PERFORMANCE TEST REPORT
EMISSION FACTOR VERIFICATION
ADVANCED MATERIAL RECYCLING SYSTEM (AMRS)
(EU-144)

CONDUCTED AT:

GEORGIA-PACIFIC TOLEDO, LLC

PREPARED FOR:

GEORGIA-PACIFIC TOLEDO, LLC
1400 SE BUTLER BRIDGE ROAD
TOLEDO, OREGON 97391

PREPARED BY:

ADVANCED INDUSTRIAL RESOURCES, INC.
3407 NOVIS POINTE
ACWORTH, GEORGIA 30101
PROJECT ID: KR - 11456

TEST DATES:
JULY 12, 2023

REPORT CERTIFICATION SHEET

Having conducted the Technical Review of this report, I hereby certify the data, information, results, and calculations in this report to be accurate and true according to the methods and procedures used.

September 8, 2023
Date

Derek Stephens
VP/QA Director
Advanced Industrial Resources

Having written and prepared this report, I hereby certify that the data, information and results in this report to be correct and all inclusive of the necessary information required for a complete third-party review of the testing event.

September 8, 2023
Date

Cindy Wu
Report Preparation
Advanced Industrial Resources

Having supervised all aspects of the field testing, I hereby certify the equipment preparation, field sample collection procedures, and all equipment calibrations were conducted in accordance to the applicable methodologies.

September 8, 2023
Date

Dan Kirk
Field Project Supervisor
Advanced Industrial Resources

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APPENDICES

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

Georgia-Pacific Toledo, LLC operates a pulp and paper facility located at 1400 SE Butler Bridge Road, Toledo, Oregon 97391. The facility produces containerboard products from "brown stock". The facility is comprised of all normal paper industry processes except for the pulp bleaching processes.

This document represents the Test Report for the test program to determine whether the Advanced Material Recycling System (AMRS) (EU-144) stack exhaust is operating in compliance with the applicable emissions limits and to verify emission factors established in the facility's air quality permit (Permit No. 21-0005-TV) for Volatile Organic Compounds (VOC), and Methanol/Formaldehyde in addition to Hazardous Air Pollutants (HAPs) as phenol, acetaldehyde, acrolein, and propionaldehyde.

Testing was conducted July 12, 2023, in accordance with an Oregon Department of Environmental Quality (ODEQ) and EPA approved test protocol. All testing was conducted by Advanced Industrial Resources, Inc. (*AIR*) in accordance with approved USEPA Methods (i.e., 40 CFR Part 60 Appendix A, Methods 1, 2, 3A, 4, 25A) and NCASI Method 105.01.

1.2 KEY PERSONNEL

The key personnel who coordinated the test program and their telephone numbers are:

Scott Austin, *Georgia-Pacific Toledo, LLC*	541-336-8318
Scott Wilson, Program Director – *AIR*	800-224-5007
Derek Stephens, MSEE, VP/QA Director – *AIR*	404-843-2100
Ross Winne, Technical Director – *AIR*	404-843-2100
Steven Haigh, Report Preparation Director – *AIR*	404-843-2100
Dan Kirk, Field Project Supervisor, *AIR*	404-843-2100
Cindy Wu, Technical Project Manager, *AIR*	225-776-7788

2.0 PROCESS AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION

The AMRS (EU-144) is operated in a new processing building constructed near the existing #4 boiler and extracts usable cellulose fiber from mixed solid waste streams that include food, paper, plastics, glass, and metals. OCC rejects can be added to the solid waste stream as it enters the process; however, it is not currently a typical feedstock for operations.

All of the raw materials are collected, baled, and wrapped at an offsite solid waste collection facility. The sealed, plastic wrapped bales are delivered by truck to the Toledo mill where the raw material is unloaded and stored outside of the processing building.

The municipal solid waste streams are staged at predesignated third-party operated transfer stations that are licensed to handle municipal solid waste from commercial and residential sources. The transfer stations have mechanisms in place for both prevention, detection, and removal of hazardous wastes, used oils, asbestos-containing materials, and any other inappropriate solid waste streams. Thus, the AMRS process does not receive or accept hazardous wastes, asbestos-containing materials, or other inappropriate solid waste streams.

