimensionless)

$M_{fd} = 1 - (\%H_2O / 100)$

$M_{fd} = 1 - (18.97 / 100)$

$M_{fd} =$ 0.810

Dry molecular weight of flue gas (lb/lb-mole)

$M_d = [(\%CO_2 / 100) * 44.0] + [(\%O_2 / 100) * 32.0] + [((100 - \%CO_2 - \%O_2) / 100) * 28.0]$

$M_d = ((5.00 / 100) * 44.0) + ((12.33 / 100) * 32.0) + (((100 - 5.00 - 12.33) / 100) * 28.0)$

$M_d =$ 29.29 lb/lb-mole

$M_d =$ 29.29

Wet molecular weight of flue gas (lb/lb-mole)

$M_s = M_d * M_{fd} + (H_2OF_{wt} * (\%H_2O / 100))$

$M_s = 29.293 * 0.810 + 18.02 * (18.97 / 100)$

$M_s =$ 27.15 lb/lb-mole

Average flue gas velocity (ft/sec)

$v_s = 85.49 * Cp * (SQ\Delta P_{avg}) * (T_{savg} / (P_s * M_s))^{0.5}$

$v_s = 85.49 * 0.84 * (0.1148) * (1{,}937.28 / (29.068 * 27.154)) \wedge 0.5$

$v_s =$ 12.91 ft/sec

Wet volumetric flue gas flow rate at actual conditions (acfm)

$Q_{aw} = v_s * A * 60$ sec/min

$Q_{aw} = 12.912 * 10.679 * 60$

$Q_{aw} =$ 8,273 ft^3/min

Wet volumetric flue gas flow rate at standard conditions (scfm)

$Q_{sdw} = v_s * A * (T_{std} / T_{savg}) * (P_s / P_{std}) * 60$ sec/min

$Q_{sdw} = 12.912 * 10.679 * (527.7 / 1{,}937.281) * (29.068 / 29.92) * 60$

$Q_{sdw} =$ 2,189 ft^3/min

Dry volumetric flue gas flow rate at standard conditions (dscfm)

$Q_{sd} = M_{fd} * v_s * A * (T_{std} / T_{savg}) * (P_s / P_{std}) * 60$ sec/min

$Q_{sd} = 0.810 * 12.9116 * 10.6795 * (527.7 / 1{,}937.281) * (29.068 / 29.92) * 60$

$Q_{sd} =$ 1,774 ft^3/min

Percent Excess Air

$\%EA = [\%O_2 - (0.5) * \%CO] / [0.264 * (100 - \%CO_2 - \%O_2) - (\%O_2 - 0.5 * \%CO)]$

$\%EA = ((12.33 - (0.5) * 0.00) / (0.264 * (100 - 5.00 - 12.33) - (12.33 - 0.5 * 0.00))) * 100$

%EA = 129.86 %

Method 25A Calculations

TGO concentration (ppmvw as methane)

TGOppmvw = 5.67 ppmvw as methane

TGO mass emission rate (lb/hr as methane)

MERTGO = (60 min/hr * TGO ppmvw * CH4wt * Qsdw) / (385.3 $ft^3 * 10^6$)

MERTGO = 0.0310 lb/hr (as methane)

APPENDIX B
FACILITY PROCESS DATA

Robert Sava

To: rsava@montrose-env.com
Subject: FW: [EXTERNAL] RE: Processing Information

From: Oblak, Doug [mailto:doug.oblak@synthomer.com]
Sent: Wednesday, June 16, 2021 4:00 PM
To: Robert Sava
Subject: [EXTERNAL] RE: Processing Information

Robert,
The first event (~0930) would have been Gencryl 9555, Batch 73925, Reactor 1 to 9 Blow down tank. Batch weight – 78,931 lbs. The transfer ran from 09:30 to ~09:55 according to my notes.

Event 2 (~11:07) was Gencryl 9555, Batch 73925, Reactor 3 to 9 Blow down tank. Batch weight – 79,010 lbs. The transfer ran from 11:07 to ~11:32 according to my notes.

Event 3 (~12:23) was Genflo 6849, Batch 73630, Reactor 2 to 10 Blow down tank. Batch weight – 77836 lbs. The transfer ran from 12:23 to and was still running at the end of the testing event.

Thanks again for all of your help. Let me know if you need additional info.

Doug Oblak | SHES Sr. Specialist | Akron & Mogadore |
Phone: 330-628-6443
E-Mail: doug.oblak@synthomer.com | Web: www.synthomer.com

Address: OMNOVA Solutions Inc., a Synthomer company | 165 S. Cleveland Ave, Mogadore OH 44260 | USA

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APPENDIX C
QUALITY ASSURANCE/QUALITY CONTROL

Appendix C.1
Units and Abbreviations

MONTROSE AIR QUALITY SERVICES

UNITS AND ABBREVIATIONS

@ X% O_2	corrected to X% oxygen (corrected for dilution air)
|CC|	absolute value of the confidence coefficient
|d|	absolute value of the mean differences
ºC	degrees Celsius (centrigade)
ºF	degrees Fahrenheit
ºR	degrees Rankine
" H_2O	inches of water column
13.6	specific gravity of mercury
ΔH	pressure drop across orifice meter, inches H_2O
ΔP	velocity head of stack gas, inches H_2O
θ	total sampling time, minutes
µg	microgram
ρ_a	density of acetone, mg/ml
ρ_w	density of water, 0.9982 g/ml or 0.002201 lb/ml
acfm	actual cubic feet of gas per minute at stack conditions
A_n	cross-sectional area of nozzle, ft^2
A_s	cross-sectional area of stack, square feet (ft^2)
Btu	British thermal unit
B_{ws}	proportion by volume of water vapor in gas stream
C_a	particulate matter concentration in stack gas, gr/acf
C_{Avg}	average unadjusted gas concentration, ppmv
C_{Dir}	measured concentration of calibration gas, ppmv
cf or ft^3	cubic feet
cfm	cubic feet per minute
C_{Gas}	average gas concentration adjusted for bias, ppmv
C_M	average of initial and final system bias check responses from upscale calibration gas, ppmv
cm or m^3	cubic meters
C_{MA}	actual concentration of the upscale calibration gas, ppmv
C_O	average of initial and final system bias check responses from low-level calibration gas, ppmv
C_p	pitot tube coefficient
C_s	particulate matter concentration in stack gas, gr/dscf
CS	calibration span, % or ppmv
C_S	measured concentration of calibration gas, ppmv
C_V	manufactured certified concentration of calibration gas, ppmv
D	drift assessment, % of span
dcf	dry cubic feet
dcm	dry cubic meters
D_n	diameter of nozzle, inches
D_s	diameter of stack, inches
dscf	dry standard cubic feet
dscfm	dry standard cubic feet per minute
dscm	dry standard cubic meters
F_d	F-factor, dscf/MMBtu of heat input
fpm	feet per minute
fps	feet per second
ft	feet
ft^2	square feet
g	gram
gal	gallons
gr	grains (7000 grains per pound)

UNITS AND ABBREVIATIONS

gr/dscf	grains per dry standard cubic feet
hr	hour
I	percent of isokinetic sampling
in	inch
k	kilo or thousand (metric units, multiply by 10^3)
K	kelvin (temperature)
K_3	conversion factor 0.0154 gr/mg
K_4	conversion factor 0.002668 ((in. Hg)(ft^3))/((ml)(°R))
kg	kilogram
K_p	pitot tube constant (85.49 ft/sec)
kwscfh	thousand wet standard cubic feet per hour
l	liters
lb/hr	pounds per hour
lb/MMBtu	pounds per million Btu
lpm	liters per minute
m	meter or milli
M	thousand (English units) or mega (million, metric units)
m^3	cubic meters
m_a	mass of residue of acetone after evaporation, mg
M_d	molecular weight of stack gas; dry basis, lb/lb-mole
meq	milliequivalent
mg	milligram
Mg	megagram (10^6 grams)
min	minute
ml or mL	milliliter
mm	millimeter
MM	million (English units)
MMBtu/hr	million Btu per hour
m_n	total amount of particulate matter collected, mg
mol	mole
mol. wt. or MW	molecular weight
M_s	molecular weight of stack gas; wet basis, lb/lb-mole
MW	molecular weight or megawatt
n	number of data points
ng	nanogram
nm	nanometer
P_{bar}	barometric pressure, inches Hg
pg	picogram
P_g	stack static pressure, inches H_2O
P_m	barometric pressure of dry gas meter, inches Hg
ppb	parts per billion
ppbv	parts per billion, by volume
ppbvd	parts per billion by volume, dry basis
ppm	parts per million
ppmv	parts per million, by volume
ppmvd	parts per million by volume, dry basis
P_s	absolute stack gas pressure, inches Hg
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
P_{std}	standard absolute pressure, 29.92 inches Hg
Q_a	volumetric flow rate, actual conditions, acfm

MONTROSE AIR QUALITY SERVICES

UNITS AND ABBREVIATIONS

Q_s	volumetric flow rate, standard conditions, scfm
Q_{std}	volumetric flow rate, dry standard conditions, dscfm
R	ideal gas constant 21.85 ((in. Hg) ($ft^{3)}$)/((°R) (lbmole))
SB_{final}	post-run system bias check, % of span
SB_i	pre-run system bias check, % of span
scf	standard cubic feet
scfh	standard cubic feet per hour
scfm	standard cubic feet per minute
scm	standard cubic meters
scmh	standard cubic meters per hour
sec	second
sf, sq. ft., or ft^2	square feet
std	standard
t	metric ton (1000 kg)
$T_{0.975}$	t-value
T_a	absolute average ambient temperature, ºR (+459.67 for English)
T_m	absolute average dry gas meter temperature, ºR (+459.67 for English)
ton or t	ton = 2000 pounds
tph or tons/hr	tons per hour
tpy or tons/yr	tons per year
T_s	absolute average stack gas meter temperature, ºR (+459.67 for English)
T_{std}	absolute temperature at standard conditions
V	volt
V_a	volume of acetone blank, ml
V_{aw}	volume of acetone used in wash, ml
V_{lc}	total volume H_2O collected in impingers and silica gel, grams
V_m	volume of gas sampled through dry gas meter, ft^3
$V_{m(std)}$	volume of gas measured by the dry gas meter, corrected to standard conditions, dscf
V_{ma}	stack gas volume sampled, acf
V_n	volume collected at stack conditions through nozzle, acf
V_s	average stack gas velocity, feet per second
$V_{wc(std)}$	volume of water vapor condensed, corrected to standard conditions, scf
$V_{wi(std)}$	volume of water vapor in gas sampled from impingers, scf
$V_{wsg(std)}$	volume of water vapor in gas sampled from silica gel, scf
W	watt
W_a	weight of residue in acetone wash, mg
W_{imp}	total weight of impingers, grams
W_{sg}	total weight of silica gel, grams
Y	dry gas meter calibration factor, dimensionless

ACRONYMS

AAS	atomic absorption spectroscopy
ACDP	air contaminant discharge permit
ACE	analyzer calibration error, percent of span
AD	absolute difference
ADL	above detection limit
AETB	Air Emissions Testing Body
AS	applicable standard (emission limit)
ASTM	American Society For Testing And Materials
BACT	best achievable control technology
BDL	below detection limit
BHP	brake horsepower
BIF	boiler and industrial furnace
BLS	black liquor solids
CC	confidence coefficient
CD	calibration drift
CE	calibration error
CEM	continuous emissions monitor
CEMS	continuous emissions monitoring system
CERMS	continuous emissions rate monitoring system
CET	calibration error test
CFR	Code of Federal Regulations
CGA	cylinder gas audit
CHNOS	elemental analysis for determination of C, H, N, O, and S content in fuels
CNCG	concentrated non-condensable gas
CO	catalytic oxidizer
COC	chain of custody
COMS	continuous opacity monitoring system
CPM	condensible particulate matter
CPMS	continuous parameter monitoring system
CT	combustion turbine
CTM	conditional test method
CTO	catalytic thermal oxidizer
CVAAS	cold vapor atomic absorption spectroscopy
D_e	equivalent diameter
DE	destruction efficiency
Dioxins	polychlorinated dibenzo-p-dioxins (pcdd's)
DLL	detection level limited
DNCG	dilute non-condensable gas
ECD	electron capture detector
EIT	Engineer In Training
ELCD	electoconductivity detector (hall detector)
EMPC	estimated maximum possible concentration
EPA	US Environmental Protection Agency
EPRI	Electric Power Research Institute
ES	emission standard (applicable limit)
ESP	electrostatic precipitator
EU	emission unit
FCCU	fluid catalytic cracking unit
FGD	flue gas desulfurization
FI	flame ionization
FIA	flame ionization analyzer
FID	flame ionization detector
FPD	flame photometric detector
FPM	filterable particulate matter

ACRONYMS

FTIR	Fourier-transform infrared spectroscopy
FTPB	field train proof blank
FTRB	field train recovery blank
Furans	polychlorinated dibenzofurans (pcdf's)
GC	gas chromatography
GC/MS	gas chromatography/mass spectroscopy
GFAAS	graphite furnace atomic absorption spectroscopy
GFC	gas filter correlation
GHG	greenhouse gas
HAP	hazardous air pollutant
HC	hydrocarbons
HHV	higher heating value
HPLC	high performance liquid chromatography
HRGC/HRMS	high-resolution gas chromatography/high-resolution mass spectroscopy
HRSG	heat recovery steam generator
IC	ion chromatography
ICAP	inductively-coupled argon plasmography
ICPCR	ion chromatography with a post-column reactor
ICP-MS	inductively coupled plasma-mass spectroscopy
IR	infrared radiation
ISO	International Standards Organization
kW	kilowatts
LFG	landfill gas
LHV	lower heating value
LPG	liquified petroleum gas
MACT	maximum achievable control technology
MDI	methylene diphyenyl diisocyanate
MDL	method detection limit
MNOC	maximum normal operating conditions
MRL	method reporting limit
MS	mass spectrometry
NA	not applicable or not available
NCASI	National Council For Air And Steam Improvement
NCG	non-condensable gases
ND	not detected
NDIR	non-dispersive infrared
NESHAP	National Emissions Standards For Hazardous Air Pollutants
NG	natural gas
NIOSH	National Institute For Occupational Safety And Health
NIST	National Institute Of Standards And Technology
NMC	non-methane cutter
NMOC	non-methane organic compounds
NMVOC	non-methane volatile organic compounds
NPD	nitrogen phosphorus detector
NSPS	New Source Performance Standards
OSHA	Occupational Safety And Health Administration
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl compounds
PCWP	plywood and composite wood products
PE	Professional Engineer
PFAS	per- and polyfluoroalkyl substances (PFAS)
PI	photoionization
PID	photoionization detector
PM	particulate matter

ACRONYMS

PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
POM	polycyclic organic matter
PS	performance specification
PSD	particle size distribution
PSEL	plant site emission limits
PST	performance specification test
PTE	permanent total enclosure
PTM	performance test method
QA/QC	quality assurance and quality control
QI	Qualified Individual
QSTI	Qualified Source Testing Individual
RA	relative accuracy
RAA	relative accuracy audit
RACT	reasonably available control technology
RATA	relative accuracy test audit
RCTO	rotary concentrator thermal oxidizer
RICE	stationary reciprocating internal combustion engine
RM	reference method
RTO	regenerative thermal oxidizer
SAM	sulfuric acid mist
SCD	sulfur chemiluminescent detector
SCR	selective catalytic reduction system
SD	standard deviation
Semi-VOST	semivolatile organic compounds sample train
SRM	standard reference material
TAP	toxic air pollutant
TBD	to be determined
TCA	thermal conductivity analyzer
TCD	thermal conductivity detector
TGNENMOC	total gaseous non-ethane non-methane organic compounds
TGNMOC	total gaseous non-methane organic compounds
TGOC	total gaseous organic compounds
THC	total hydrocarbons
TIC	tentatively identified compound
TO	thermal oxidizer
TO	toxic organic (as in EPA Method TO-15)
TPM	total particulate matter
TSP	total suspended particulate matter
TTE	temporary total enclosure
ULSD	ultra-low sulfur diesel
UV	ultraviolet radiation range
VE	visible emissions
VOC	volatile organic compounds
VOST	volatile organic sample train
WC	water column
WWTP	waste water treatment plant

MONTROSE
AIR QUALITY SERVICES

CHEMICAL NOMENCLATURE

Ag	silver
As	arsenic
Ba	barium
Be	beryllium
C	carbon
Cd	cadmium
CdS	cadmium sulfide
CH_2O	formaldehyde
CH_3CHO	acetaldehyde
CH_3OH	methanol
CH_4	methane
C_2H_4O	ethylene oxide
C_2H_6	ethane
C_3H_4O	acrolein
C_3H_6O	propionaldehyde
C_3H_8	propane
C_6H_5OH	phenol
Cl_2	chlorine
ClO_2	chlorine dioxide
CO	carbon monoxide
Co	cobalt
CO_2	carbon dioxide
Cr	chromium
Cu	copper
EtO	ethylene oxide
EtOH	ethyl alcohol (ethanol)
H_2	hydrogen
H_2O	water
H_2O_2	hydrogen peroxide
H_2S	hydrogen sulfide
H_2SO_4	sulfuric acid
HCl	hydrogen chloride
Hg	mercury
IPA	isopropyl alcohol
MDI	methylene diphyenyl diisocyanate
$MeCl_2$	methylene chloride
MEK	methyl ethyl ketone
MeOH	methanol
Mn	manganese
N_2	nitrogen
NH_3	ammonia
Ni	nickel
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_2	oxygen
P	phosphorus
Pb	lead
PCDD	polychlorinated dibenzo-p-dioxins
PCDF	polychlorinated dibenzofurans
Sb	antimony
Se	selenium
SO_2	sulfur dioxide
SO_3	sulfur trioxide
SO_x	sulfur oxides
TCDD	tetrachlorodibenzodioxin
TCDF	tetrachlorodibenzofuran
TGOC	total gaseous organic concentration
THC	total hydrocarbons
Tl	thallium
TRS	total reduced sulfur compounds
Zn	zinc

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Appendix C.2
Manual Test Method QA/QC Data

US EPA METHOD 4 SAMPLING TRAIN AUDIT

Parameter	Run 1	Run 2	Run 3
Sampling Location	**P004 T-OX Exhaust Stack**		
Post-Test Leak Rate Observed (cfm)	0.000	0.000	0.000
Applicable Method Allowable Leak Rate (cfm)	0.020	0.020	0.020
Acceptable	YES	YES	YES
Volume of Dry Gas Collected (dscf)	32.423	32.398	32.553
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	YES	YES	YES