At the mill site, the raw material is fed into a rotating autoclave which is a steam pressurized vessel with an internal rotating drum that processes and breaks down the raw materials during the two-hour batch cycle. The system utilizes a proprietary process that sanitizes the feedstock and separates paper fiber from the other commodities inherent in the feedstock stream. Although elevated, the maximum temperature of 270 degrees Fahrenheit in the autoclave is not high enough to decompose wood so the wood fibers in the raw materials or OCC rejects, if processed, leaves the autoclave as fiber in a slurry form. The design capacity of the AMRS is 50,000 lbs/batch of feedstock.

The fiber recovered from the AMRS is sent to the existing OCC plant in slurry form and is further cleaned and refined along with the regular OCC feedstock. The fiber recovered through the AMRS replaced a portion of the OCC wastepaper that is currently brought to and processed in the OCC plant.

Any metals and other residual materials that are not recovered as fiber during the AMRS process are collected, sorted, and sent to off-site recycling facilities or to an off-site

industrial landfill. Any effluent arising from the process are treated in the company's existing wastewater treatment system.

The overall process emissions are controlled first by packed bed tower scrubber followed by a carbon bed and then vented out of a single stack. The carbon bed also controls the building exhaust. The scrubber operating parameters pressure drop ("W.G.) and scrubber liquid rate (gpm), as well as the carbon absorption filters' pressure drop, are recorded during each test run for the AMRS.

2.2 SAMPLING LOCATION DESCRIPTION

The AMRS EU-144 carbon filter stack exhaust is circular and has an internal diameter of 39.0 inches and the sampling ports are located 120" upstream (3.1 equivalent diameters) from the stack exhaust (upstream disturbance), and 240" downstream (6.2 equivalent diameters) from the exhaust fan (downstream disturbance). The exhaust stack is equipped with a minimum of two sampling ports oriented 90 degrees to one another on a parallel plane oriented perpendicular to the exhaust gas flow direction.

EPA Method 25A and NCASI Method 105.01 was sampled in accordance with Method 25A Section 8.2, the centroidal region of the sampling locations was used for VOC emission concentration measurements.

3.0 SUMMARY AND DISCUSSION OF TEST RESULTS

3.1 OBJECTIVES AND TEST MATRIX

Emission factor verification (EFV) performance testing was conducted to confirm source emissions are as expected from the initial unit's permit application and as established in the facility's permit under the plant site emission limits (PSEL) according by permit condition 93. Performance testing was conducted for volatile organic compounds (VOCs) and hazardous air pollutants (HAPs). The total VOC is the sum of total hydrocarbons, methanol, and formaldehyde in accordance with Equation A-1 of ODEQ Guidance for Evaluating VOC emissions. Additional HAPs were also conducted for phenol, acetaldehyde, acrolein, and propionaldehyde.

3.2 FIELD TEST CHANGES, PROBLEMS, & ITEMS OF NOTE

The testing was conducted in accordance with the ODEQ approved Source Test Plan. No problems were encountered during testing that required deviation from the planned test protocol.

3.3 PRESENTATION OF TEST RESULTS

Emission Factor Verification emission rates are summarized in Table 3-1 and additional HAPs results are summarized in Table 3-2. Complete emission concentrations and mass rates are presented in Appendix A. Reduced and tabulated data from the field-testing is included in Appendix B. The calculations and nomenclature used to reduce the data are presented in Appendix C. Actual raw field data sheets are presented in Appendix D. Laboratory reports and custody records are presented in Appendix E.

TABLE 3-1: Emission Factor Verification Results Summary

Source	Pollutant	Average Measured	Emission factor	Units	% of Allowable
Advanced Material Recycling System (AMRS) (EU-144)	VOC (as THC, C_3H_8)	0.21	0.40	lb/ton MSW	54%
	Methanol	0.0140	NA		NA
	Formaldehyde	J 6.27E-05			
	Total VOC (THC + HAPs)(1)	0.228	0.246		93%

Note:

- (1) Total VOC Mass Rates = $THC_{(as\ propane)}$ + Methanol + Formaldehyde in accordance with Equ. A-1 Attachment 1 of ODEQ Guidance for Evaluating VOC Emissions.
- (< or ND) indicates the analyte was a non-detect or below the MDL, results displayed are the result of the the MDL.
- (J) indicates the analyte was between the MDL and LOQ, the laboratory can positively identify the analyte as present but value is considered to be an estimate.