US EPA METHOD 4 DRY GAS METER (DGM) AUDIT

Parameter	
Sampling Location	**P004 T-OX Exhaust Stack**
Pre-Test DGM Calibrtaion Factor (Y)	1.005
Average Post-Test DGM Calibration Check Value (Yqa)	1.000
Post-Test DGM Calibration Check Value Difference from Pre-Test Calibration Factor (%)	0.560%
Applicable Method Allowable Difference (%)	5.00%
Acceptable	YES

US EPA METHOD 3 FYRITE AUDIT

Audit Date	**June 8, 2021**	
Audit Gas	**%CO_2**	**%O_2**
Audit Gas Concentration (%)	**6.1**	**6.0**
Fyrite Response 1 (%)	6.3	6.5
Fyrite Response 2 (%)	6.3	6.5
Fyrite Response 3 (%)	6.3	6.5
Average (%)	6.3	6.5
Average Within ±0.5%	YES	YES

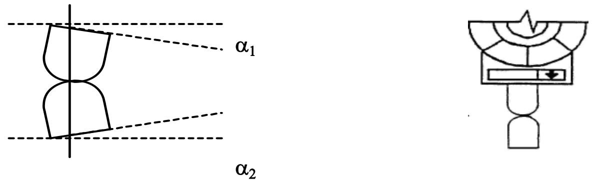
Audit Gas Cylinder Number: ALM-017673

Type S Pitot Tube Inspection

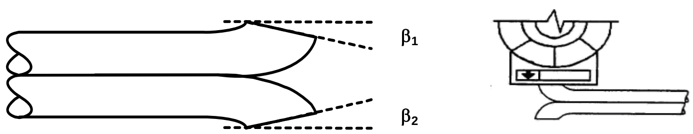
Protractor ID:	C- DPR1-005
Measuring Tape ID:	C- 12T6-005
Caliper ID:	C- CLP3-005

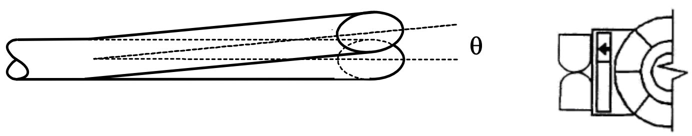
Alignment and Tubing Dimensions

Probe / Pitot ID	T - PRB I63
Modular Pitot ID	NA
M201A PM10 Assembly ID	NA
M201A PM2.5 Assembly ID	NA
Level and Perpendicular	☑
No Obstructions	☑
No Damage	☑
α_1 $(-10° < \alpha_1 < +10°)$	1.0
α_2 $(-10° < \alpha_2 < +10°)$	0.0
β_1 $(-5° < \beta_1 < +5°)$	0.0
β_2 $(-5° < \beta_2 < +5°)$	2.0
γ	1.0
θ	0.0
A	0.8820
z= A tan γ (± 0.125")	0.015
w= A tan θ (± 0.03125")	0.000
D_t (0.1875" < D_t < 0.375")	0.3750
P_A (1.05D_t < P_A < 1.5D_t)	0.4330
P_B (1.05D_t < P_B < 1.5D_t)	0.4490
$P_A = P_B \pm 0.0625$	-0.0160

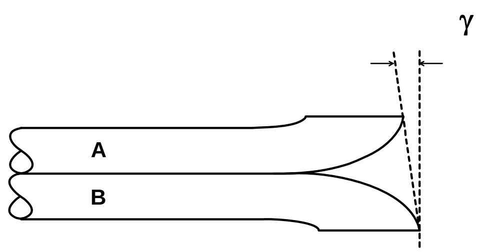


Degree indicating level position for determining α_1 and α_2.

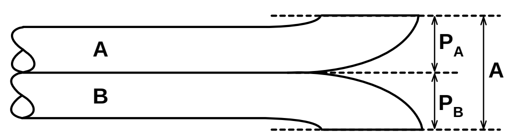




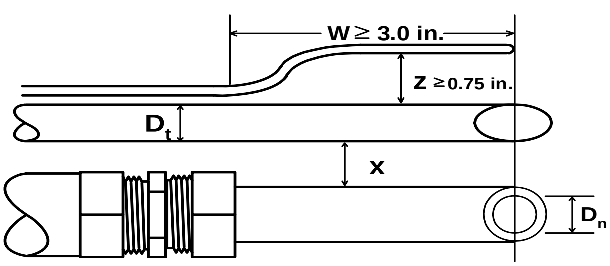
Degree indicating level position for determining θ.



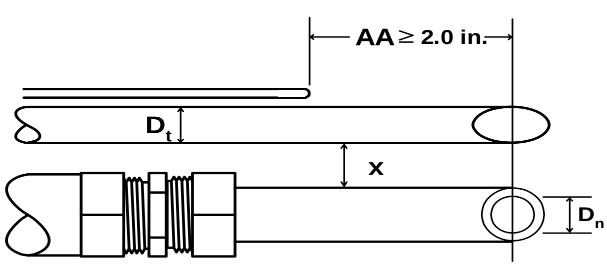
Degree indicating level position for determining γ then calculating Z.

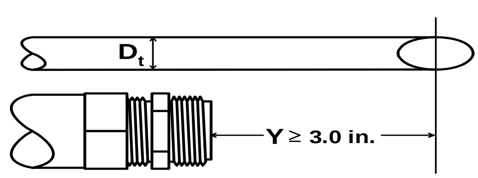


Assembly Inter-Component Spacing Requirements



Effective Length (in.)	62.80
W (≥ 3.0")	-
-or- AA (≥ 2.0")	2.000
X	1.050
D_n	0.493
X / D_n (≥ 1.5)	2.130
Y (≥ 3.0")	3.300
Z ≥ 0.75"	-



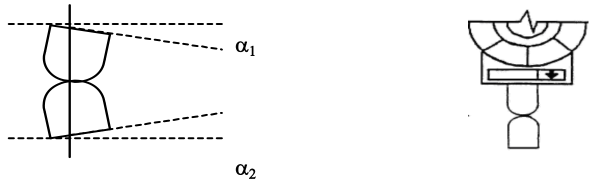


Done By: JG
Date: 5/11/2021 10:45

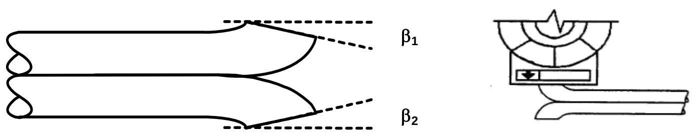
Type S Pitot Tube Inspection

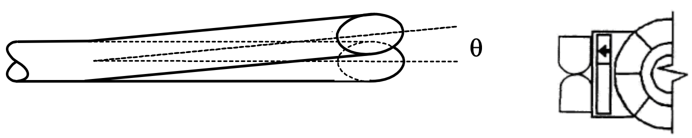
Protractor ID: C- DPR1-005
Measuring Tape ID: C- 12T6-005
Caliper ID: C- CLP3-005

Alignment and Tubing Dimensions

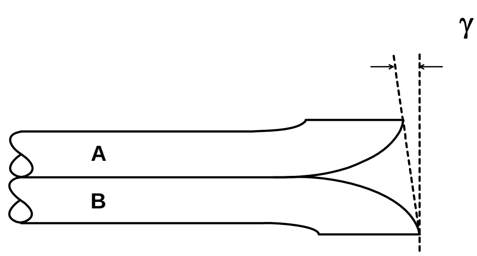


Degree indicating level position for determining α_1 and α_2.



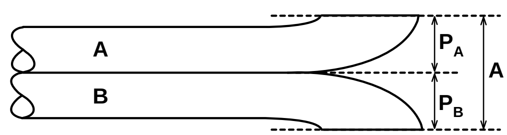


Degree indicating level position for determining θ.

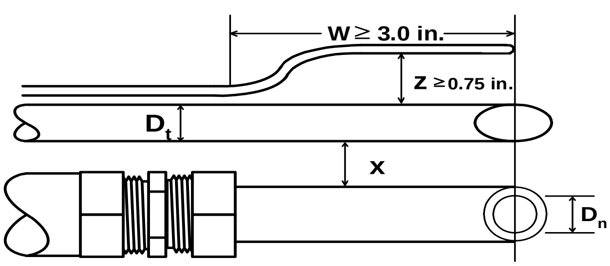


Degree indicating level position for determining γ then calculating Z.

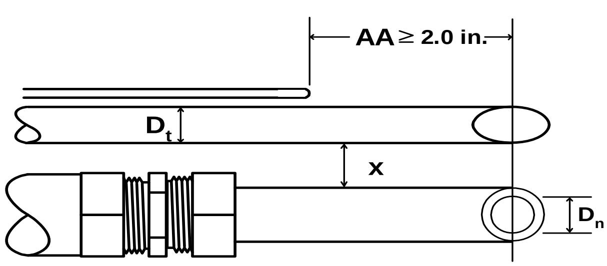
Probe / Pitot ID	T - PRB I63
Modular Pitot ID	NA
M201A PM10 Assembly ID	NA
M201A PM2.5 Assembly ID	NA
Level and Perpendicular	☑
No Obstructions	☑
No Damage	☑
α_1 $(-10° < \alpha_1 < +10°)$	0.5
α_2 $(-10° < \alpha_2 < +10°)$	0.5
β_1 $(-5° < \beta_1 < +5°)$	1.0
β_2 $(-5° < \beta_2 < +5°)$	2.0
γ	1.5
θ	0.0
A	0.8810
z= A tan γ (± 0.125")	0.023
w= A tan θ (± 0.03125")	0.000
D_t (0.1875" < D_t < 0.375")	0.3750
P_A $(1.05D_t < P_A < 1.5D_t)$	0.4260
P_B $(1.05D_t < P_B < 1.5D_t)$	0.4550
$P_A = P_B \pm 0.0625$	-0.0290

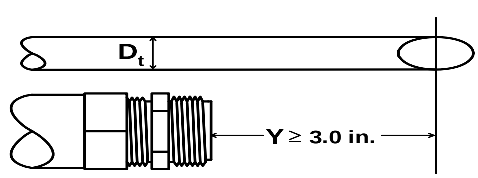


Assembly Inter-Component Spacing Requirements



Effective Length (in.)	62.80
W (≥ 3.0")	-
-or- AA (≥ 2.0")	2.000
X	1.000
D_n	0.493
X / D_n (≥ 1.5)	2.028
Y (≥ 3.0")	3.300
Z ≥ 0.75"	-





Done By: JG
Date: 6/9/2021 12:38

Meter Box I.D: T-MTB- **004**

Reference Thermometer I.D: RF-THC - 009

Trendicator Setting (°F)	Probe	Stack	Filter	Exit	Aux
50	50	50	50	50	50
100	100	100	100	100	100
200	201	201	201	201	201
300	301	301	301	**-**	301
400	400	400	400	**-**	400
600	**-**	600	-	**-**	-
800	**-**	800	-	-	-
1000	**-**	1000	-	-	-
1500	**-**	1500	-	-	-

* Tolerance = ±2 (°F)

Done By: MM
Date: 5/26/2021 13:14

Post-Test Thermocouple Audit

Job Number: 008887

Temperature Display 1 ID:	T-MTB- 004
Temperature Display 2 ID:	
Reference Thermometer ID-1 (T1):	RF-THC- 009
Reference Thermometer ID-2 (T2):	
Umbilical ID:	T-UMC- 103
Umbilical ID:	T-M2U- 201
Umbilical ID:	
Umbilical ID:	

Continuity Check:	☑

Stack Thermocouple (T_S) Audit

Audit	Thermocouple ID	T_s (°F)	$T_{Reference}$ (°F)	± 2°F	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1	T-PRB- I63	76	76	0	T1	Pass	JG	06/09/21
							Checked by	Date
							JG	06/09/21

Probe Thermocouple (T_{PRB}) Audit

Audit	Thermocouple ID	T_{PRB} (°F)	$T_{Reference}$ (°F)	± 2°F	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1				-	-			
							Checked by	Date

Umbilical Adapter Thermocouple (T_{UMA}) Audit

Audit	Adapter ID	T_{UMA} (°F)	$T_{Reference}$ (°F)	± 2°F	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1	T-UMA- 032	76	76	0	T1	Pass	JG	06/09/21
							Checked by	Date
							JG	06/09/21

Thermocouple (T_{TC}) Audit

Audit	Thermocouple ID	T_{TC} (°F)	$T_{Reference}$ (°F)	± 2°F	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1				-	-			
							Checked by	Date

Post-Test Thermocouple Audit

Job Number: 008887

Temperature Display 1 ID:	T-MTB- 004
Temperature Display 2 ID:	
Reference Thermometer ID-1 (T1):	RF-THC- 009
Reference Thermometer ID-2 (T2):	
Umbilical ID:	T-UMC- 103
Umbilical ID:	T-M2U- 201
Umbilical ID:	
Umbilical ID:	

Continuity Check:	☑

Meterbox Thermocouple (T_{MTB}) Audit

Audit	Meterbox ID	T_{MTB} (^oF)	$T_{Reference}$ (^oF)	± 2^oF	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1	T-MTB- 004	76	76	0	T1	Pass	JG	06/09/21
							Checked by	Date
							JG	06/09/21

Filter Box Thermocouple (T_{FLB}) Audit

Audit	Filter Box ID	T_{FLB} (^oF)	$T_{Reference}$ (^oF)	± 2^oF	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1				-	-			
							Checked by	Date

Detached Sample Line (T_{DM4L}) Audit

Audit	Detached Line ID	T_{DM4L} (^oF)	$T_{Reference}$ (^oF)	± 2^oF	$T_{Reference}$ ID	Pass/Fail	Performed by	Date
1				-	-			
							Checked by	Date

Orifice Plate Inspection Form

Job Number: 789652
Tolerance: +/- 0.001"

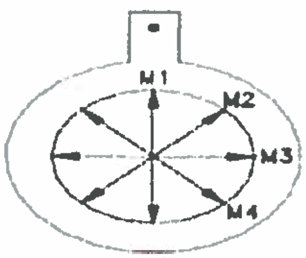
Date Reported: 5/12/2021
Size: 4"

Flange Rating: 300#
Tag Number: N/A

Material Grade: 304SS
Orifice Plate Thickness: 1/8"

Type (e.g.: Concentric, quadrant edge, eccentric) Concentric

Orifice Plate Inspection Data

Diagram	> MS = Avg. - MX, x = 1,2,3,4		
	M1 =	3.532	>M1
	M2 =	3.532	>M2
	M3 =	3.532	>M3
	M4 =	3.532	>M4
	Average	3.532	(M1 + M2 + M3 + M4)/4
	> Maximum	3.532	Per table 2)
	Print OD	7.125	Tolerance +/- 1/16
	OD Reading	7.129	

Replace orifice plates if any > MX is greater than > Maximum.

Replace : Yes No

Comments

Caliper Used: (SN:8434)

Quality Control Acceptance

Quality Control Inspector: Edward Curtis

Quality Control Supervisor:

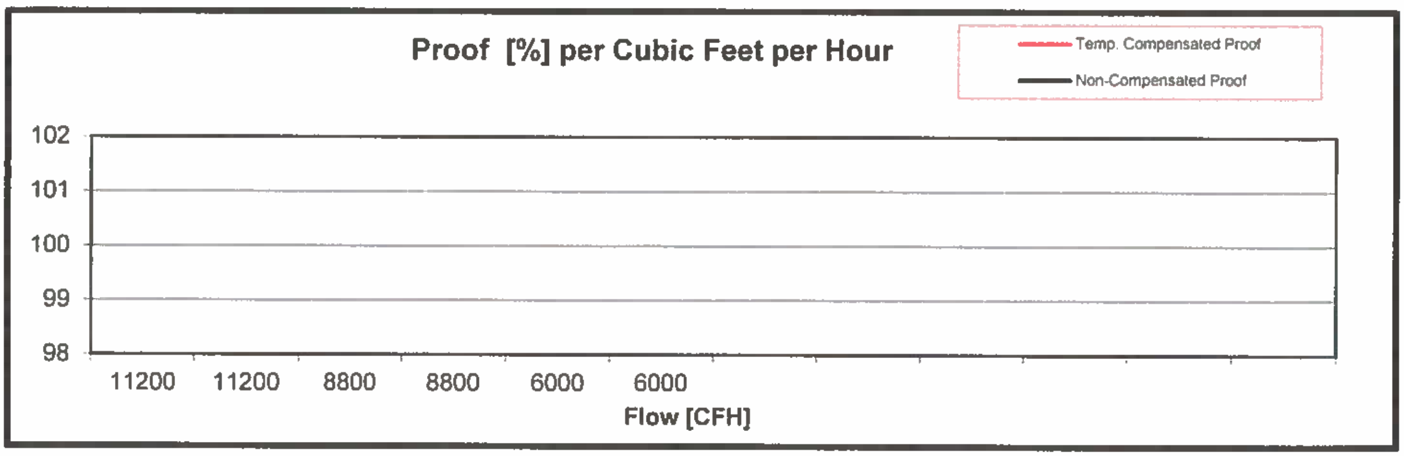
IMAC Systems, Inc.
International Measurement and Control Systems

90 Main Street • P.O. Box 1605
Tullytown, Pennsylvania 19007
Tel: 215-946-2200 • Fax: 215-943-2984
E-mail: sales@imacsystems.com
Web site: www.imacsystems.com

Gas Meter Certificate of Proof

Meter Model:	4" ANSI 300 Orifice Plate	**Test Setup:**	Verification
Information:	304SS U11430, Bore 3.532"	**Output Drive Rate:**	N/A
Sales Order #:	98575	**Type of Test:**	Diff. Test
Leak Test (psig):	N/A	**Test Temp °F:**	70
P Max (psig):	720	**Mounting Position:**	N/A
Customer Name:	Omnova Solutions	**Rated Capacity:**	N/A
Customer PO#:	V-21-AS-01	**Pulse Out Value:**	N/A

% Rated Capacity	Flow Rate [CFH]	Temp. Compensated Proof	Diff. Press. [inW.C.]	Non-Compensated Proof
	11200		1.3	
	11200		1.3	
	8800		0.8	
	8800		0.8	
	6000		0.4	
	6000		0.4	



A/L Temp. Comp:	N/A	**TC Test % Error:**	N/A
A/L Non-Comp:	N/A	**Prover Type:**	American Meter 12m Transfer Prover

Arnold Barlow
Verified By

5/18/2021
Test Date

Method 4.xls Pre-Test Orifice Meter Check

- [x] Assemble meter box - level / zero the manometer
- [x] Operate the meter box at the ΔH@ pressure differential for at least **10 minutes**.
  The ΔH@ number is taken from the meter console calibration sheet or the tag.
  During the warm-up period, verify flow through the Method 3 flowmeter.
- [x] Record the dry gas meter volume, meter temperatures and barometric pressure (mmHg).