TABLE 3-2: Additional HAPs Result Summary

Source	Pollutant	Average Measured	Emission factor	Units	% of Allowable
Advanced Material Recycling System (AMRS) (EU-144)	Phenol	J 5.30E-04	NA	lb/ton MSW	NA
	Acetaldehyde	0.0106			
	Acrolein	< 1.91E-05			
	Propionaldehyde	J 3.36E-05			

3.4 PROCESS MONITORING

Testing was conducted while the applicable processes were operating at a target rate of 18 bales, which represents normal operating conditions. During testing, the process ran exclusively on municipal solid waste (MSW) feedstock. OCC rejects is not a current typical feedstock. GP Toledo ensured that all essential process monitoring equipment was operating properly and recording data throughout the test period to provide process operating rates necessary to determine process weight-based emission rates, as applicable. At a minimum, the facility monitored and recorded during each test run for AMRS EU-144, the scrubber operating parameters pressure drop ("H2O), scrubber liquid flow rate (gpm), damper position, as well as the carbon absorption filters' pressure drop, and the operating rate. The number of batches processed since the last carbon media replacement was recorded during the 12-consective monthly batch cycle tests. This information is presented in Appendix G.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

Performance testing was conducted according to the methodology in the *Title 40 Code of Federal Regulation*, Part 60, Appendix A as applicable. Specifically:

- EPA Method 1 was used for the qualification of the location of sampling ports and for the determination of the number and positions of stack traverse points, as applicable to sample traverses for Method 2.

- EPA Method 2 was employed for the determination of the stack gas velocity and volumetric flow rate during stack sampling using the Type "S" Pitot tube.

- Method 3 and 3A were used for the calculation of the density and dry molecular weight of the effluent stack gas.

- EPA Method 4 was used for the determination of moisture content. ODEQ Method 4 (ODEQ4) was used as the 2nd method for determining the moisture content of the stack gas. Specifically, ODEQ4 Equations 4.4-1 and 4.4-2 were used to calculate the theoretical maximum moisture content of the stack gas. The lower of these two values (actual vs. theoretical) was used for calculating dry standard volumetric flow rates (dscfm) and correcting Total Hydrocarbon (THC) emission concentrations to a dry basis.

- EPA Method 25A was used for the determination of volatile organic compounds (VOCs), measured as total hydrocarbons (THC) on a propane calibration basis.

- NCASI Method 105.01 was used to determine methanol, formaldehyde, phenol, acetaldehyde, acrolein, and propionaldehyde emissions. Source gas was drawn through midget impingers, each containing chilled, organic-free water. Formaldehyde and methanol were absorbed by the water. To ensure QA/QC, a collocated duplicate sample train was operated simultaneously during each test run. The first test run was operated as a duplicate sample while the 2nd and 3rd runs were spiked with known quantities.

5.0 QUALITY ASSURANCE ACTIVITIES

The quality assurance/quality control (QA/QC) measures associated with the sampling and analysis procedures given in the noted EPA reference methodologies, in Subparts A of 40 CFR Part 60 and 40 CFR Part *63*, and in the *EPA QA/QC Handbook*, Volume III (EPA 600/R-94/038c) were employed, as applicable. Such measures included, but were not limited to, the procedures detailed below.

5.1 PITOT TUBE FACE PLANE ALIGNMENT CHECK

Before field testing, each Type S Pitot tube was examined in order to verify that the face planes of the tube were properly aligned, per Method 2 of 40 CFR Part 60, Appendix A. The external tubing diameter and base-to-face plane distances were measured in order to verify the use of 0.84 as the baseline (isolated) Pitot coefficient. At that time the entire probe assembly (i.e., the sampling probe, nozzle, thermocouple, and Pitot tube) was inspected in order to verify that its components met the interference-free alignment specifications given in EPA Method 2. Because the specifications were met, then the baseline Pitot coefficient was used for the entire probe assembly.