Meter Box ID **T-MTB-** 004
Pump ID **T-PMP-** 016

Calibration Date 5-26-21
Barometric Pressure (mmHg) 732

Gamma (γ) 1.0054
ΔH@ 1.820

Initial Dry Gas Meter Volume (cf) 820.0
Final Dry Gas Meter Volume (cf) 827.655

Time (min)	Meter In (°F)	Meter Out (°F)
2	—	81
4	—	81
6	—	81
8	—	82
10	—	82

- [x] Calculate the Dry Gas Meter Calibration Value (γ_c) and compare γ_c against the Dry Gas Meter Calibration Factor (γ) to determine if $\gamma_c = \gamma$ ±3%

- [x] If the γ_c is not within this range, the Meter Box should be investigated before beginning the test.

Job Number: PROJ-008887
Done By / Date: [illegible] / 6-7-21
Checked By / Date: — / — : [illegible] / —
Final Check By / Date: RS / 6-8-21

US EPA Method 4 Pre-Test In-Field Meter Orifice Check

US EPA Method X Sampling Train

Meter Box ID	**T-MTB-004**
Calibration Date	**5/26/2021**

γ =	**1.0054**
$\Delta H@$ =	**1.820**

Barometric Pressure, $Pbar_{mmHg}$ (mmHg)	**732**
Barometric Pressure, $Pbar_{inHg}$ (inHg)	**28.82**

Time (min)	Meter Volume (ft^3)
0	**820.000**
10	**827.655**
Net Volume, Vm (ft^3)	**7.655**

Time (min)	Meter In (°F)	Meter Out (°F)
2	**-**	**81**
4	**-**	**81**
6	**-**	**81**
8	**-**	**82**
10	**-**	**85**
	Average, Tm (^oF)	**82**

Dry Gas Meter Calibration (γ_c) Calculation

$$\gamma_c = (10 / Vm) * [0.0319 * ((Tm + 460) / Pbar_{inHg})]^{1/2}$$

$$0.97(\gamma) < \gamma_c < 1.03(\gamma)$$

$$0.9752 < \mathbf{1.0119} < 1.0356$$

PASS

Meter Box Pre-Test Leak Check

- ☑ Remove the front panel from the meter box
- ☑ Disconnect the fan
- ☑ Hook up the proper pump to the meter box
- ☑ Close both the fine and coarse adjustment valves
- ☑ Connect the DH hoses on the front of the meter box
- ☑ Remove the copper elbow from stainless tube at the exit side of gas meter
- ☑ Stopper the stainless tube with a rubber stopper
- ☑ Disconnect the DH static line from the orifice (bottom)
- ☑ Plug in leak check tube into the static side of the orifice
- ☑ Blowing into the leak check tube, pressurize the system to 5-7 inches and clamp off
- ☑ Hold for one minute
- ☑ No leakage should occur. If leak is present, it must be corrected
- ☑ Affix (w/ electrical tape) the copper elbow onto the stainless tube at the exit side of gas meter
- ☑ Reassemble meter box
- ☑ Plug in capped swagelok stem at sample inlet
- ☑ Start pump, bringing system vacuum to at least 15 in. Hg
- ☑ Note DGM reading, start timer
- ☑ Observe DGM for one minute
- ☑ No leakage should occur. If leak is present, it must be corrected
- ☑ Check oil wick position (should be 1/4" above the black O-ring)
- ☑ Check pump oil level (should be at fill line)

Meter Box Number T-MTB- 004

Pump Number T-PMP- 016

Done By: MM
Date: 5/26/2021 13:14

Method 4 Pre-Test Meter Calculation Orifice Calibration Data

Meter Box I.D:	T-MTB- **004**
Standard Meter I.D:	RF-DGM -006
Temp Sensor I.D:	RF-DGM -006
Barometer I.D:	RF-DPG -001
Meter Box Level?	☑

Standard Meter

Calibrated By:	Apex Instruments Inc.
Calibration Date:	February 2, 2021
Gamma:	0.9979
Serial Number:	1512377

REMOVE CAPS FROM STANDARD METER

Run 1

Pressures

ΔH:	1	in.H_20
Meter Box Vac:	5	in.Hg
P Bar:	730	mm.Hg

Meter Readings

	Time	Std Meter	Meter Box
Begin	0	879.921	766.092
End	12	886.811	772.923
Net	12	6.890	6.831

(>5.0 dcf)

Temperatures

Time (min)	Std Meter In	Std Meter Out	Meter Box In	Meter Box Out
4	75	75		78
8	76	76		79
12	76	76		79
Avg.	76		79	

Run 2

Pressures

ΔH:	2	in.H_20
Meter Box Vac:	5	in.Hg
P Bar:	730	mm.Hg

Meter Readings

	Time	Std Meter	Meter Box
Begin	0	887.094	773.195
End	12	896.601	782.647
Net	12	9.507	9.452

(>5.0 dcf)

Temperatures

Time (min)	Std Meter In	Std Meter Out	Meter Box In	Meter Box Out
4	75	76		77
8	74	75		77
12	74	74		78
Avg.	75		77	

Run 3

Pressures

ΔH:	3	in.H_20
Meter Box Vac:	5	in.Hg
P Bar:	730	mm.Hg

Meter Readings

	Time	Std Meter	Meter Box
Begin	0	896.932	782.976
End	12	908.820	794.807
Net	12	11.888	11.831

(>5.0 dcf)

Temperatures

Time (min)	Std Meter In	Std Meter Out	Meter Box In	Meter Box Out
4	74	74		78
8	74	74		78
12	74	74		79
Avg.	74		78	

ΔH:	$\Delta H_@$	γ
1	1.790	1.0096
2	1.878	1.0036
3	1.794	1.0031
AVG.	1.820	1.0054

Done By: MM
Date: 5/26/2021 13:14

Method 4 Pre-Test Meter Console Calibration

Run No.	Calibration Meter Correction Factor (Yc)	Barometric Press. (Pb) (in.Hg)	Delta H (in w.g.)	Meter Box Volume (Vd) (cu.ft.)	Average Meter Box Temperature (Tm) (F)	Standard Meter Volume (Vc) (cu.ft.)	Standard Meter Temperature (Tc) (F)	Time (min.)	Gamma (Y)	Tolerance (plus or minus 0.02)	Delta H@	Tolerance (plus or minus 0.2)
1	0.9979	28.74	1	6.831	79	6.890	76	12	1.0096	0.004141	1.790	-0.031
2	0.9979	28.74	2	9.452	77	9.507	75	12	1.0036	-0.001854	1.878	0.057
3	0.9979	28.74	3	11.831	78	11.888	74	12	1.0031	-0.002287	1.794	-0.027
										PASS		PASS
							Average		1.0054		1.820	

Pump Number T-PMP- 016

Meter Box Number T-MTB- 004

Reference Meter Number RF-DGM- 006

Add Values to 30 Day Calibration History
Add Values to Dry Gas Meter Calibration History
Tag Meter Box

Done By: MM
Date: 5/26/2021 13:14

ALT-009 Post-Test Leak Check

NOTE: Do not perform leak check if meter failed ALT-009 requirements.

- ☑ Remove the front panel from the meter box
- ☐ Disconnect the fan
- ☑ Hook up the proper pump to the meter box
- ☑ Close both the fine and coarse adjustment valves
- ☑ Connect the DH hoses on the front of the meter box
- ☑ Remove the copper elbow from stainless tube at the exit side of gas meter
- ☑ Stopper the stainless tube with a rubber stopper
- ☑ Disconnect the DH static line from the orifice (bottom)
- ☑ Plug in leak check tube into the static side of the orifice
- ☑ Blowing into the leak check tube, pressurize the system to 5-7 inches and clamp off
- ☑ Hold for one minute
- ☑ No leakage should occur.
- ☑ Affix (w/ electrical tape) the copper elbow onto the stainless tube at the exit side of gas meter
- ☑ Reassemble meter box

Meter Box Number T-MTB- 004

Pump Number T-PMP- 008

Job Number: 008887

Done By / Date: JG / 06/09/2021

Calibration Kit Audit

Hygrometer ID: RF-HGR-007

Calibration Kit ID: C-CKT- 002

Temperature (°F): 74

Date: 6/9/21

Relative Humidity (%): 75

Job Number: 008887

Initials: JG

Caliper (Tolerance: ± 0.001")

Reference CLP ID: RF-CLP-001

	Reading 1 (")	Reading 2 (")	Reading 3 (")	AVG
Reference Nozzle 1	0.123	0.123	0.123	0.123
Reference Nozzle 2	0.252	0.252	0.252	0.252
Reference Nozzle 3	0.503	0.503	0.503	0.503

CLP ID: C-CLP2- 002

	As Found Reading 1 (")	As found Reading 2 (")	As Found Reading 3 (")	AVG	Tolerance (Pass/Fail)
Reference Nozzle 1	0.124	0.123	0.124	0.124	PASS
Reference Nozzle 2	0.253	0.253	0.253	0.253	PASS
Reference Nozzle 3	0.504	0.504	0.504	0.504	PASS

Digital Protractor (Tolerance: ± 1°)

Reference DPR ID: RF-DPR-001

DPR1 ID: C-DPR1- 002

	Reference DPR (°)	As Found DPR1 (°)	Tolerance (Pass/Fail)	Adjustment (Yes/No)	As Left DPR1 (°)
Reference Angle 1	5.0	5.1	PASS	NO	SAME
Reference Angle 2	10.0	10.0	PASS	NO	SAME
Reference Angle 3	20.0	20.0	PASS	NO	SAME

DPR2 ID: C-DPR2- 002

	Reference DPR (°)	As Found DPR2 (°)	Tolerance (Pass/Fail)	Adjustment (Yes/No)	As Left DPR2 (°)
Reference Angle 1	5.0	4.9	PASS	NO	SAME
Reference Angle 2	10.0	10.0	PASS	NO	SAME
Reference Angle 3	20.0	19.9	PASS	NO	SAME

Steel Protractor (Tolerance: ± 1°)

Reference DPR ID: RF-DPR-001

SPR1 ID: C-SPR1- 002

	Reference DPR (°)	As Found SPR1 (°)	Tolerance (Pass/Fail)
Reference Angle 1	5.0	5.1	PASS
Reference Angle 2	10.0	10.1	PASS
Reference Angle 3	20.0	20.1	PASS

SPR2 ID: C-SPR2- 002

	Reference DPR (°)	As Found SPR2 (°)	Tolerance (Pass/Fail)
Reference Angle 1	5.0	5.0	PASS
Reference Angle 2	10.0	10.1	PASS
Reference Angle 3	20.0	20.1	PASS

Calibration Kit Audit

12' Tape Measure (Tolerance: ± 0.1")

Reference RULE ID: RF-RUL-001

12T2 ID: C-12T5- 002

Reference Rule (")	As Found 12T1 (")	Tolerance (Pass/Fail)
3.000	3.000	PASS
12.000	12.000	PASS
48.000	48.000	PASS

12T2 ID: C-12T8- 002

Reference Rule (")	As Found 12T2 (")	Tolerance (Pass/Fail)
3.000	3.000	PASS
12.000	12.000	PASS
48.000	48.000	PASS

25' Tape Measure (Tolerance: ± 0.125")

Reference RULE ID: RF-RUL-001

25T ID: C-25T- 002

Reference Rule (")	As Found 25T (")	Tolerance (Pass/Fail)
3.000	3.000	PASS
24.000	24.000	PASS
48.000	48.000	PASS

100' Tape Measure (Tolerance: ± 0.125")

Reference RULE ID: RF-RUL-001

100T ID: C-100T- 002

Reference Rule (")	As Found 100T (")	Tolerance (Pass/Fail)
3.000	3.000	PASS
24.000	24.000	PASS
48.000	48.000	PASS

Digital Thermometer (Tolerance: 50-100° ± 2°F, 200-300° ±5°F, 400-1500° ±8°F)

Reference THR ID: RF-THC-009

THR ID: C-THR- 002

Reference Simulator (°F)	As Found THR (°F)	Tolerance (Pass/Fail)	Adjustment (Yes/No)	As Left THR (°F)
50	51	PASS	NO	SAME
100	100	PASS	NO	SAME
200	200	PASS	NO	SAME
300	301	PASS	NO	SAME
400	401	PASS	NO	SAME
600	601	PASS	NO	SAME
800	801	PASS	NO	SAME
1000	1001	PASS	NO	SAME
1500	1502	PASS	NO	SAME

Barometer (Tolerance: ± 2 mm Hg)

Reference DPG ID: RF-DPG-001

BAR ID: C-BAR- 002

Reference DPG Pressure (mm Hg)	As Found BAR Pressure (mm Hg)	Tolerance (Pass/Fail)	Adjustment (Yes/No)	As Left BAR Pressure (mm Hg)
732	732	PASS	NO	SAME

NOTES:

MAQS - DGM Calibration History

6/17/2021

Type (PRE/POST)	Calibration Date	Standard Meter Serial No.	Field Meter Box ACT No.	Delta H	Delta H@	Delta H	Delta H@	Delta H	Delta H@	Gamma	Average Delta H@	Performed By
PRE	:2/10/2021	1512377	T-MTB-016	1.00	1.822	2.00	1.969	3.00	1.895	0.9911	1.895	BW
PRE	2/11/2021	1512377	T-MTB-012	1.00	2.042	2.00	2.166	3.00	2.123	0.9913	2.110	BW
PRE	2/11/2021	1512377	T-MTB-011	1.00	1.820	2.00	1.924	3.00	1.885	1.0021	1.876	BW
PRE	2/11/2021	1512377	T-MTB-002	1.00	1.768	2.00	1.849	3.00	1.823	0.9924	1.814	BW
PRE	2/11/2021	1512377	T-MTB-006	1.00	1.958	2.00	2.031	3.00	2.006	0.9961	1.998	BW
PRE	2/12/2021	1512377	T-MTB-013	1.00	1.819	2.00	1.870	3.00	1.841	0.9945	1.844	BW
PRE	2/12/2021	1512377	T-MTB-004	1.00	1.893	2.00	1.906	3.00	1.856	1.0040	1.885	BW
PRE	2/12/2021	1512377	T-MTB-009	1.00	1.745	2.00	1.803	3.00	1.739	1.0155	1.762	BW
PRE	3/4/2021	1512377	T-MTB-008	1.00	1.615	2.00	1.694	3.00	1.651	0.9952	1.654	DM
PRE	3/4/2021	1512377	T-MTB-010	1.00	1.938	2.00	1.996	3.00	1.992	1.0073	1.975	DM
PRE	3/11/2021	1512377	T-MTB-015	1.00	1.911	2.00	2.067	3.00	2.010	1.0164	1.996	DM
PRE	4/5/2021	1512377	T-MTB-004	1.00	1.806	2.00	1.893	3.00	1.811	1.0059	1.837	DM
PRE	4/6/2021	1512377	T-MTB-012	1.00	2.002	2.00	2.052	3.00	2.049	1.0052	2.033	DM
POST	4/14/2021	1512377	T-MTB-015	1.50	2.024	1.50	2.010	1.50	2.020	1.0224	2.018	JG
POST	4/19/2021	1512377	T-MTB-008	1.24	1.538	1.24	1.528	1.24	1.536	1.0083	1.534	MM
PRE	5/3/2021	1512377	T-MTB-008	1.00	1.579	2.00	1.574	3.00	1.569	1.0066	1.574	CT
PRE	5/4/2021	1512377	T-MTB-006	1.00	1.884	2.00	1.934	3.00	1.929	0.9825	1.915	CT
PRE	5/4/2021	1512377	T-MTB-011	1.00	1.757	2.00	1.847	3.00	1.821	0.9969	1.808	CT
PRE	5/5/2021	1512377	T-MTB-013	1.00	1.746	2.00	1.763	3.00	1.773	1.0127	1.761	BW
PRE	5/25/2021	1512377	T-MTB-002	1.00	1.686	2.00	1.749	3.00	1.757	1.0126	1.736	MM
PRE	5/25/2021	1512377	T-MTB-015	1.00	1.890	2.00	1.995	3.00	1.976	1.0090	1.954	MM
PRE	5/25/2021	1512377	T-MTB-012	1.00	1.985	2.00	2.084	3.00	2.030	1.0159	2.033	MM
PRE	5/26/2021	1512377	T-MTB-010	1.00	1.911	2.00	1.899	3.00	1.879	1.0122	1.896	MM
PRE	5/26/2021	1512377	T-MTB-004	1.00	1.790	2.00	1.878	3.00	1.794	1.0054	1.820	MM

MAQS - Calibration Kit Audit History

6/17/2021

Audit Date	Calibration Kit ID	*Audited Equipment*											Performed By
		Calilper	Digital Protrator 1	Digital Protractor 2	Steel Protractor 1	Steel Protractor 2	12-In. Tape Measure 1	12-In. Tape Measure 2	25-Ft. Tape Measure	100-Ft. Tape Measure	DPG	THR	
2/9/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
2/9/2021	C-CKT-002	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
2/9/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
2/9/2021	C-CKT-005	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	CT
2/15/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
2/19/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
3/4/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	CT
3/10/2021	C-CKT-002	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
3/10/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
3/10/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
3/18/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
3/18/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
3/18/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
3/31/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
3/31/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
4/28/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
4/28/2021	C-CKT-002	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
4/28/2021	C-CKT-005	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	JG
4/28/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐	JG
4/30/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
5/12/2021	C-CKT-002	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
5/12/2021	C-CKT-003	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐	☑	MM
5/12/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
5/13/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
5/21/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
5/21/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
5/21/2021	C-CKT-002	☐	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	MM
6/7/2021	C-CKT-004	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
6/9/2021	C-CKT-001	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG
6/9/2021	C-CKT-002	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	JG

RICE LAKE Certificate of Weight Calibration

ISO/IEC 17025 & ANSI/NCSL-Z540-1-1994 ACCREDITED

TMAP

Traceable Certificate Number: 3176524
Contractor: MONTROSE AIR QUALITY SERVICES LLC
10060 BRECKSVILLE RD
BRECKSVILLE, OH 44141
Purchase Order Number: PO-004173
Client: MONTROSE AIR QUALITY SERVICES LLC
10060 BRECKSVILLE RD
BRECKSVILLE, OH 44141
Date Received: 11 Feb 2021
Date Calibrated: 15 Feb 2021
Recalibration Date: 15 Feb 2022
NIST Certificate Number: 684/291344-18 & 684/292805-19
If there are two NIST numbers, one or both may apply
Calibrated By: 27
Procedure: WI05-0095 Rev. D
Condition of Weights: Acceptable for Calibration
Description of Weights: 500 g Polished Weight, ASTM Class 1, S/N 6007, ID# C-W500-002
Comments:

Key Notes

Finish	Indicates the weight does not meet the finish requirements
Material	Indicates the weight does not meet the material requirements
New Wt	Indicates new weight
Missing Wt	Indicates replaced missing weight with new weight
Damaged Wt	Indicates replaced damaged weight
Replaced OOT	Indicates replaced out of tolerance weight
OOT	Indicates correction plus or minus Uncertainty greater than or equal to MPE
Magnetic Wt	Indicates replaced magnetic weight
Design	Indicates the weight does not meet the design or shape requirements
Repainted	Indicates the weight was repainted after As Found obtained
Other	See comments above

Cleaning Levels

A	Dusted with brush or cloth
B	Spot cleaned with ethyl alcohol
C	Full surface cleaned with ethyl alcohol
D	Spot cleaned with non-alcohol solvent followed by ethyl alcohol
E	Full surface cleaned with non-alcohol solvent followed by ethyl alcohol
F	No cleaning performed

Material Abbreviations

AL	Aluminum	TA	Tantalum
SS	Stainless Steel	BR	Brass
CI	Cast Iron	PL	Platinum
IR	Iron	NS	Nickel Silver
MS	Mild Steel	OR	Other/Unknown

Check with your local state agency for certification of compliance on Legal-for-Trade items. The weight accuracy class is referenced in the Description of Weights. Unless otherwise noted, the weights calibrated meet the requirements of the accuracy class. Results relate only to weights calibrated. The Surface Finishes of weights are evaluated visually. Weights are screened for magnetism using work instruction WI05-0035 when they are new, when requested by the customer or when weights are suspected of not meeting specifications. Density if measured is measured using OIML R111-1 (2004) method A2. Conventional Mass is reported based on a reference density of 8.0 g/cm^3. The Uncertainty of Measurement is included in the determination of Maximum Permissible Error (MPE) Pass/Fail Criteria. The specifications for Maximum Permissible Error (MPE) can be found in NIST Handbook 105-1 (2019), NIST Handbook 105-1 (1990), ASTM E617-18 or OIML R111-1 (2004), manufacturer specifications or customer specifications.

The Uncertainty assigned to the Conventional Mass values are the result of the root-sum-square of the type A and type B components, calculated in accordance with NIST SOP 29 and the Guide to the expression of uncertainty in measurement, with coverage factor (k=2), to express the expanded uncertainty with an approximate 95.45% confidence level. This report is not to be used to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any government agency. This document shall not be reproduced, except in full, without the written approval of Rice Lake Weighing Systems.

Dan Demers, Metrologist

15 Feb 2021
Date:

NVLAP® CALIBRATION
NVLAP LAB CODE 105001-0

ilac-MRA

Prepared By:
Rice Lake Weighing Systems®●PN 64784●06/20
230 West Coleman Street●Rice Lake, WI 54868●USA
TEL: 715-234-9171●FAX: 715-234-6967
Definitions: http://certs.ricelake.com/certs/DefinitionsV2.docx
Page 1 of 2

ilac-MRA A2LA ACCREDITED Certificate #4363.01

RICE LAKE

Certificate of Weight Calibration

ISO/IEC 17025 & ANSI/NCSL-Z540-1-1994 ACCREDITED

Traceable Certificate Number: 3176524
Client: MONTROSE AIR QUALITY SERVICES
Date Calibrated: 15 Feb 2021

Temperature Range: 21.49 °C
Pressure Range: 744.53 mmHg
Relative Humidity Range: 50 %

As Left Data (As Found only shown when different than As Left)

Nominal Value	Unique ID	True Mass	True Mass Corr. (mg)	Conv. Mass	Conv. Mass Corr. (mg)	(k=2) Unc. (± mg)	MPE (± mg)	MPE Pass	Assumed Density (g/cm^3)	Assumed Material	Const. Type	Balance Used	Reference Standard Set Used	Air Density (mg/cm^3)	Clean Level
500 g	**6007**	500.000572	0.572	**500.000101**	**0.101**	0.068	1.2	Y	7.95	SS	II	699Q	L595Q	1.1683	A

MONITORING INSTRUMENTS

7410 Worthington-Galena Rd
Worthington, Ohio 43085
Phone: (614) 436-4933

Industrial Environmental Monitoring Instruments, Inc.

Website: www.ierents.com

Certificate of Calibration
Pressure / Temperature Calibration

Instrument: Shortridge ADM 850
Serial #: M03736
Technician: Sam Shults

Date: 2/11/2021
Date Due: 2/11/2022

Montrose

Lab Standard	Meter Reading	% Difference
Differential Pressure / Negative Port		
0.03120	0.0310	0.65
0.5020	0.5010	0.20
1.520	1.515	0.33
10.07	10.05	0.20
20.12	20.05	0.35
55.01	54.80	0.38

NIST Traceable Standards

TSI 8715 DP-Calc sn.T87151616001 Cal Due: 6/15/2021
DPI-740 sn: 74001549 Cal Due: 1/14/2022

Lab Standard	Meter Reading	% Difference
Differential Pressure / Positive Port		
1.43	1.42	0.01
14.85	14.75	0.10
55.12	54.90	0.22

Accuracy: +/- 2%, +/- 0.001"H2O

Lab Standard	Meter Reading	% Difference
Absolute Pressure		
37.000	36.9	0.27
33.000	33.0	0.00
29.330	29.3	0.10
11.000	10.9	0.92
1.000	0.9	0.10

Accuracy: +/- 2% + 0.1 "Hg

APEX SOURCE TESTING EQUIPMENT INSTRUMENTS

Revised: 2019/12/27

Certificate of Calibration

Secondary Reference Meter 2-Pt Verification - Cubic Feet (ft^3)

UUT Meter Console Information

DGM Model #:	S-110
DGM Serial #:	1512377
Initial Gamma:	0.9979

Calibration Conditions

Barometric Pressure (in. Hg):	29.70
Ambient Temperature (°F):	71.2
Relative Humidity (%):	49
Altitude (ft):	414.0
Corrected Baro. Pressure (in. Hg):	29.29

Factors/Conversions

Std Temp (°R):	527.67
Std Press (in. Hg):	29.92
K_1 (°R/in. Hg):	17.636

Reference Equipment

WTM Model:	W-NKoDa-5B
WTM Cal. Due Date:	Feb. 2021
WTM Thermometer:	Internal
Serial #:	546258
Gamma:	0.9992

High Point

UUT Meter (DGM)

Run Time (minutes)	Orifice, ΔH (in. H_2O)	Volume (ft^3) Initial	Volume (ft^3) Final	Volume (ft^3) Total	Outlet Temperature (°F) Initial	Outlet Temperature (°F) Final
Θ	P_m	V_{mi}	V_{mf}	V_m	t_{mi}	t_{mf}
5.00	-0.95	642.4210	648.5520	6.1310	70.6	70.7

Reference Meter (WTM)

Meter Pressure (mm H_2O)	Volume (L) Initial	Volume (L) Final	Volume (L) Total	Outlet Temperature (°C) Initial	Outlet Temperature (°C) Final
P_w	V_{wi}	V_{wf}	V_w	t_{wi}	t_{wf}
-6.00	17.699	192.466	174.767	20.9	21.0

Standardized Data

Test Meter Std. Volume	Test Meter Std. Flow Rate	Reference Meter Std. Volume	Reference Meter Std. Flow Rate
Vm_{std} (ft^3)	Qm_{std} (ft^3/min)	Vw_{std} (ft^3)	Qw_{std} (ft^3/min)
5.9569	1.191	6.013	1.203

Results

Correction Factor Current	Correction Factor Previous	Flow Rate (Std & Corr.)
(Y)	(Y)	Qm_{std} (ft^3/min)
1.0095	1.0062	1.203

0.32% = Y Variation < 1.5%

Low Point

UUT Meter (DGM)

Run Time (minutes)	Orifice, ΔH (in. H_2O)	Volume (ft^3) Initial	Volume (ft^3) Final	Volume (ft^3) Total	Outlet Temperature (°F) Initial	Outlet Temperature (°F) Final
Θ	P_m	V_{mi}	V_{mf}	V_m	t_{mi}	t_{mf}
15.00	-0.17	648.5520	654.7920	6.2400	70.7	71.1

Reference Meter (WTM)

Meter Pressure (mm H_2O)	Volume (L) Initial	Volume (L) Final	Volume (L) Total	Outlet Temperature (°C) Initial	Outlet Temperature (°C) Final
P_w	V_{wi}	V_{wf}	V_w	t_{wi}	t_{wf}
-0.50	192.466	366.244	173.778	21.0	21.1

Standardized Data

Test Meter Std. Volume	Test Meter Std. Flow Rate	Reference Meter Std. Volume	Reference Meter Std. Flow Rate
Vm_{std} (ft^3)	Qm_{std} (ft^3/min)	Vw_{std} (ft^3)	Qw_{std} (ft^3/min)
6.0719	0.405	5.980	0.399

Results

Correction Factor Current	Correction Factor Previous	Flow Rate (Std & Corr.)
(Y)	(Y)	Qm_{std} (ft^3/min)
0.9849	0.9922	0.399

0.74% = Y Variation < 1.5%

Scaling Factor: N/A

Console Gamma: 1.0000

Original Cal Date: January 23, 2020

Verification Date: February 2, 2021

Technician: Jake Bush Signature: Jake Bush

The instrument(s) listed and described on this certificate have been calibrated against standards traceable to the National Institute of Standards and Technology (N.I.S.T.) and in accordance with EPA Method 5, Section 16.1.2.2.

Apex Instruments - Address: 204 Technology Park Ln., Fuquay-Varina, NC 27526 USA | Tel: (919) 557-7300 Web: www.apexinst.com

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Certificate of Calibration - Supplemental

Secondary Reference Meter 2-Pt Verification - Cubic Feet (ft3)

Nomenclature

ΔH@ - Orifice press. Diff. that equates to 0.75 CFM (0.0212 CMM) at STP
DGM - Dry Gas Meter
K_1 - Constant based on standard temperature and pressure
Θ - Run time, in minutes
$P_{m(g)}$ - ΔH (Meter Pressure, gauge)
$V_{m(std)}$ - Volume collected by test meter, corrected for STP
$Q_{m(std)}$ - Calculated flow rate of test meter
K' - Critical orifice coefficient
P_w - Measured pressure of reference meter
t_w - Temperature measured in reference meter
t_m - Temperature measured in test meter
Y - Ratio of volume collected from test meter and orifice
$Vw_{(std)}$ - Volume collected by reference meter, corrected for STP
$Qw_{(std)}$ - Calculated flow rate of reference meter/standard
corr - Volume or flow rate for a meter corrected by the scaling factor

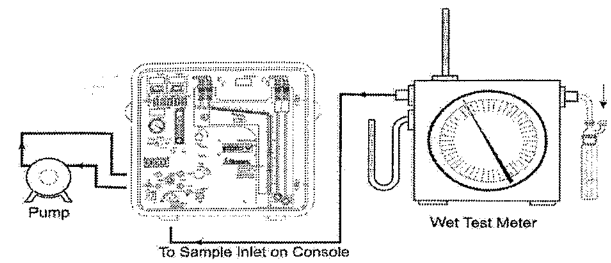
Equations

$$K_1 = \frac{T_{std}}{P_{std}} \qquad Y = \frac{V_{w(std)}}{V_{m(std)}}$$

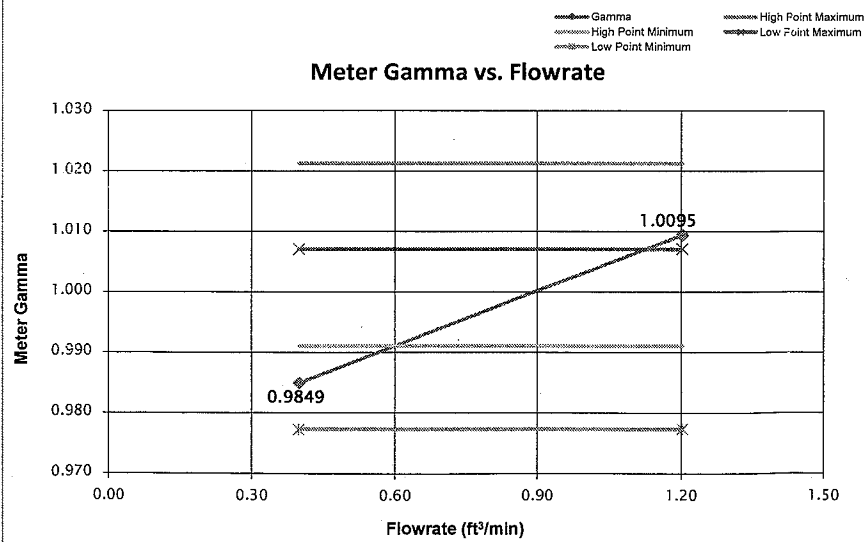
$$V_{m(std)} = K_1 * \frac{V_m * \left(P_{bar} + \frac{\Delta H}{13.6}\right)}{T_m} \qquad Q_{m(std)} = \frac{V_{m(std)}}{\Theta}$$

$$V_{w(std)} = Y * K_1 \frac{V_w * \left(P_{bar} + \frac{P_{m(g)}}{13.6}\right)}{T_w} \qquad Q_{w(std)} = \frac{V_{w(std)}}{\Theta}$$

Calibration Train



Calibration Graphs



APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Revised: 2019/12/27

Certificate of Calibration

Secondary Reference Meter Calibration - Cubic Feet (ft^3)

Reference Meter Information

DGM Model #: S-110
DGM Serial #: 1512377

Calibration Conditions

Barometric Pressure (in Hg): 30.31
Ambient Temperature (°F): 68.0
Relative Humidity (%): 52
Altitude (ft): 414.0
Corrected Baro. Pressure (in Hg): 29.90

Factors/Conversions

Standard Temperature (°R): 527.67
Standard Pressure (in. Hg): 30
K_1 Coefficient (°R/in. Hg): 17.636
Standard Temperature (°K): 293.15
Standard Pressure (mm Hg): 760
K_1 Coefficient (°K/mm Hg): 0.3858

Reference Equipment

WTM Model: W-NKDa-1A
WTM Cal. Due Date: 25-Feb-20
WTM Thermometer: Hg
WTM Serial: 546258
Gamma: 0.9999

	UUT Meter (DGM)							Reference Meter (WTM)							Results			
Run Time (minutes)	Meter Pressure (in H_2O)	Volume (ft^3)				Outlet Temperature (°F)		Meter Pressure (mm H_2O)	Volume (L)				Outlet Temperature (°C)		Calibration Factor		Flowrate Std. & Corr. (ft^3/min)	
		Initial	Final	Total	Standardized	Initial	Final		Initial	Final	Total	Standardized	Initial	Final	Final Gamma	Variation		
Θ	$P_{m(g)}$	V_{mi}	V_{mf}	V_m	$V_{m(std)}$	t_{mi}	t_{mf}	P_w	V_{wi}	V_{wf}	V_w	$V_{w(std)}$	t_{wi}	t_{wf}	Y_{final}	ΔY	$Q_{m(std\&corr)}$	
5.00	-0.92	758.0410	764.1720	6.1310	6.1122	68.0	68.0	-7.00	489.640	664.330	174.690	173.634	21.3	21.4	1.0032	-0.0030	1.222	Variation from Overall Avg. Y
5.00	-0.92	764.1720	770.3250	6.1530	6.1342	68.0	68.0	-7.00	664.330	840.160	175.830	174.738	21.4	21.4	1.0060	-0.0003	1.227	
5.00	-0.92	770.3250	776.4750	6.1500	6.1207	68.0	69.8	-7.00	840.160	1016.190	176.030	174.966	21.4	21.3	1.0095	0.0033	1.224	
															1.0062	Averages	1.224	0.008
6.00	-0.64	794.7940	800.7850	5.9910	5.9363	71.6	71.6	-5.00	1530.700	1700.550	169.850	168.570	21.8	21.9	1.0028	-0.0005	0.989	Variation from Overall Avg. Y
6.00	-0.64	800.7850	806.7900	6.0050	5.9401	71.6	73.4	-5.00	1700.550	1870.860	170.310	168.970	21.9	22.0	1.0045	0.0012	0.990	
6.00	-0.64	806.7900	812.8070	6.0170	5.9419	73.4	73.4	-5.00	1870.860	2040.930	170.070	168.703	22.0	22.0	1.0027	-0.0007	0.990	
															1.0033	Averages	0.990	0.005
7.00	-0.43	812.8070	818.3630	5.5560	5.4895	73.4	73.4	-3.00	2040.930	2197.460	156.530	155.275	22.0	22.1	0.9989	0.0026	0.784	Variation from Overall Avg. Y
7.00	-0.43	818.3630	823.9430	5.5800	5.5039	73.4	75.2	-3.00	2197.460	2354.250	156.790	155.454	22.1	22.3	0.9974	0.0012	0.786	
7.00	-0.43	823.9430	829.5550	5.6120	5.5262	75.2	75.2	-3.00	2354.250	2510.970	156.720	155.306	22.3	22.4	0.9925	-0.0038	0.789	
															0.9963	Averages	0.787	0.002
10.00	-0.25	829.5550	835.2070	5.6520	5.5587	75.2	77.0	-1.00	2510.970	2668.700	157.730	156.284	22.4	22.5	0.9929	0.0016	0.556	Variation from Overall Avg. Y
10.00	-0.25	835.2070	840.8610	5.6540	5.5513	77.0	77.0	-1.00	2668.700	2826.150	157.450	155.954	22.5	22.6	0.9921	0.0008	0.555	
10.00	-0.25	840.8610	846.5350	5.6740	5.5709	77.0	77.0	-1.00	2826.150	2983.700	157.550	156.000	22.6	22.7	0.9889	-0.0024	0.557	
															0.9913	Averages	0.556	0.007
15.00	-0.15	776.4750	782.5740	6.0990	6.0711	69.8	69.8	0.00	1016.190	1187.900	171.710	170.788	21.3	21.4	0.9934	0.0013	0.405	Variation from Overall Avg. Y
15.00	-0.15	782.5740	788.6730	6.0990	6.0608	69.8	71.6	0.00	1187.900	1359.330	171.430	170.423	21.4	21.6	0.9930	0.0008	0.404	
15.00	-0.15	788.6730	794.7940	6.1210	6.0724	71.6	71.6	0.00	1359.330	1530.700	171.370	170.248	21.6	21.8	0.9901	-0.0021	0.405	
															0.9922	Averages	0.405	0.006

Calibration Average Y	Variation
0.9979	Passed

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is ±0.02.