After field testing, the face plane alignment of each Pitot tube was checked. No damage to the tube orifices was noted.

5.2 METERING SYSTEM CALIBRATION

Annually each dry gas meter (DGM) console is calibrated at five orifice settings according to Method 5 of 40 CFR Part 60, Appendix A. From the calibration data, calculations of the values of Y_m and $\Delta H_@$ are made, and an average of each set of values is obtained. The limit of total variation of Y_m values is ± 0.02, and the limit for $\Delta H_@$ values is ± 0.20.

After field testing, the calibration of the DGM console was checked by performing three calibration runs at a single intermediate orifice setting that is representative of the range used during field-testing. Each DGM was within the limit of acceptable relative variation from Y_m of 5.0%.

5.3 TEMPERATURE GAUGE CALIBRATION

After field testing, the temperature measuring instruments on each sampling train was calibrated against standardized mercury-in-glass reference thermometers. Each indicated temperature was within the limit of acceptable variation between the absolute reference temperature and the absolute indicated temperature of 1.5%.

5.4 GAS ANALYZER CALIBRATION

5.4.1 CALIBRATION GAS CONCENTRATION VERIFICATION

AIR obtained a certificate from the gas manufacturer and confirmed that the documentation included all information required by the Environmental Protection Agency Traceability Protocol No. 1. *AIR* confirmed that the manufacturer certification was complete and current and that calibration gases certifications had not expired. This documentation was available on-site for inspection during testing and is presented in Appendix E.

5.4.2 MEASUREMENT SYSTEM PREPARATION

AIR assembled, prepared, and preconditioned each measurement system by following the manufacturer's written instructions for preparing and preconditioning each gas analyzer and, as applicable, the other system components. *AIR* made all necessary adjustments to calibrate the analyzers and the data recorders and to achieve the correct sampling rate.

5.4.3 ANALYZER CALIBRATION ERROR

After sampling system and analyzer assembly, preparation and calibration, *AIR* conducted a 3-point analyzer calibration error test before the first run. *AIR* introduced the low-, mid-, and high-level calibration gases sequentially in direct calibration mode. During the test, *AIR* made no adjustments to the system except to maintain the correct flow rate. *AIR* recorded the analyzer's response to each calibration gas and calculated the system calibration error. At each calibration gas level (low, mid, and high) the calibration error was within ± 2.0 percent or 0.5 ppm of the calibration span.

5.4.4 INITIAL SYSTEM BIAS AND CALIBRATION ERROR CHECKS

Before sampling began, *AIR* determined that the high-level calibration gas best approximated the emissions and used it as the upscale gas. *AIR* introduced the upscale gas at the probe upstream of all sample conditioning components in system calibration mode. The time it took for the measured concentration to increase to a value that is within 95 percent of the certified gas concentration was recorded. *AIR* continued to observe the gas concentration reading until it reached a final, stable value and recorded the value.

Next, *AIR* introduced the low-level gas in system calibration mode and recorded the time required for the concentration response to decrease to a value that was within 5.0 percent of the certified low-range gas concentration.

AIR continued to observe the low-level gas reading until it reached a final, stable value and recorded the result. *AIR* operated the measurement system at the normal sampling rate during all system bias checks and made only the adjustments necessary to achieve proper calibration gas flow rates at the analyzer. From this data, *AIR* determined the initial system bias was less than 5% of the calibration span for the low- and high- level gases.

5.4.5 MEASUREMENT SYSTEM RESPONSE TIME

AIR calculated the measurement system response time from the data collected during the Initial System Bias Check.

5.5 NCASI 105.01 SPECIFIC QA CHECKS

Field personnel conducted the various method specific quality assurance checks and activities as required in NCASI 105.01. These included operating a collocated sample train for collecting duplicate and spiked samples as well as submitting a reagent blank. The laboratory also analyzed laboratory blanks, laboratory duplicates, and laboratory matrix spike samples. Each of these checks was conducted to verify the sampling systems' integrity and the laboratory's ability to provide accurate analytical data. The duplicate relative deviation and spike recovery assessments are delineated in the applicable Results table of Appendix A as well as within the laboratory report presented in Appendix E.