Technician: Eric Waters Signature: Date: January 20, 2020

The instruments listed and described on this certificate have been calibrated against standards traceable to the National Institute of Standards and Technology (N.I.S.T.) and in reference to EPA Method 5, Section 16.

Apex Instruments - Address: 204 Technology Park Ln., Fuquay-Varina, NC 27526 USA | Tel: (919) 557-7300 Web: www.apexinst.com

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ilac-MRA A2LA ACCREDITED A2LA Certificate No. 1750.01 Calibration

Cert. No.: 4800-11261979

Traceable® Certificate of Calibration for Digital Humidity/Temp. Meter

Customer :MAQS - Cleveland ,10060 Brecksville Road ,Brecksville ,OH-44141 ,U.S.A.

Instrument Identification:

Model: 89500-398, S/N: 150032554 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Thermometer	221197993	10 Oct 2020	4000-10785768
Chilled Mirror Hygrometer	31874/1H2048MR	22 Jan 2021	18004

Certificate Information:

Technician: 126 Procedure: CAL-17 Cal Date: 01 May 2020 Cal Due Date: 01 May 2021

Test Conditions: 45%RH 23.93°C 1016mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	40.19	36.3	N	40.19	36.3	N	37.2	43.2	0.46	>4:1
°C	23.71	23.0	Y	23.71	23.0	Y	22.7	24.7	0.076	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Marisa Elms

Marisa Elms, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Digital Humidity/Temp. Meter should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Humidity/Temp. Meter change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 01 May 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

OCS TECHNOLOGIES
14901 Emery Avenue | Cleveland, OH 44135
800.362.0364 | ocscal.com | info@ocscal.com

Certificate of Calibration

CUSTOMER:
MONTROSE AIR QUALITY SERVICES, LLC
10060 BRECKSVILLE ROAD
BRECKSVILLE, OH 44141

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY

ASSET NUMBER:	**RF-DPG-001**	**PERFORMED ON:**	**14 Apr 2021**
OWNER ASSET #:	RF-DPG-001	**DATE DUE:**	**14 Apr 2022**
UNIT UNDER TEST:	OMEGA DPG1000B-760AMMHG DIGITAL PRESSURE GAGE	TEST RESULT:	PASS
		DATA TYPE:	FOUND-LEFT
		TEMP / HUMIDITY:	72.0 °F / 45 %RH
SERIAL NUMBER:	7113804001	SERVICE SITE:	OCS
LOCATION:		CALIBRATED BY:	ANDREW VUCETIC
PROCEDURE NAME:	ASME B40.100, mmHg, 1 STD	APPROVED BY:	Joseph S. [signature]

Unless Otherwise Noted: OCS Technologies, Inc. certifies that the above listed instrument has been tested using standards that are traceable to the International System of Units (SI) through the National Institute of Standards & Technology (NIST) or through another National Metrology Institute (NMI). The item tested meets or exceeds all specifications as stated in the referenced procedure solely at the time of calibration. Measurement uncertainty if reported has been calculated at k=2 providing a 95% confidence interval and has been excluded from the Pass/Fail Result above. OCS is ISO/IEC 17025accredited by ANAB (Cert#L1152-1). Calibration performed in accordance with ISO/IEC 17025:2017 and ISO 10012:2003. This report may only be reproduced in full. Temperature and Humidity for on-site work may be reported above as the mean of high and low values recorded for all items on the day of service. If the data type is FOUND-LEFT then the As Found and As Left data are the same.

Remarks: ALL VALUES ARE mmHg Absolute.

Standards Used

Asset	Traceable Through	Description	Cal Date	Cal Due Date
DPI104-1	2055844	DRUCK DPI-104 DIGITAL PRESSURE GAGE, 100 PSIA	13 Jun 2019	13 Jun 2021

Test Results

TESTED IN ACCORDANCE WITH ASME B40.100-2013 Sec 6.2.4.1 & OCSWI#22 with Increasing Points Only unless Decreasing Points are listed.

Tolerances are based upon Table 1 or Customer Specifications. If Grade is unknown, OCS tolerance will be +/-1 gradation from 25-75% of range and +/-2 graduations from 0-25% of range and 75-100% of range.

Test Description	Range	True Value	Test Result	Lower Limit	Upper Limit		%TOL	Status
741 mmHg		741	741	738	744	m mHg	3.33	Pass
600 mmHg		599	600	596	602	m mHg	26.7	Pass
500 mmHg		500	500	497	503	m mHg	6.67	Pass
350 mmHg		351	350	348	354	m mHg	30	Pass
200 mmHg		200	200	197	203	m mHg	6.67	Pass
100 mmHg		101	100	98	104	m mHg	16.7	Pass

Certificate # 2805C9979379B94A8E61B740C70A44CD

Issue Date:: 16 Apr 2021 Form No.: 133 Rev 10/2019 Page 1 of 1

MONITORING INSTRUMENTS

7410 Worthington-Galena Rd
Worthington, Ohio 43085
Phone: (614) 436-4933

Industrial Environmental Monitoring Instruments, Inc.

Website: www.ierents.com

Thermocouple Meter Certificate of Calibration

Instrument: Omega CL23A
Serial#: T-301230 / RF-THC-009

Date: 3/1/2021
Technician: Sam Shults

Montrose

Meter Mode Data Fahrenhiet

Type K		Type J		Type T	
Standard	Actual reading	Standard	Actual reading	Standard	Actual reading
32.0	31.9	32.0	31.7	32.0	32.0
500.0	499.8	250.0	249.6	250.0	249.8
1000.0	999.7	500.0	499.6	700.0	699.8
2000.0	1999.5	1400.0	1399.4		

Calibrator Mode Data Fahrenhiet

Type K		Type J		Type T	
Standard	Actual reading	Standard	Actual reading	Standard	Actual reading
32.0	32.2	32.0	32.5	32.0	32.1
500.0	500.3	250.0	250.6	250.0	250.1
1000.0	1000.4	500.0	500.5	700.0	750.1
2000.0	2000.6	1400.0	1400.7		

Allowable Tolerance +\- 1.0 F

Reference Standards

PIE 525B sn. 116765 Cal Due: 9/28/2021

Instrument must be calibrated and operated according to manufacturers specifications
The calibration standards used are NIST traceable

OCS TECHNOLOGIES
14901 Emery Avenue | Cleveland, OH 44135
800.362.0364 | ocscal.com | info@ocscal.com

Certificate of Calibration

CUSTOMER:
MONTROSE AIR QUALITY SERVICES, LLC
10060 BRECKSVILLE ROAD
BRECKSVILLE, OH 44141

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY

ASSET NUMBER:	**RF-RUL-001**	**PERFORMED ON:**	**14 Apr 2021**
OWNER ASSET #:	RF-RUL-001	**DATE DUE:**	**14 Apr 2022**
UNIT UNDER TEST:	PRODUCTS ENGINEERING 4 SCALE 48" STEEL RULE	TEST RESULT:	PASS
		DATA TYPE:	FOUND-LEFT
		TEMP / HUMIDITY:	68.6 °F / 46 %RH
SERIAL NUMBER:	181310261	SERVICE SITE:	OCS
LOCATION:		CALIBRATED BY:	ANDREW VUCETIC
PROCEDURE NAME:	OCSCP#32	APPROVED BY:	Joseph S [signature]

Unless Otherwise Noted: OCS Technologies, Inc. certifies that the above listed instrument has been tested using standards that are traceable to the International System of Units (SI) through the National Institute of Standards & Technology (NIST) or through another National Metrology Institute (NMI). The item tested meets or exceeds all specifications as stated in the referenced procedure solely at the time of calibration. Measurement uncertainty if reported has been calculated at k=2 providing a 95% confidence interval and has been excluded from the Pass/Fail Result above. OCS is ISO/IEC 17025accredited by ANAB (Cert#L1152-1). Calibration performed in accordance with ISO/IEC 17025:2017 and ISO 10012:2003. This report may only be reproduced in full. Temperature and Humidity for on-site work may be reported above as the mean of high and low values recorded for all items on the day of service. If the data type is FOUND-LEFT then the As Found and As Left data are the same.

Remarks: .

Standards Used

Asset	Traceable Through	Description	Cal Date	Cal Due Date
CUSTOM3	CUSTOM3 12/31/2019	STARRETT 0.1" THROUGH 12" CUSTOM GAGE BLOCK SET	31 Dec 2019	30 Jun 2021

Test Results

Test Description	Range	True Value	Test Result	Lower Limit	Upper Limit	%TOL	Status
TESTED IN ACCORDANCE WITH OCSCP#32							

Ruler was verified throughout the 48" range.
on 1/10", 1/100", 1/32" AND 1/64" scale(s).

Measurement Uncertainty is +/-(0.02in +0.6R),
where R=the resolution of the ruler

Certificate # 8C0AA97E8F1649488F376E1094A2ADEE
Issue Date:: 16 Apr 2021

OCS TECHNOLOGIES
14901 Emery Avenue | Cleveland, OH 44135
800.362.0364 | ocscal.com | info@ocscal.com

Certificate of Calibration

CUSTOMER:
MONTROSE AIR QUALITY SERVICES, LLC
10060 BRECKSVILLE ROAD
BRECKSVILLE, OH 44141

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY

ASSET NUMBER:	**RF-DPR-001**	**PERFORMED ON:**	**14 Apr 2021**
OWNER ASSET #:	RF-DPR-001	**DATE DUE:**	**14 Apr 2022**
UNIT UNDER TEST:	MITUTOYO PRO 360 DIGITAL PROTRACTOR	TEST RESULT:	PASS
		DATA TYPE:	FOUND-LEFT
		TEMP / HUMIDITY:	68.6 °F / 46 %RH
SERIAL NUMBER:	12111032	SERVICE SITE:	OCS
LOCATION:		CALIBRATED BY:	ANDREW VUCETIC
PROCEDURE NAME:	OCSCP#33	APPROVED BY:	Joseph S. [signature]

Unless Otherwise Noted: OCS Technologies, Inc. certifies that the above listed instrument has been tested using standards that are traceable to the International System of Units (SI) through the National Institute of Standards & Technology (NIST) or through another National Metrology Institute (NMI). The item tested meets or exceeds all specifications as stated in the referenced procedure solely at the time of calibration. Measurement uncertainty if reported has been calculated at k=2 providing a 95% confidence interval and has been excluded from the Pass/Fail Result above. OCS is ISO/IEC 17025accredited by ANAB (Cert#L1152-1). Calibration performed in accordance with ISO/IEC 17025:2017 and ISO 10012:2003. This report may only be reproduced in full. Temperature and Humidity for on-site work may be reported above as the mean of high and low values recorded for all items on the day of service. If the data type is FOUND-LEFT then the As Found and As Left data are the same

Remarks: . VERIFIED PROTRACTOR AT 5, 10, 15, 20, 25 AND 30 DEGREES. PROTRACTOR READ 5.0, 10.0, 15.0, 20.0, 24.9 AND 29.9 DEGREES. ALL READINGS WITHIN TOLERANCE.

Standards Used

Asset	Traceable Through	Description	Cal Date	Cal Due Date
B30038	D-22-06-122018	MISC GRADE B SURFACE PLATE, 36" x 72"	19 Dec 2018	19 Dec 2021
ANGLE-2	ANGLE-2 8/27/2020	SPI 30-139-0 ANGLE BLOCK SET	27 Aug 2020	27 Aug 2022

Certificate # b59498c9637c184b83615ffc7db806ea

Issue Date:: 16 Apr 2021 Form No.: 133 Rev 10/2019 Page 1 of 1

OCS TECHNOLOGIES

14901 Emery Avenue | Cleveland, OH 44135
800.362.0364 | ocscal.com | info@ocscal.com

Certificate of Calibration

CUSTOMER:

MONTROSE AIR QUALITY SERVICES, LLC
10060 BRECKSVILLE ROAD
BRECKSVILLE, OH 44141

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY

ASSET NUMBER:	**RF-CLP-001**	**PERFORMED ON:**	**14 Apr 2020**
OWNER ASSET #:	RF-CLP-001	**DATE DUE:**	**14 Apr 2021**
UNIT UNDER TEST:	MITUTOYO 505-674 0-4" X .001" DIAL CALIPER	TEST RESULT:	PASS
		DATA TYPE	FOUND-LEFT
		TEMP / HUMIDITY:	68.6 °F / 48 %RH
SERIAL NUMBER:	12918175	SERVICE SITE:	OCS
LOCATION:		CALIBRATED BY:	ANDREW VUCETIC
PROCEDURE NAME:	CALIPER OCSCP#8,7OD,1ID,1D	APPROVED BY:	

Unless Otherwise Noted: OCS Technologies, Inc. certifies that the above listed instrument has been tested using standards that are traceable to the International System of Units (SI) through the National Institute of Standards & Technology (NIST) or through another National Metrology Institute (NMI). The item tested meets or exceeds all specifications as stated in the referenced procedure solely at the time of calibration. Measurement uncertainty if reported has been calculated at k=2 providing a 95% confidence interval and has been excluded from the Pass/Fail Result above. OCS is ISO/IEC 17025 accredited by ANAB (Cert#L1152-1). Calibration performed in accordance with ISO/IEC 17025:2017 and ISO 10012:2003. This report may only be reproduced in full. Temperature and Humidity for on-site work may be reported above as the mean of high and low values recorded for all items on the day of service. If the data type is FOUND-LEFT then the As Found and As Left data are the same.

Remarks: .

Standards Used

Asset	Traceable Through	Description	Cal Date	Cal Due Date
OCS-GB1	OCS-GB1 8/30/2019	STARRETT GRADE 0 GAGE BLOCK SET	30 Aug 2019	28 Feb 2021

Test Results

Test Description	Range	True Value	Test Result	Lower Limit	Upper Limit		%TOL	Status
Based Upon Applicable Portions of OCSCP#8 REV 8-11-2015								
OD READINGS:								
0.3500 in		0.3500	0.350	0.349	0.351	in	0	Pass
0.6500 in		0.6500	0.650	0.649	0.651	in	0	Pass
0.8000 in		0.8000	0.800	0.799	0.801	in	0	Pass
1.0000 in		1.0000	1.000	0.999	1.001	in	0	Pass
2.0000 in		2.0000	2.000	1.999	2.001	in	0	Pass
3.0000 in		3.0000	3.000	2.999	3.001	in	0	Pass
4.0000 in		4.0000	4.000	3.999	4.001	in	0	Pass
ID READINGS:								
1.0000 in		1.0000	1.000	0.999	1.001	in	0	Pass
DEPTH READING:								
1.0000 in		1.0000	1.000	0.999	1.001	in	0	Pass

Uncertainty of Measurement where L=Length in inches
(590+1L)uin from 0 to 4 in; (580+3L)uin from 4 to 80 in

Certificate # 5016F567F4166246A077CCDD1F050FB5
Issue Date:: 17 Apr 2020

Form No.: 133 Rev 10/2019

Certificate printed: 5/27/2021 at 13:22

Commercial Calibration

Starrett

Webber Micro Accurate Gages

24500 Detroit Rd., Cleveland, OH 44145

Certificate of Calibration 21-55185-A

SIZE CALIBRATION ONLY, DEVIATION EXPRESSED IN MICROINCHES

Uncertainty Coverage Factor = 2

NVLAP Calibration Lab Code 200038-0

Calibration Date: 5/27/2021

Property of: Montrose AQS
10060 Brecksville Rd
Brecksville, OH

Make: WEBBER 2 MISC
Style: SQUARE, STEEL
Grade: B89 0

Mfg. S/N: NONE
Own. S/N: NONE
Etch: PNA011

Marked Size	Tol Ind	Ref. Pt (μin.)	Etch-ID	Material	Style	Deviation at Auxiliary Points 1	2	3	4	Variation	Uncertainty	Calculated
.500		0				+2	+2	+1	-1	3	3.0	.500000
1.000		0				0	+1	+1	+1	1	3.0	1.000000

Original Calibration: 5/27/2021 Operator:CF
Transfer Master Set: C-5 Calibrated: 7/27/2019, Next Due: 5/31/2021.

Instrument: EC-4 Electronic Gage Block Comparator. Calibrated daily.

Calibration data is "As Found" unless otherwise noted. Calibration is in accordance with ISO 17025, ISO Guide 25, ISO 10012-1, ANSI/NCSL Z540-1, former MIL-STD-45662A, Webber Quality Manual QCM-1H dated 8/5/20 Webber calibration procedure WCP-C13 9/6/2006.
Webber Gage certifies these gage blocks were checked by masters traceable to the National Institute of Standards and Technology. Originals on 5/19/2019 Test No. 685-O-0000000053-19.

Tolerances in accordance with B89 grade 0.

Size	**Size Tol**	**Var**	**Size**	**Size Tol**	**Var**	**Size**	**Size Tol**	**Var**	**Size**	**Size Tol**	**Var**
Thru .05001	+6/-6	4	Thru 3.000	+10/-10	4	Thru 10.000	+24/-24	6	Half Round	+32/-32	12
Thru .400	+5/-5	4	Thru 4.000	+12/-12	5	Thru 12.000	+28/-28	7	Base Block	+24/-24	12
Thru 1.000	+6/-6	4	Thru 6.000	+16/-16	5	Thru 16.000	+36/-36	8	Strght Jaw	+24/-24	12
Thru 2.000	+8/-8	4	Thru 8.000	+20/-20	5	Thru 20.000	+44/-44	10	Meas Jaw	+24/-24	12

Uncertainty for Variation in Length (Variation) is: 2.0 μin. through 6 inches and 3.0 μin. through 20 inches.

Reported readings corrected to 68 degrees Fahrenheit (20 degrees C).
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. The results in this calibration certificate relate only to the items calibrated.

Authorized Signatures
Carl Stearns, Quality Assurance Manager, or
Brian L. Morris, Deputy Quality Assurance Manager

Starrett® Webber MicroAccurate Gages

24500 Detroit Rd., Cleveland, OH 44145

Commercial Calibration

Certificate of Calibration 21-55185-B

SIZE CALIBRATION ONLY, DEVIATION EXPRESSED IN MICROINCHES

Uncertainty Coverage Factor = 2

NVLAP® Calibration Lab Code 200038-0

Calibration Date: 5/27/2021

Property of: Montrose AQS
10060 Brecksville Rd
Brecksville, OH

Make: WEBBER 2 MISC
Style: SQUARE ACC., STEEL
Grade:

Mfg. S/N: NONE
Own. S/N: NONE
Etch:

Marked Size	Tol Ind	Ref. Pt (µin.)	Etch-ID	Material	Style	Deviation at Auxiliary Points 1	2	3	4	Variation	Uncertainty	Calculated
.500SJ		-1	PNA012			-1	+2			3	4.0	.499999
.500SJ		-2	PNA013			-2	+1			3	4.0	.499998

Original Calibration: 5/27/2021 Operator:CF
Transfer Master Set: C-5 Calibrated: 7/27/2019, Next Due: 5/31/2021.

Instrument: EC-4 Electronic Gage Block Comparator. Calibrated daily.

Calibration data is "As Found" unless otherwise noted. Calibration is in accordance with ISO 17025, ISO Guide 25, ISO 10012-1, ANSI/NCSL Z540-1, former MIL-STD-45662A, Webber Quality Manual QCM-1H dated 8/5/20 Webber calibration procedure WCP-C13 9/6/2006.
Webber Gage certifies these gage blocks were checked by masters traceable to the National Institute of Standards and Technology. Originals on 5/19/2019 Test No. 685-O-0000000053-19.

Tolerances in accordance with B89 grade AS1.

Size	Size Tol	Var	Size	Size Tol	Var	Size	Size Tol	Var	Size	Size Tol	Var
Thru .05001	+12/-12	6	Thru 3.000	+20/-20	6	Thru 10.000	+48/-48	10	Half Round	+32/-32	12
Thru .400	+8/-8	6	Thru 4.000	+24/-24	8	Thru 12.000	+56/-56	10	Base Block	+24/-24	12
Thru 1.000	+12/-12	6	Thru 6.000	+32/-32	8	Thru 16.000	+72/-72	12	Strght Jaw	+24/-24	12
Thru 2.000	+16/-16	6	Thru 8.000	+40/-40	10	Thru 20.000	+88/-88	14	Meas Jaw	+24/-24	12

Uncertainty for Variation in Length (Variation) is: 3.0 µin. through 12 inches and 4.0 µin. through 20 inches.

Reported readings corrected to 68 degrees Fahrenheit (20 degrees C).
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. The results in this calibration certificate relate only to the items calibrated.

Carl Stearns

Authorized Signatures
Carl Stearns, Quality Assurance Manager, or
Brian L. Morris, Deputy Quality Assurance Manager

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Appendix C.3
Instrumental Test Method QA/QC Data

Effective Date: 01/31/2020
Rev No. 5
Issued by: District Manager

Method 25A.xls 25A Field Data
Total Gaseous Organics

Company Name: OMNOVA
Location: T-Ox Inlet
Analyzer ID: T-FID- 021
Primary / Back-Up: P

Response Time (sec)	
Run 1-	55
Run 2-	55
Run 3-	55
Average Response Time (sec) -	55

	Actual/Target Value (ppmv as propane)	Pressure (psig)	Expiration Date (mm/dd/yy)	Cylinder Number
Zero-Level Calibration Gas	0	1950	3-10-29	SX64033
Low-Level Calibration Gas	3.0 /9	–	–	–
Mid-Level Calibration Gas	4.93/15	–	–	–
High-Level Calibration Gas	8.5/26	–	–	–
Calibration Gas Cylinder 1 (Diluter Use ONLY)	4.93	1300	3-11-27	SX058055
Calibration Gas Cylinder 2 (Diluter Use ONLY)	65.0	50		

	Run Number	1a	1b	2	3	
	Run Date	6-8-21	6-8-21	6-8-21	6-8-21	
	Analyzer Span (ppmv)	10%	30%	30%	30%	
Zero Gas	DAQ Time **Reading** (hh:mm)	0900	0953			
	Initial System Response (ppmv)	0.00	0.00			
High-Level Gas	DAQ Time **Reading** (hh:mm)	0906	0954			
	Initial System Response (ppmv)	8.50	26.01			
Low-Level Gas	DAQ Time **Reading** (hh:mm)	0908	0956			
	Initial System Response (ppmv)	3.10	9.28			
Mid-Level Gas	DAQ Time **Reading** (hh:mm)	0909	0957			
	Initial System Response (ppmv)	5.00	15.16			
	System Pressure (in. Hg)	0	0	0	0	
	Initial Ambient Temp. (°F)	75	75	75	75	
Zero Gas	DAQ Time **Reading** (hh:mm)	0949	1048	1215	1332	
	Final System Response (ppmv)	0.01	0.01	0.01	0.02	
Upscale Gas	DAQ Time **Reading** (hh:mm)	0952	1051	1219	1336	
	Final System Response (ppmv)	3.11	15.29	15.25	15.40	
	Final Ambient Temp. (°F)	75	75	75	75	
	System Pressure (in. Hg)	0	0	0	0	

Bag Sample (Methane/Ethane)	Tedlar Bag ID:					
	Start Time (hh:mm)					
	End Time (hh:mm)					
	Sample Collected (L):					

MAQS
D:\Testing\Project Management\RS Methods for Printing\Method 25A.xls
(Method 25A.xls-25A Field Data) 6/7/2021
1 of 1

Job Number: PR03-008887
Done By / Date: RS / 6-8-21
Final Check By / Date: RS / 6-8-21

Method 25A.xls 25A Field Data
Total Gaseous Organics

Effective Date: 01/31/2020
Rev No. 5
Issued by: District Manager

Company Name: OMNOVA
Location: T-OX Exhaust
Analyzer ID: T-FID- 024
Primary / Back-Up: P

Response Time (sec)	
Run 1-	45
Run 2-	48
Run 3-	45
Average Response Time (sec) -	45

	Actual/Target Value (ppmv as propane)	Pressure (psig)	Expiration Date (mm/dd/yy)	Cylinder Number
Zero-Level Calibration Gas	0	~~*0808~~ 1950	3-10-25	Sx640 33
Low-Level Calibration Gas	27.0	-	-	-
Mid-Level Calibration Gas	*~~45.0~~ 44.93	- 1200	3-17-28	Sx55368
High-Level Calibration Gas	75.0	-	-	-
Calibration Gas Cylinder 1 (Diluter Use ONLY)	75.0	1950	6-19-28	Sx57566
Calibration Gas Cylinder 2 (Diluter Use ONLY)				

	Run Number	1	2	3		
	Run Date	6-8-21	6-8-21	6-8-21		
	Analyzer Span (ppmv)	90	90	90		
Zero Gas	DAQ Time **Reading** (hh:mm)	0808				
	Initial System Response (ppmv)	0.0				
High-Level Gas	DAQ Time **Reading** (hh:mm)	0815				
	Initial System Response (ppmv)	75.0				
Low-Level Gas	DAQ Time **Reading** (hh:mm)	0817				
	Initial System Response (ppmv)	*~~27.0~~ 26.7				
Mid-Level Gas	DAQ Time **Reading** (hh:mm)	0820				
	Initial System Response (ppmv)	45.0				
	System Pressure (in. Hg)	0	0	0		
	Initial Ambient Temp. (°F)	75	75	75		
Zero Gas	DAQ Time **Reading** (hh:mm)	1103	1212	1339		
	Final System Response (ppmv)	0.6	*~~0.5~~ 0.3	0.1		
Upscale Gas	DAQ Time **Reading** (hh:mm)	1100	1218	1336		
	Final System Response (ppmv)	45.0	43.8	44.3		
	Final Ambient Temp. (°F)	75	75	75		
	System Pressure (in. Hg)	0	0	0		

Bag Sample (Methane/Ethane)	Tedlar Bag ID:					
	Start Time (hh:mm)					
	End Time (hh:mm)					
	Sample Collected (L):					

Slower rate for run 3, per facility.

MAQS
D:\Testing\Project Management\RS Methods for Printing\Method 25A.xls
(Method 25A.xls-25A Field Data) 6/7/2021
1 of 1

Job Number: PROJ-008887
Done By / Date: * RS / ~~8~~-6-21
Final Check By / Date: VLS / 6-8-21

Project Information

Date 6-8-21 Project # PROJ-008887

Customer / Facility OMNOVA

Unit ID / Sample Location T-OX

Operator RS

Notes: — — — — —

Equipment Information

Calibration gas diluter ID/SN 2140 Calibration expiration date 7-10-21

Audited dilution device (DD) ☑ DD1 ☑ DD2 ~~☐ DD 3~~ ~~☐ DD 4~~ ~~☐ DD 5~~ ~~☐ DD 6~~ ~~☐ DD 7~~ ~~☐ DD 8~~

DDs used to generate cal gases ☑ DD1 ☑ DD2 ~~☐ DD 3~~ ~~☐ DD 4~~ ~~☐ DD 5~~ ~~☐ DD 6~~ ~~☐ DD 7~~ ~~☐ DD 8~~

Total flow rate, LPM 5 Analyzer ID/SN T-FID-024 Analyte THC Span value 90

Calibration Gas Information

	Tag Value	Units (ppm or %)	Cylinder ID	Pressure (PSI)	Expiration Date
Dilution Level 1 Cylinder	75.0	PPMV	SX57566	1950	6-19-28
Dilution Level 2 Cylinder	75.0	PPMV	SX57566	1950	6-19-28
Direct Inject Cylinder*	44.93	PPMV	SX55368	1200 ~~3-17-28~~	3-17-28

Performance Data

	Predicted Diluted Value**	Units (ppm or %)	Time	Injection 1	Time	Injection 2	Time	Injection 3	Average
Dilution Level 1	30.0	PPMV	0828	29.5	0832	29.7	0841	29.6	
Dilution Level 2	45.0	PPMV	0822	45.0	0830	44.9	0843	45.1	
Direct Inject Gas	44.93	PPMV	0825	44.5	0836	44.8	0847	44.8	

Calculations

DI

	Injection 1	Injection 2	Injection 3
Dilution Level 1	0.34	0.34	0.00
Dilution Level 2	0.00	0.22	0.22
Direct Inject	0.45	0.22	0.22

DL

Dilution Level 1	Dilution Level 2	Direct Inject
1.33	0.00	0.51

DI - Difference of each injection from the average analyzer response

DI% = (I - R / I) * 100

DL - Difference from predicted for each dilution level

DL% = (P - R / P) * 100

I - Each individual injection

R - Average Response

P - Predicted diluted value

DI must be within 2% of the average instrument response for that dilution.

DL must be within 2% of predicted value.

* The Direct Inject Gas must be independent of the Dilution Level gases.

** One of the Dilution Levels must be within 10% of the Direct Inject gas tag value

All injection responses must be within 2% of the average instrument response for that dilution.

For each level of dilution the average concentration output from the analyzer must be within 2% of the predicted value.

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓

Checked by: RA Team Leader: RA

MONTROSE AIR QUALITY SERVICES

EPA Method 205 Field Datasheet

Page 1 of 1

Project Information

Date 6/8/2021 Project # PROJ-008887

Customer / Facility OMNOVA

Unit ID / Sample Location T-OX

Operator RS

Notes: -
-
-
-
-

Equipment Information

Calibration gas diluter ID/SN T-CGD-001 / SN 2140 Calibration expiration date 7/10/2021

Audited dilution device (DD) ☑ DD1 ☑ DD2 ☐ DD 3 ☐ DD 4 ☐ DD 5 ☐ DD 6 ☐ DD 7 ☐ DD 8

DDs used to generate cal gases ☑ DD1 ☑ DD2 ☐ DD 3 ☐ DD 4 ☐ DD 5 ☐ DD 6 ☐ DD 7 ☐ DD 8

Total flow rate, LPM 5 Analyzer ID/SN T-FID-024 / SN 1810034 Analyte THC Span value 90

Calibration Gas Information

	Tag Value	Units (ppm or %)	Cylinder ID	Pressure (PSI)	Expiration Date
Dilution Level 1 Cylinder	75.00	PPMV	SX57566	1950	6/19/2028
Dilution Level 2 Cylinder	75.00	PPMV	SX57566	1950	6/19/2028
Direct Inject Cylinder*	44.93	PPMV	SX55368	1200	3/17/2028

Performance Data

	Predicted Diluted Value**	Units (ppm or %)	Analyzer Response						
			Time	Injection 1	Time	Injection 2	Time	Injection 3	Average
Dilution Level 1	30.00	PPMV	08:28	29.50	08:32	29.70	08:41	29.60	29.60
Dilution Level 2	45.00	PPMV	08:22	45.00	08:30	44.90	08:43	45.10	45.00
Direct Inject Gas	44.93	PPMV	08:25	44.50	08:36	44.80	08:47	44.80	44.70

Calculations

DI

	Injection 1	Injection 2	Injection 3
Dilution Level 1	0.34%	0.34%	0.00%
Dilution Level 2	0.00%	0.22%	0.22%
Direct Inject	0.45%	0.22%	0.22%

DL

Dilution Level 1	Dilution Level 2	Direct Inject
1.33%	0.00%	0.51%

DI - Difference of each injection from the average analyzer response

DI% = (I - R / I) * 100

DL - Difference from predicted for each dilution level

DL% = (P - R / P) * 100

I - Each individual injection

R - Average Response

P - Predicted diluted value

DI must be within 2% of the average instrument response for that dilution.

DL must be within 2% of predicted value.

* The Direct Inject Gas must be independent of the Dilution Level gases.

** One of the Dilution Levels must be within 10% of the Direct Inject gas tag value

All injection responses must be within 2% of the average instrument response for that dilution.

For each level of dilution the average concentration output from the analyzer must be within 2% of the predicted value.

QA/QC Check: Completeness ☒ Legibility ☒ Accuracy ☒ Specifications ☒

Checked by: RS Team Leader: RS 001AS-QMS-WB-EPA205

US EPA METHOD 205 GAS DILUTION SYSTEM QA

Analyzer Serial Number: 1810034
Dilution System Serial Number: 2140
CGD Mass Flow Controllers Used: 1 and 2

	Dilution Level 1	Dilution Level 2	Direct Inject Gas
Calibration Tag Value (ppm):	75	75	44.93
Dilution Ratio:	2.50	1.67	-
Predicted Diluted Value (ppm):	30.00	45.00	-
Injection 1 Response (ppm):	29.50	45.00	44.50
Injection 2 Response (ppm):	29.70	45.00	44.80
Injection 3 Response (ppm):	29.60	44.90	44.80
Average Response (ppm):	29.60	44.97	44.70
Difference From Predicted (%):	1.33	0.07	0.51
Acceptable (YES/NO):	YES	YES	YES

US EPA REFERENCE METHOD 25A INSTRUMENT CALIBRATION AND QA

	P004 T-OX INLET DUCT					
FID ANALYZER	**Run 1**	**Acceptable**	**Run 2**	**Acceptable**	**Run 3**	**Acceptable**
Analyzer Span During Test Run (% as propane)	30.0	YES	30.0	YES	30.0	YES
Average Stack Gas Concentration (ppmv as propane)	62,250	YES	53,874	YES	37,537	YES
Zero Drift (% of Span)	0.03	YES	0.03	YES	0.07	YES
Calibration Drift for Mid-Level Gas (% of Span)	0.43	YES	0.30	YES	0.80	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-3.11	YES	-3.11	YES	-3.11	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-1.07	YES	-1.07	YES	-1.07	YES

	P004 T-OX EXHAUST STACK					
FID ANALYZER	**Run 1**	**Acceptable**	**Run 2**	**Acceptable**	**Run 3**	**Acceptable**
Analyzer Span During Test Run (ppmv as propane)	90.0	YES	90.0	YES	90.0	YES
Average Stack Gas Concentration (ppmv as propane)	1.89	YES	1.15	YES	0.83	YES
Zero Drift (% of Span)	0.67	YES	0.33	YES	0.11	YES
Calibration Drift for Mid-Level Gas (% of Span)	0.00	YES	-1.33	YES	-0.78	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	1.11	YES	1.11	YES	1.11	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-0.16	YES	-0.16	YES	-0.16	YES

MATHESON

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1700 Scepter Rd
Waverly, TN 37185
931-296-3357

Certificate of Analysis - EPA Protocol Mixtures

Customer:	MATHESON TRI-GAS 1650 ENTERPRISE PKWY TWINSBURG, OH 44087	Customer PO#: TOM BILLOCK		Part # G2682510
		Protocol:	Reference #:	Lot#:
Cylinder Number:	SX55368	G1	763927-4	9300606833
Cylinder Pressure:	1900 psig			
Last Analysis Date:	3/17/2020			
Expiration Date:	3/17/2028			

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

REPLICATE RESPONSES

Date: 3/17/2020

Component: Propane

Certified Conc: 44.93 ppm +/- 0.15 ppm ABS

44.91
44.97
44.93

BALANCE GAS: Air

REFERENCE STANDARDS:

Component:	Propane
Reference Standard:	SRM
Cylinder #:	FF55527
Concentration:	49.61ppm +/- 0.11ppm (abs)
Exp Date:	7/1/2024
SRM #:	1667b
NIST Sample#	83-K-22

CERTIFICATION INSTRUMENTS

Component:	Propane
Make/Model:	Horiba FIA-510
Serial Number:	2LNDTHVT
Measurement Principle:	FID
Last Calibration:	3/9/2020

Notes:

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D62020, PGVP Participation Date: 01/01/20, PGVP Renewal Date: 01/01/21
The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst: Cierra Freed

Cierra Freed

Date: 3/20/2020

Accredited by: ANAB

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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Certificate of Mixture Analysis

Customer Service Center
166 KEYSTONE DRIVE
MONTGOMERYVILLE, PA 18936
P 800-416-2505
F 215-619-0458
info@matheson-trigas.com

Manufacturing Location
200 ALESSIO DR
JOLIET, IL 60433

Shipping Location
200 ALESSIO DR
JOLIET, IL 60433

CYLINDER NUMBER(S)
*SX058055

To: MATHESON TRI-GAS
1650 ENTERPRISE PKWY
TWINSBURG, OH 44087

Certificate No: 605404
MTG Customer No: 124480
Sales Order No: 782189
Purchase Order No: PO-002581

Product: Multi-Component Mixture

Grade: CERTIFIED
MTG Part No: G2703829

Cylinder Size: 1R
Valve: CGA 350 BR

Contents:
Net: 95 ft³; 2.7 m³

Pressure: 1359 psig @ 70°F; 9472 kPa @ 21°C

	Requested Concentration	Certified Concentration	Units	Blend Tolerance	Certified Accuracy
Propane	5.00	4.93	%	±10%	±2%
Nitrogen	Balance	Balance			

TRACEABILITY

COMMENTS

*** Indicates the actual cylinder(s) analyzed.**

Lot No: 1021600397E
Fill Date: 03/09/2021
Expiration Date: 03/11/2024

Analysis Date: 03/11/2021

Unless otherwise indicated, Matheson Tri-Gas terms and conditions govern the product data contained herein. This document was issued electronically and data validated by electronic signature. For further information visit www.matheson-trigas.com.