As previously stated, the first test run's collocated sample train was operated as a duplicate sample while the 2nd and 3rd runs were spiked with known quantities in the first impinger.

5.6 DATA REDUCTION CHECKS

AIR ran an independent check (using a validated computer program) of the calculations with predetermined data before the field test, and the *AIR* Team Leader conducted spot checks on-site to assure that data was being recorded accurately. After the test, *AIR* checked the data input to assure that the raw data had been transferred to the computer accurately

5.7 EXTERNAL QUALITY ASSURANCE

5.7.1 TEST PROTOCOL EVALUATION

A notification was submitted to ODEQ in advance of testing, which provided regulatory personnel the opportunity to review and comment upon the test and quality assurance procedures used in conducting this testing.

5.7.2 ON-SITE TEST EVALUATION

A test schedule was submitted with the notification and ODEQ personnel were notified of all changes in the schedule. No tests were performed earlier than stated in the original schedule. Therefore, regulatory personnel were afforded the opportunity for on-site evaluation of all test procedures.

6.0 DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) process is generally a seven-step iterative planning approach to ensure development of sampling designs for data collection activities that support decision making. The seven steps are as follows: (1) defining the problem; (2) stating decisions and alternative actions; (3) identifying inputs into the decision; (4) defining the study boundaries; (5) defining statistical parameters, specifying action levels, and developing action logic; (6) specifying acceptable error limits; and (7) selecting resource-effective sampling and analysis plan to meet the performance criteria. The first five steps are primarily focused on identifying qualitative criteria such as the type of data needed and defining how the data will be used. The sixth step defines quantitative criteria and the seventh step is used to develop a data collection design. In regards to emissions sampling, these steps have already been identified for typical monitoring parameters.

Monitoring methods presented in 40 CFR Part 60 Appendix A indicate the following regarding DQOs: Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods. At a minimum, each method provides the following types of information: summary of method; equipment and supplies; reagents and standards; sample collection, preservation, storage, and transportation; quality control; calibration and standardization; analytical procedures, data analysis and calculations; and alternative procedures. These test methods have been designed and tested according to DQOs for emissions testing and analysis. These test methods have been specified and were followed in accordance with the test protocol discussed with GP Toledo to ensure that DQOs were met for this project.