Genaro Saenz - Analyst	Date: 03/11/2021	Shawn Bowen - QA Approval	Date: 03/29/2021

MATHESON
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1700 Scepter Rd
Waverly, TN 37185
931-296-3357

Certificate of Analysis - EPA Protocol Mixtures

Customer:	Matheson Tri-Gas 1650 Enterprise Pkwy Twinsburg, OH 44087	Customer PO#: CODY THAYER		Part # G2692395
		Protocol:	Reference #:	Lot#:
Cylinder Number:	SX57566	G1	768580-03	9300609436
Cylinder Pressure:	1900 psig			
Last Analysis Date:	6/19/2020			
Expiration Date:	6/19/2028			

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

REPLICATE RESPONSES
Date: 6/19/2020

Component: Propane

Certified Conc: 75.0 ppm +/- 0.5 ppm ABS

Replicate Responses (6/19/2020)
75.3
75.0
74.6

BALANCE GAS: AIR

REFERENCE STANDARDS:

Component:	Propane
Reference Standard:	SRM
Cylinder #:	FF55527
Concentration:	49.61 +/- 0.11 ppm ABS
Exp Date:	7/1/2024
SRM or Cert #:	1667b
Sample#	83-K-22

CERTIFICATION INSTRUMENTS

Component:	Propane
Make/Model:	Horiba FIA-510
Serial Number:	41679080101
Measurement Principle:	FID
Last Calibration:	6/12/2020

Notes:

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D62020, PGVP Participation Date: 01/01/20, PGVP Renewal Date: 01/01/21
The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst: Ashley Smallwood
Ashley Smallwood

Date: 6/22/2020

Accredited by:
ANAB

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY

MONTROSE
AIR QUALITY SERVICES

2140	CALIBRATED DEVICE
2140	CALIBRATED DEVICE SERIAL NUMBER
ENVIRONICS	MAKE
2020	MODEL
NITROGEN	CALIBRATION REFERENCE GAS
BW	TECHNICIAN
07/09/20	CALIBRATION DATE
07/10/21	CALIBRATION DUE DATE
28.74	LABORATORY BAROMETRIC PRESSURE (IN HG)
74	LABORATORY TEMPERATURE (DEG F)
10000	MASS FLOW CONTROLLER (MFC) 1 MAXIMUM VALUE (SCCM)
10000	MASS FLOW CONTROLLER (MFC) 2 MAXIMUM VALUE (SCCM)
1000	MASS FLOW CONTROLLER (MFC) 3 MAXIMUM VALUE (SCCM)
A-PFC-001	PRIMARY STANDARD ID
05/11/20	PRIMARY STANDARD CALIBRATION DATE
05/11/21	PRIMARY STANDARD NEXT CALIBRATION DUE DATE
CALIBRATION STANDARD: BIOS METLAB ML-500, SN-122543	
CALIBRATOR, 5-500SCCM RANGE: ML-800-10, SN-123433	
CALIBRATOR, 500-50000SCCM RANGE: ML-800-44, SN-123449	

AS FOUND (INITIALIZED POINTS)

MFC 1 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	500	498.9	544.5	8.90
10	1000	1002.8	1049.4	4.94
20	2000	2003.1	2054.4	2.72
30	3000	3006.0	3062.6	2.09
40	4000	4006.3	4085.4	2.14
50	5000	5009.1	5111.2	2.22
60	6000	6009.4	6133.8	2.23
70	7000	7012.3	7170.2	2.43
80	8000	8012.6	8197.0	2.46
90	9000	9015.4	9236.7	2.63
100	10000	10016.0	10271.0	2.71

AS FOUND (INITIALIZED POINTS)

MFC 2 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	500	494.0	507.4	1.48
10	1000	992.9	1008.0	0.80
20	2000	1990.8	2014.3	0.71
30	3000	2988.6	3038.1	1.27
40	4000	3989.0	4067.1	1.68
50	5000	4989.3	5099.4	1.99
60	6000	5987.2	6135.2	2.25
70	7000	6982.5	7172.8	2.47
80	8000	7980.4	8185.1	2.31
90	9000	8978.2	9153.3	1.70
100	10000	9978.6	9949.7	-0.50

AS FOUND (INITIALIZED POINTS)

MFC 3 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	50	49.6	34.7	-30.57
10	100	99.8	86.7	-13.33
20	200	200.1	189.8	-5.13
30	300	300.1	292.4	-2.54
40	400	400.2	394.1	-1.48
50	500	500.5	496.9	-0.62
60	600	600.8	598.8	-0.21
70	700	700.8	700.7	0.10
80	800	800.9	802.7	0.34
90	900	901.2	904.1	0.45
100	1000	1001.2	1001.3	0.13

*Standard Conditions: 0°C and 760mm Hg

Does the instrument require adjustment? ☑ YES ☐ NO

If YES then make adjustments and complete the AS LEFT section.

If NO then the AS LEFT values are the same as AS FOUND and no further calibration is necessary.

AS LEFT

MFC 1 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	500	500.8	499.7	-0.07
10	1000	1002.1	1000.6	0.06
20	2000	2005.1	1994.8	-0.26
30	3000	3005.9	2997.7	-0.08
40	4000	4005.9	3999.2	-0.02
50	5000	5008.2	4998.1	-0.04
60	6000	6008.6	6004.2	0.07
70	7000	7010.1	6997.0	-0.04
80	8000	8010.6	8009.9	0.12
90	9000	9012.1	9004.8	0.05
100	10000	10013.0	10005.0	0.05

AS LEFT

MFC 2 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	500	493.9	502.0	0.41
10	1000	995.9	1003.7	0.37
20	2000	1995.0	2003.5	0.18
30	3000	2990.9	3002.3	0.08
40	4000	3989.4	4000.3	0.01
50	5000	4985.9	4999.0	-0.02
60	6000	5988.3	5999.4	-0.01
70	7000	6984.8	6996.3	-0.05
80	8000	7984.5	8003.9	0.05
90	9000	8983.4	9005.1	0.06
100	10000	9974.3	10014.0	0.14

AS LEFT

MFC 3 CALIBRATION POINTS (% OF FULL SCALE)	TARGET FLOW (SCCM*)	FEEDBACK FLOW (SCCM*)	FLOW INDICATED BY PRIMARY STANDARD (SCCM*)	% ERROR (IF >1%, REPROGRAM DEVICE SETPOINTS)
5	50	49.8	50.0	-0.09
10	100	100.1	99.8	-0.19
20	200	200.3	199.5	-0.24
30	300	300.3	299.4	-0.20
40	400	400.6	399.5	-0.13
50	500	500.6	499.8	-0.04
60	600	600.8	599.9	-0.01
70	700	701.0	700.0	0.00
80	800	801.0	800.5	0.06
90	900	901.4	901.6	0.18
100	1000	1001.7	1003.4	0.34

*Standard Conditions: 0°C and 760mm Hg

Approved By: ______________________

MesaLabs

NVLAP®

NVLAP Lab Code 200661-0
Calibration

Met Lab® Calibration Certificate

Model. ML-500-44
Serial No. 123449
Calibration Date. May 12, 2020
Report No. 19520
Supersedes Report No. 18213
Sold To.
Air Compliance Testing, Inc.
PO Box 41156
Cleveland OH 44141
United States
PO No. 1050412

All calibrations are performed in accordance with ISO 17025 at Mesa Laboratories, Inc., 10 Park Place, Butler, NJ, 07405, 800-663-4977, an ISO 17025:2005 – accredited laboratory through NVLAP. This report shall not be reproduced except in full without the written approval of the laboratory. Results only relate to the items calibrated. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

The Met Lab ML-500 is a true primary volumetric flow standard. Temperature and pressure corrections are applied to the volumetric flow readings to obtain standardized flow readings. The ML-500-10 is rated with a standardized accuracy of ±0.40%, the ML-500-24 is rated at ±0.35%, and the ML-500-44 is rated at ±0.45%. All with a coverage factor of k=2 for a confidence interval of approximately 95%. The flow cells described above are dimensionally calibrated against NIST-traceable standards. The temperature and pressure sensors are also calibrated against NIST-traceable standards. Calibration certificates for the standards used in this calibration are available upon request. The diameter, length, temperature, and pressure are tested in accordance with procedure numbers PR12-01, PR12-02, PR12-04 and PR12-05.

A flow verification test is performed on all ML-500 flow cells per procedure number PR12-17 using high purity nitrogen or filtered laboratory air to ensure proper operation in typical laboratory conditions.

Expanded uncertainty:

Temperature	±0.04 °C
Absolute Pressure	±24 Pa
Length (note 1)	±0.014%
Diameter (note 1)	±0.007%

All at two times coverage factor of k=2 for a confidence interval of approximately 95%.

Note 1 – Length and Diameter uncertainty are accredited measurements only as part of Mesa Laboratories' flow measurement accreditation.

Laboratory Environment:

Temperature Ambient:	22.50 °C	Pressure Ambient:	751.70 mmHg

By:

Mohammed Aziz
Dir. Of Engineering
Mesa Laboratories, Inc., Butler, NJ

Calibration Certificate

Report Number 19520

Measurements for: ML-500-44 **SERIAL #: 123449**

Date May 12, 2020

As Received Flow Verification (Functionality Test)						
Nominal Flow sccm [1]	Ref. Std. SN 103521	Instrument Under Test	Deviation %	Allowable Deviation [2]	E_N [3]	Tolerance
50000	49975	49842	-0.27%	0.48%	0.55	In Tolerance
5000	5006	5002.3	-0.07%	0.48%	0.15	In Tolerance
500	503.01	502.73	-0.06%	0.48%	0.12	In Tolerance
Flow Standard Serial Number	Std Model	Std Cal Date	Std Cal Due Date			
103521	ML-800-44	12-Jun-2019	11-Jun-2020			

1. The flow rate at a standard temperature of 0ºC and pressure of 760 mmHg

2. Allowable Deviation for the Flow Verification refers to the RSS of total estimated uncertainty for the Instrument Under Test, the Reference Standard and the test uncertainty.

3. En values ≤ 1 indicate that the two flow measurements agree with each other within uncertainty expectations

As Received Temperature and Pressure Verification						
	Reference Standard	Instrument Under Test	Deviation	Allowable Deviation	E_N [3]	Tolerance
Bath Set Temp. 22.5 (ºC)	22.52	22.50	-0.02	0.5	0.04	In Tolerance
Pres Amb. (mm Hg)	748.75	749.20	0.45	1.8	0.25	In Tolerance
Pres Zero (mm Hg)	0.45	0.10	-0.35	1.8	0.19	In Tolerance
Temperature Std SN	300907	Std Cal Date	3-Jul-2019	Std Cal Due Date	2-Jul-2020	
Pressure Std SN	2981392	Std Cal Date	19-Jul-2019	Std Cal Due Date	18-Jul-2020	

Calibrated Volume (cc):	58.9742	Depth Rod SN	Depth Rod Cal Date	Depth Rod Cal Due Date	Gauge Block SN	Gauge Block Cal Date	Gauge Block Cal Due Date
		60014472	17-Dec-19	16-Dec-20	GB-206259	15-May-19	13-May-24

As Shipped Flow Verification (Functionality Test)[4]						
Nominal Flow sccm [1]	Ref. Std.	Instrument Under Test	Deviation %	Allowable Deviation [2]	E_N [3]	Tolerance
50000	50011	49907	-0.21%	0.48%	0.43	In Tolerance
5000	5013.5	5011.7	-0.04%	0.48%	0.07	In Tolerance
500	504.09	504.44	0.07%	0.48%	0.14	In Tolerance
Flow Standard Serial Number	Std Model	Std Cal Date	Std Cal Due Date			
103521	ML-800-44	12-Jun-2019	11-Jun-2020			

1. The flow rate at a standard temperature of 0ºC and pressure of 760 mmHg

2. Allowable Deviation for the Flow Verification refers to the RSS of total estimated uncertainty for the Instrument Under Test, the Reference Standard and the test uncertainty.

3. En values ≤ 1 indicate that the two flow measurements agree with each other within uncertainty expectations

4. If values in As Shipped are the same as those in the As Received, it indicates all parameters were within tolerance and required no adjustments by Mesa.

As Shipped Temperature and Pressure Calibration[4]						
	Reference Standard	Instrument Under Test	Deviation	Allowable Deviation	E_N [3]	Tolerance
Bath Set Temp. 16.5 (ºC)	16.59	16.50	-0.09	0.5	0.18	In Tolerance
Bath Set Temp. 22.5 (ºC)	22.52	22.50	-0.02	0.5	0.04	In Tolerance
Bath Set Temp. 28.5(ºC)	28.51	28.50	-0.01	0.5	0.02	In Tolerance
Pres Amb. (mm Hg)	748.75	748.70	-0.05	1.8	0.03	In Tolerance
Pres Zero (mm Hg)	0.45	0.40	-0.05	1.8	0.03	In Tolerance
Temperature Std SN	300907	Std Cal Date	3-Jul-2019	Std Cal Due Date	2-Jul-2020	
Pressure Std SN	2981392	Std Cal Date	19-Jul-2019	Std Cal Due Date	18-Jul-2020	

Flow/ Temp/ Pressure Calibration Technician	Abdus Subhan
Dimensional Calibration Technician	Bill Mury

MesaLabs

NVLAP®

NVLAP Lab Code 200661-0
Calibration

Met Lab® Calibration Certificate

Model.	ML-500-10
Serial No.	123433
Calibration Date.	May 11, 2020
Report No.	19514
Supersedes Report No.	18214

Sold To.
Air Compliance Testing, Inc.
PO Box 41156
Cleveland OH 44141
United States
PO No. 1050412

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The Met Lab ML-500 is a true primary volumetric flow standard. Temperature and pressure corrections are applied to the volumetric flow readings to obtain standardized flow readings. The ML-500-10 is rated with a standardized accuracy of ±0.40%, the ML-500-24 is rated at ±0.35%, and the ML-500-44 is rated at ±0.45%. All with a coverage factor of k=2 for a confidence interval of approximately 95%. The flow cells described above are dimensionally calibrated against NIST-traceable standards. The temperature and pressure sensors are also calibrated against NIST-traceable standards. Calibration certificates for the standards used in this calibration are available upon request. The diameter, length, temperature, and pressure are tested in accordance with procedure numbers PR12-01, PR12-02, PR12-04 and PR12-05.

A flow verification test is performed on all ML-500 flow cells per procedure number PR12-17 using high purity nitrogen or filtered laboratory air to ensure proper operation in typical laboratory conditions.

Expanded uncertainty:

Temperature	±0.04 °C
Absolute Pressure	±24 Pa
Length (note 1)	±0.014%
Diameter (note 1)	±0.007%

All at two times coverage factor of k=2 for a confidence interval of approximately 95%.

Note 1 – Length and Diameter uncertainty are accredited measurements only as part of Mesa Laboratories' flow measurement accreditation.

Laboratory Environment:

Temperature Ambient:	22.40 °C	Pressure Ambient:	746.70 mmHg

By:

Mohammed Aziz
Dir. Of Engineering
Mesa Laboratories, Inc., Butler, NJ

Calibration Certificate

Report Number 19514

Measurements for: ML-500-10 SERIAL #: 123433

Date May 11, 2020

As Received Flow Verification (Functionality Test)						
Nominal Flow sccm [1]	Ref. Std. SN 103743	Instrument Under Test	Deviation %	Allowable Deviation [2]	E_N [3]	Tolerance
500	500.56	501.01	0.09%	0.44%	0.20	In Tolerance
90	90.603	90.664	0.07%	0.44%	0.15	In Tolerance
15	15.182	15.167	-0.10%	0.44%	0.22	In Tolerance
Flow Standard Serial Number	Std Model	Std Cal Date	Std Cal Due Date			
103743	ML-800-10	5-May-2020	5-May-2021			

As Received Temperature and Pressure Verification						
	Reference Standard	Instrument Under Test	Deviation	Allowable Deviation	E_N [3]	Tolerance
Bath Set Temp. 22.5 (^{0}C)	22.52	22.50	-0.02	0.5	0.04	In Tolerance
Pres Amb. (mm Hg)	747.90	748.70	0.80	1.8	0.44	In Tolerance
Pres Zero (mm Hg)	0.56	0.20	-0.36	1.8	0.20	In Tolerance
Temperature Std SN	300907	Std Cal Date	3-Jul-2019	Std Cal Due Date	2-Jul-2020	
Pressure Std SN	2981392	Std Cal Date	19-Jul-2019	Std Cal Due Date	18-Jul-2020	

1. The flow rate at a standard temperature of 0^{0}C and pressure of 760 mmHg

2. Allowable Deviation for the Flow Verification refers to the RSS of total estimated uncertainty for the Instrument Under Test, the Reference Standard and the test uncertainty.

3. En values ≤ 1 indicate that the two flow measurements agree with each other within uncertainty expectations

Calibrated Volume (cc):	4.1227

As Shipped Flow Verification (Functionality Test)[4]						
Nominal Flow sccm [1]	Ref. Std.	Instrument Under Test	Deviation %	Allowable Deviation [2]	E_N [3]	Tolerance
500	500.56	501.01	0.09%	0.44%	0.20	In Tolerance
90	90.603	90.664	0.07%	0.44%	0.15	In Tolerance
15	15.182	15.167	-0.10%	0.44%	0.22	In Tolerance
Flow Standard Serial Number	Std Model	Std Cal Date	Std Cal Due Date			
103743	ML-800-10	5-May-2020	5-May-2021			

As Shipped Temperature and Pressure Calibration[4]						
	Reference Standard	Instrument Under Test	Deviation	Allowable Deviation	E_N [3]	Tolerance
Bath Set Temp. 16.5 (^{0}C)	16.60	16.50	-0.10	0.5	0.20	In Tolerance
Bath Set Temp. 22.5 (^{0}C)	22.52	22.50	-0.02	0.5	0.04	In Tolerance
Bath Set Temp. 28.5(^{0}C)	28.50	28.50	0.00	0.5	0.00	In Tolerance
Pres Amb. (mm Hg)	747.90	748.70	0.80	1.8	0.44	In Tolerance
Pres Zero (mm Hg)	0.56	0.20	-0.36	1.8	0.20	In Tolerance
Temperature Std SN	300907	Std Cal Date	3-Jul-2019	Std Cal Due Date	2-Jul-2020	
Pressure Std SN	2981392	Std Cal Date	19-Jul-2019	Std Cal Due Date	18-Jul-2020	

1. The flow rate at a standard temperature of 0^{0}C and pressure of 760 mmHg

2. Allowable Deviation for the Flow Verification refers to the RSS of total estimated uncertainty for the Instrument Under Test, the Reference Standard and the test uncertainty.

3. En values ≤ 1 indicate that the two flow measurements agree with each other within uncertainty expectations

4. If values in As Shipped are the same as those in the As Received, it indicates all parameters were within tolerance and required no adjustments by Mesa.

Flow/ Temp/ Pressure Calibration Technician	Abdus Subhan
Dimensional Calibration Technician	Alfred Habazai

MesaLabs

NVLAP

NVLAP Lab Code 200661-0
Calibration

Met Lab® Base Calibration Certificate

Model ML-500-B
Serial No. 122543
Calibration Date 13-May-2020
Report No. 19523
Supersedes Report No. 18212
Sold to:
Air Compliance Testing, Inc.
PO Box 41156
Cleveland OH 44141
PO No. PO1050412

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The Met Lab ML-500 is a true primary flow standard. A separate calibration certificate is supplied with the flow measuring cell(s). The Clock Period of the timing crystal contained in the ML-500 base unit described above has been tested against NIST-traceable standards to verify its accuracy. Calibration certificates for the standard(s) used in this calibration are available upon request.

As Received Clock Period Data. Clock Period tested in accordance with procedure number PR12-03.

DUT Clock Period (ms)	Target Clock Period (ms)	Allowable Deviation: ± 0.05 ms	Condition
100.495	100.500	0.00	In Tolerance

Frequency Std SN	Calibration Date	Calibration Due Date
218268	5-Jun-2019	5-Jun-2020

As Shipped Clock Period Data. Clock Period tested in accordance with procedure number PR12-03.

DUT Clock Period (ms)	Target Clock Period (ms)	Allowable Deviation: ± 0.05 ms	Condition
100.495	100.500	0.00	In Tolerance

Frequency Std SN	Calibration Date	Calibration Due Date
218268	5-Jun-2019	5-Jun-2020

Expanded uncertainty:
Clock Period ± 31 ppm. With a coverage factor of k=2 for a confidence interval of approximately 95%.
Laboratory Environment:
Temperature Ambient: 22.5°C Pressure Ambient: 759.87mmHg

By:

Mohammed Aziz
Dir. Of Engineering
Mesa Laboratories, Inc., Butler, NJ

Appendix C.4
Accreditation Information/Certifications

American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 11th day of February 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3925.01
Valid to February 28, 2022

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

MONTROSE
ENVIRONMENTAL

Qualified Individual Conformance Statement

I Jon Grech, as a QI (Qualified Individual) sign this Conformance Statement to verify that each of the test projects that I perform, and each of the test projects performed under my supervision will conform with the Montrose Air Quality Services Management System, the test methods applicable to the testing, and ASTM D 7036-04.

I realize that as a Qualified Individual I have the proper knowledge to perform these tests correctly, and that I am held to a high standard of integrity.

Jon Grech

QI Signature

9.24.15

Date

MONTROSE
ENVIRONMENTAL

Qualified Individual Conformance Statement

I Matthew McDivitt, as a QI (Qualified Individual) sign this Conformance Statement to verify that each of the test projects that I perform, and each of the test projects performed under my supervision will conform with the Montrose Air Quality Services Management System, the test methods applicable to the testing, and ASTM D 7036-04.

I realize that as a Qualified Individual I have the proper knowledge to perform these tests correctly, and that I am held to a high standard of integrity.

Matt McDivitt
QI Signature

10-15-2015
Date

Qualified Individual Conformance Statement

I Robert Sava, as a QI (Qualified Individual) sign this Conformance Statement to verify that each of the test projects that I perform, and each of the test projects performed under my supervision will conform with the Montrose Air Quality Services Management System, the test methods applicable to the testing, and ASTM D 7036-04.

I realize that as a Qualified Individual I have the proper knowledge to perform these tests correctly, and that I am held to a high standard of integrity.

[signature]

QI Signature

9-25-15

Date

CERTIFICATE OF COMPLETION

Jonathan Grech

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

Source Evaluation Society Group 3: *EPA Gaseous Pollutants Instrumental Methods*

Certificate Number: 011-2017-13

Tate Strickler, Accreditation Director

DATE OF ISSUE: 8/4/17

DATE OF EXPIRATION: 8/4/22

MONTROSE ENVIRONMENTAL

CERTIFICATE OF COMPLETION

Matthew McDivitt

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

Source Evaluation Society Group 1: *EPA Manual Gas Volume and Flow Measurements and Isokinetic Particulate Sampling Methods*

Certificate Number: 011-2018-11

Tate Strickler, Accreditation Director

DATE OF ISSUE: 4/13/18

DATE OF EXPIRATION: 4/13/23

MONTROSE ENVIRONMENTAL

CERTIFICATE OF COMPLETION

Robert Sava

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

EPA Method 205

Certificate Number: 011-2021-16

Tate Strickler, VP – Quality Systems

DATE OF ISSUE: 5/12/21

DATE OF EXPIRATION: 5/12/26

MONTROSE ENVIRONMENTAL

CERTIFICATE OF COMPLETION

Robert Sava

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

Source Evaluation Society Group 1: *EPA Manual Gas Volume and Flow Measurements and Isokinetic Particulate Sampling Methods*

Certificate Number: 011-2020-47

Tate Strickler, VP – Quality Systems

DATE OF ISSUE: 12/30/20

DATE OF EXPIRATION: 12/29/25

MONTROSE ENVIRONMENTAL

CERTIFICATE OF COMPLETION

Robert Sava

This document certifies that this individual has passed a comprehensive examination and is now a Qualified Individual (QI) as defined in Section 8.3 of ASTM D7036-04 for the following method(s):

Source Evaluation Society Group 3: *EPA Gaseous Pollutants Instrumental Sampling Methods*

Certificate Number: 011-2021-3

Tate Strickler, VP – Quality Systems

DATE OF ISSUE: 2/2/21

DATE OF EXPIRATION: 2/1/26

MONTROSE ENVIRONMENTAL

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APPENDIX D
REGULATORY INFORMATION

Cleveland, Ohio
www.montrose- environmental.com
1-800-EPA-AIR1

April 29, 2021
Revised: May 11, 2021

Kelly Kanoza
ARAQMD
1867 W Market St
Akron, OH 44303

Kelly:

This letter accompanies the attached Intent to Test (ITT) Notification Form that we have completed on the behalf of our client, OMNOVA Solutions Inc., a Synthomer Company (OMNOVA), located in Mogadore, OH. The purpose of this emissions testing project is to satisfy the testing requirements pursuant to Ohio Environmental Protection Agency (OEPA) Title V Permit P0115761.

The scope of this testing project is to determine destruction efficiency (DE) by simultaneously measuring Total Gaseous Organics (TGO) using EPA Method 25A from the Poly/Degas Process (P004) at the T-OX Inlet Duct and T-OX Exhaust Stack. The above testing will be conducted while operating at or near maximum capacity.

Please note the following regarding this scope of work:

- Single point EPA Method 3 and 4 sampling will be utilized at the T-OX Inlet Duct and T-OX Exhaust Stack sampling locations.
- EPA Method 205 (calibration gas dilution) and ALT007 (sample gas dilution) will be utilized where applicable during this test event.

June 8, 2021 has been selected as the test day with testing equipment set-up occurring on the day before. Run No. 1's start time is targeted for 9:00. If this start time changes, Montrose Air Quality Services or facility personnel will contact you in advance to notify you of the new starting time.

If you have any questions regarding the scope of this testing project, the scheduled test day, or the processes being tested, please don't hesitate to call Doug Oblak of OMNOVA at 330-628-6443, or myself, and we would be happy to assist you in any way possible.

Thank you again for your careful consideration, and I am looking forward to working with you on this upcoming testing project.

Sincerely,

Robert H. Sava, Jr.
Client Project Manager
Montrose Air Quality Services

cc: Doug Oblak, OMNOVA

INTENT TO TEST NOTIFICATION (One Emissions Unit Per Sheet)

Agency use only	
Date Received	
Assigned	

Facility Premise No. **16-67-00-0007**

Emissions Unit PTI No. **Title V Permit P0115761**

SCC Number **3-01-026-01**

Proposed Test Date **June 8, 2021**

Proposed Start Time **9:00**

A. Facility Contact Information:

Name **OMNOVA Solutions Inc., a Synthomer Company**

Address **165 S Cleveland Ave, Mogadore OH 44260**

Contact Person **Doug Oblak**

Telephone (O) **330-628-6443** (Cell) **330-388-2954**

E-Mail **doug.oblak@synthomer.com**

Testing Firm Information:

Name **Montrose Air Quality Services**

Address **PO Box 41156, Cleveland OH 44141-0156**

Contact Person **Robert Sava**

Telephone (O) **800-372-2471** (Cell) **216-401-0399**

E-Mail **rsava@montrose-env.com**

B. Test Location Information

Name **OMNOVA Solutions Inc., a Synthomer Company**

Contact Person **Doug Oblak**

Address **165 S Cleveland Ave, Mogadore OH 44260**

Telephone (O) **330-628-6443** (Cell) **330-388-2954**

C. Test Plan and Emissions Unit Information Table: List the applicable information under each respective column heading.

Emission Unit	StackID	Test Location	Control Equipment	Monitoring Equipment	Pollutant(s) to be Tested	EPA Test Methods	Number of Sampling Points	Total Time per Test Run (min)	Number of Sampling Runs
Poly/Degas Process (P004)	A	T-OX Inlet Duct	N/A	N/A	Stack Gas Velocity and Volumetric Flow Rate	1 and 2D	1 (Orifice Plate Pressure Differential)	60	3
					Dry Molecular Weight and Moisture	3 and 4	1	60	3
					Total Gaseous Organics	25A	1	60	3
	B	T-OX Exhaust Stack	Thermal Oxidizer	Temperature	Stack Gas Velocity and Volumetric Flow Rate	1 and 2	Up to 16	10	3
					Dry Molecular Weight and Moisture	3 and 4	1	60	3
					Total Gaseous Organics	25A	1	60	3

Ohio EPA 12/07

Are *any* modifications or alternatives as spelled within the test methods being proposed? **Yes [X] No [ ]** If "no", then no modifications or alternatives, however minor, will be accepted. If yes, list each test method and section being modified, and attach a detailed modification description and justification. **See cover letter**

Source is testing to comply with (check all that apply): **Title V Permit P0115761**

D. What is the maximum rated capacity or throughput of the emissions unit given its permit-to-install or permit-to-operate? **260 million dry pounds per year**

Has the facility scheduled production or throughput so that the emissions unit can be operated at the maximum capacity given its permit-to-install or permit-to-operate during the test? **Yes [X] No [ ]**

Specify how the operating rate will be demonstrated during the testing: **Normal facility process and recordkeeping procedures**

Sampling Location(s): **Inlet [X] Outlet [X] Simultaneous [X]** Will cyclonic flow check(s) be conducted? **Yes [X] No [ ] Where applicable**

Fuel Sampling: **Coal-Proximate [ ] Ultimate [ ] Other [ ] If other specify: N/A**

Emission Rate to be calculated using: **F-Factor [ ] Ultimate Coal Analysis [ ] Other [X] If other specify: As dictated by EPA Method 25A calculation algorithms**

Has any maintenance or parts replacement been performed on the emissions unit or the control equipment within the last year? **Yes [X] No [ ]**

(Note: Some maintenance, such as installing new filter bags in a baghouse, or replacing the activated carbon in an adsorber, may disqualify the emissions unit from a performance test until a sufficient amount of time has elapsed to ensure a test which will be representative of normal operations.)

E. Sample Train Calibration: All affected measuring and monitoring equipment should be calibrated within 60 days of the scheduled testing.

THIS IS THE LAST PAGE OF THIS DOCUMENT

If you have any questions, please contact one of the following individuals by email or phone.

Name: Mr. Robert J. Lisy, Jr.
Title: District Manager
Region: Midwest
Email: rlisy@montrose-env.com
Phone: 440-262-3760

Name: Mr. Robert H. Sava, Jr.
Title: Client Project Manager
Region: Midwest
Email: rsava@montrose-env.com
Phone: 440-262-3760

Public Notice
Ohio Environmental Protection Agency
Draft State Implementation Plan
VOC Reasonably Available Control Technology (RACT)
for Synthomer Inc. (Facility ID 1667000007)

Portage County

Notice is hereby given that the Director of the Ohio Environmental Protection Agency, (Ohio EPA) is submitting to the United States Environmental Protection Agency (U.S. EPA) Reasonably Available Control Technology (RACT) for Synthomer Inc. (Facility ID 1667000007) for approval into Ohio's state implementation plan (SIP) for the 2015 ozone National Ambient Air Quality Standard (NAAQS).

On March 17, 2025, Ohio submitted a revision to Ohio's SIP to address RACT requirements for the 2015 8-hour ozone NAAQS. As noted in this submittal, OAC rule 3745-21-11(B) requires facilities that have the potential to emit of fifty tons per year or more, but less than one hundred tons per year of volatile organic compounds (VOC) and are located in nonattainment counties to submit a RACT study for sources not controlled by Ohio's CTG regulations in OAC Chapter 3745-21 or by categorical non-CTG RACT in OAC rules 3745-21-12, 3745-21-14, 3745-21-16, 3745-21-21 and 3745-21-25.

Ohio is now submitting source-specific VOC RACT for Synthomer Inc. (Facility ID 1667000007) for approval into Ohio's SIP. This facility is located in the Cleveland 2015 ozone maintenance area and has no prior existing source-specific RACT established in OAC rule 3745-21-09.

The updated RACT Study was submitted per OAC rule 3745-21-11(B). Ohio has determined that the updated RACT study, along with supplemental information submitted subsequently, is sufficient to justify maintaining the continued use of the existing Regenerative Thermal Oxidizer which achieves 98% control along with good operating practices for Emissions Unit Group 1 proposed by the facility to act as RACT under the 2015 ozone standard.

Ohio EPA is now requesting approval of the proposed RACT for Synthomer Inc. into Ohio's SIP.

Ohio EPA is seeking public comment to satisfy U.S. EPA requirements for public involvement in SIP related activities in accordance with 40 CFR 51.102.

The public comment period will run until September 14, 2026. Written comments should be submitted at: https://ohioepa.commentinput.com - Search by entering the permit # (P0140919 for Synthomer Inc.) in the "Search Projects" search box.

A public hearing on this action may be requested by contacting Kathryn Jobe at 614-728-0671 or kathryn.jobe@epa.ohio.gov no later than 30 days from the draft public notice. If a public hearing is requested, a new notification will be published to identify the time and location of the public hearing. The public hearing will be held at least 30 days after the date of the new notification.

All interested persons are entitled to comment on these changes. All comments submitted to the above address by the close of business September 14, 2026. will be considered by Ohio EPA prior to final action on this action. Written statements submitted after this time period may be considered as time and circumstances permit but will not be part of the official record.

Questions or comments about this document should be directed to Kathryn Jobe at 614-728-0671 or kathryn.jobe@epa.ohio.gov.

Environmental Protection Agency

EPA.Ohio.gov

Mike DeWine, *Governor* Jim Tressel, *Lt. Governor* John Logue, *Director*

DATE

Ms. Anne Vogel
Regional Administrator
U.S. EPA, Region 5
77 West Jackson Blvd.
Chicago, Illinois 60604

Re: Revision to Ohio's Reasonably Available Control Technology (RACT) State Implementation Plan for the 2015 Ozone National Ambient Air Quality Standards – Source-Specific VOC RACT for Synthomer Inc. (Facility ID 1667000007)

Dear Administrator Vogel:

On March 17, 2025, Ohio submitted a revision to Ohio's State Implementation Plan (SIP) to address Reasonably Available Control Technology (RACT) requirements for the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) for areas classified as serious. As noted in this submittal, Ohio EPA adopted requirements in OAC rule 3745-21-11 for facilities in the nonattainment areas that emit fifty hundred tons per year or more, but less than one hundred tons per year of VOC from sources not controlled by Ohio's CTG regulations in OAC Chapter 3745-21 or by categorical non-CTG RACT in OAC rules 3745-21-12, 3745-21-14, 3745-21-16, 3745-21-21 and 3745-21-25 to submit an updated RACT study within one year of the effective date of the rule. Upon review of the RACT study, Ohio EPA evaluated if the RACT proposed by the facility is appropriate to satisfy RACT requirements under the 2015 ozone standard.

Ohio is now submitting source-specific VOC RACT for Synthomer Inc. (Facility ID 1667000007) for approval into Ohio's SIP. This facility is located in the Cleveland 2015 ozone maintenance area and has no prior existing source-specific RACT established in OAC rule 3745-21-09.

The updated VOC RACT Study was submitted per OAC rule 3745-21-11. Ohio has determined that the updated RACT study, along with supplemental information submitted subsequently, is sufficient to justify maintaining the continued use of the existing Regenerative Thermal Oxidizer which achieves 98% control along with good operating practices for Emissions Unit Group 1 proposed by the facility to act as RACT under the 2015 ozone standard. The RACT study is provided in Appendix A, and the permit that incorporated RACT is provided as Appendix B. Within the permit, we have highlighted the terms and conditions associated with RACT and request only those provisions are subject to this SIP revision request. Appendix C provides the permit strategy write-up for the permit.

50 W. Town Street
Suite 700
Columbus, Ohio 43215 U.S.A.

614 | 644 3020
epa.ohio.gov

Ohio held a public comment period on Ohio's RACT determination from August 13 to September 14, 2026. Appendix D contains the public notice. ***[Ohio's response to comments received during the public comment period is in Appendix E/No comments were received during the public comment period].***

This SIP does not include the relaxation of any existing requirements and therefore will not interfere with the attainment or maintenance of the NAAQS in accordance with section 110(l) of the CAA.

Ohio EPA is now requesting approval of the proposed RACT for Synthomer Inc. into Ohio's SIP.

Ohio EPA is submitting this SIP via U.S. EPA's State Planning Electronic Collaboration System (SPeCS). If you have questions, please contact Jennifer Van Vlerah in our Division of Air Pollution Control at (614) 644-3696.

Sincerely,

John Logue
Director

Cc: Bob Hodanbosi, Chief, Division of Air Pollution Control, Ohio EPA

Enclosures