APPENDIX A

TEST RESULTS

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Test Results

GP Toledo AMRS

Toledo, OR

Carbon Bed Outlet

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		Units	Run 1	Run 2	Run 3	Averages
Test Date			12-Jul-23	12-Jul-23	12-Jul-23	
Start Time			8:45	12:12	15:29	
End Time			11:45	14:32	18:01	
Start Time Monitor Data			8:45	12:12	15:29	
Stop Time Monitor Data			11:14	14:31	18:00	
P_m	Pressure of meter gases	inches Hg	30.23	30.23	30.23	**30.23**
P_s	Pressure of stack gases	inches Hg	30.14	30.14	30.14	**30.14**
$V_{m(std)}$	Volume of gas sample	dscf	111.62	100.03	107.66	**106.43**
$V_{w(std),meas}$	Meas. volume of water vapor	scf	1.20	0.91	1.79	**1.30**
$B_{ws,meas}$	Measured moisture	dimensionless	0.011	0.009	0.016	**0.012**
$B_{ws,theo}$	Theoretical max. moisture		0.031	0.036	0.036	**0.034**
$B_{ws,act}$	Actual moisture		0.011	0.009	0.016	**0.012**
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	28.84	28.84	28.84	**28.84**
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	28.72	28.74	28.66	**28.71**
v_s	Velocity of stack gas	ft./sec	57.66	57.75	57.85	**57.76**
A_n	Area of nozzle	ft^2	0.000218	0.000218	0.000218	**0.000218**
A_s	Area of stack	ft^2	8.30	8.30	8.30	**8.30**
Gas Stream Flow Rates, Temperature, Oxygen						
Q_a	Vol. Flow rate of actual gas	cfm	28,700	28,747	28,796	**28,748**
Q_w	Vol. Flow rate of wet gas	scfm	28,416	28,253	28,268	**28,312**
Q_w	Vol. Flow rate of wet gas	scfh	1,704,937	1,695,175	1,696,107	**1,698,740**
Q_{sd}	Vol. Flow rate of dry gas	dscfm	28,114	27,997	27,807	**27,973**
T_s	Temperature of stack gas	°F	77	81	82	**80**
% O_2	Percent O2 by volume	percent ($^v/_v$)	20.8	20.7	20.8	**20.8**
Isokinetic Sampling Ratio						
I	Isokinetic sampling ratio	percent	104.9	101.4	102.3	**102.9**
Process Data						
$P_{(product\ input)}$	Product input MSW	ton/batch	19.9	21.2	21.0	**20.7**
$P_{(product\ input)}$	Product input MSW	ton/hr	8.18	8.81	8.59	**8.53**
Methanol Concentrations NCASI 105.01						
Methanol	Conc. Of Methanol in dry stack gas	mg/dscm	0.635	1.22	1.59	**1.15**
		gr/dscf	0.000277	0.000532	0.000695	**0.000502**
Methanol Mass Rates NCASI 105.01						
Methanol	Emission rate of Methanol	lb/hour	0.0669	0.128	0.166	**0.120**
		lb/ton MSW	0.00818	0.0145	0.0193	**0.0140**
Phenol Concentrations NCASI 105.01						
Phenol	Conc. Of Phenol in dry stack gas	mg/dscm	J 0.0323	J 0.0378	0.0597	**0.0432**
		gr/dscf	J 0.0000141	J 0.0000165	0.0000261	**0.0000189**
Phenol Mass Rates NCASI 105.01						
Phenol	Emission rate of Phenol	lb/hour	J 0.00340	J 0.00396	0.00622	**0.00453**
		lb/ton MSW	J 0.000416	J 0.000450	0.000724	**0.000530**

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P_m	Pressure of meter gases	inches Hg	30.23	30.23	30.23	**30.23**
P_s	Pressure of stack gases	inches Hg	30.14	30.14	30.14	**30.14**
$V_{m(std)}$	Volume of gas sample	dscf	111.62	100.03	107.66	**106.43**
$V_{w(std),meas}$	Meas. volume of water vapor	scf	1.20	0.91	1.79	**1.30**
$B_{ws,meas}$	Measured moisture	dimensionless	0.011	0.009	0.016	**0.012**
$B_{ws,theo}$	Theoretical max. moisture		0.031	0.036	0.036	**0.034**
$B_{ws,act}$	Actual moisture		0.011	0.009	0.016	**0.012**
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	28.84	28.84	28.84	**28.84**
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	28.72	28.74	28.66	**28.71**
v_s	Velocity of stack gas	ft./sec	57.66	57.75	57.85	**57.76**
A_n	Area of nozzle	ft^2	0.000218	0.000218	0.000218	**0.000218**
A_s	Area of stack	ft^2	8.30	8.30	8.30	**8.30**
Gas Stream Flow Rates, Temperature, Oxygen						
Q_a	Vol. Flow rate of actual gas	cfm	28,700	28,747	28,796	**28,748**
Q_w	Vol. Flow rate of wet gas	scfm	28,416	28,253	28,268	**28,312**
Q_w	Vol. Flow rate of wet gas	scfh	1,704,937	1,695,175	1,696,107	**1,698,740**
Q_{sd}	Vol. Flow rate of dry gas	dscfm	28,114	27,997	27,807	**27,973**
T_s	Temperature of stack gas	°F	77	81	82	**80**
% O_2	Percent O2 by volume	percent ($^v/_v$)	20.8	20.7	20.8	**20.8**
Isokinetic Sampling Ratio						
I	Isokinetic sampling ratio	percent	104.9	101.4	102.3	**102.9**
Process Data						
$P_{(product\ input)}$	Product input MSW	ton/batch	19.9	21.2	21.0	**20.7**
$P_{(product\ input)}$	Product input MSW	ton/hr	8.18	8.81	8.59	**8.53**
Acetaldehyde Concentrations NCASI 105.01						
Acetaldehyde	Conc. Of Acetaldehyde in dry stack gas	mg/dscm	0.561	0.960	1.08	**0.867**
		gr/dscf	0.000245	0.000419	0.000472	**0.000379**
Acetaldehyde Mass Rates NCASI 105.01						
Acetaldehyde	Emission rate of Acetaldehyde	lb/hour	0.0590	0.101	0.113	**0.0908**
		lb/ton MSW	0.00722	0.0114	0.0131	**0.0106**
Acrolein Concentrations NCASI 105.01						
Acrolein	Conc. Of Acrolein in dry stack gas	mg/dscm	< 1.46E-03	< 1.66E-03	< 1.55E-03	**< 1.55E-03**
		gr/dscf	< 6.36E-07	< 7.26E-07	< 6.75E-07	**< 6.79E-07**
Acrolein Mass Rates NCASI 105.01						
Acrolein	Emission rate of Acrolein	lb/hour	< 1.53E-04	< 1.74E-04	< 1.61E-04	**< 1.63E-04**
		lb/ton MSW	< 1.87E-05	< 1.98E-05	< 1.87E-05	**< 1.91E-05**
Formaldehyde Concentrations NCASI 105.01						
Formaldehyde	Conc. Of Formaldehyde in dry stack gas	mg/dscm	J 3.42E-03	J 5.26E-03	J 6.72E-03	**J 5.13E-03**
		gr/dscf	J 1.49E-06	J 2.30E-06	J 2.94E-06	**J 2.24E-06**
Formaldehyde Mass Rates NCASI 105.01						
Formaldehyde	Emission rate of Formaldehyde	lb/hour	J 3.60E-04	J 5.52E-04	J 7.00E-04	**J 5.37E-04**
		lb/ton MSW	J 4.40E-05	J 6.26E-05	J 8.16E-05	**J 6.27E-05**

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Test Results

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P_s	Pressure of stack gases	inches Hg	30.14	30.14	30.14	**30.14**
$V_{m(std)}$	Volume of gas sample	dscf	111.62	100.03	107.66	**106.43**
$V_{w(std),meas}$	Meas. volume of water vapor	scf	1.20	0.91	1.79	**1.30**
$B_{ws,meas}$	Measured moisture	dimensionless	0.011	0.009	0.016	**0.012**
$B_{ws,theo}$	Theoretical max. moisture		0.031	0.036	0.036	**0.034**
$B_{ws,act}$	Actual moisture		0.011	0.009	0.016	**0.012**
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	28.84	28.84	28.84	**28.84**
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	28.72	28.74	28.66	**28.71**
v_s	Velocity of stack gas	ft./sec	57.66	57.75	57.85	**57.76**
A_n	Area of nozzle	ft^2	0.000218	0.000218	0.000218	**0.000218**
A_s	Area of stack	ft^2	8.30	8.30	8.30	**8.30**
Gas Stream Flow Rates, Temperature, Oxygen						
Q_a	Vol. Flow rate of actual gas	cfm	28,700	28,747	28,796	**28,748**
Q_w	Vol. Flow rate of wet gas	scfm	28,416	28,253	28,268	**28,312**
Q_w	Vol. Flow rate of wet gas	scfh	1,704,937	1,695,175	1,696,107	**1,698,740**
Q_{sd}	Vol. Flow rate of dry gas	dscfm	28,114	27,997	27,807	**27,973**
T_s	Temperature of stack gas	°F	77	81	82	**80**
% O_2	Percent O2 by volume	percent ($^v/_v$)	20.8	20.7	20.8	**20.8**
Isokinetic Sampling Ratio						
I	Isokinetic sampling ratio	percent	104.9	101.4	102.3	**102.9**
Process Data						
$P_{(product\ input)}$	Product input MSW	ton/batch	19.9	21.2	21.0	**20.7**
$P_{(product\ input)}$	Product input MSW	ton/hr	8.18	8.81	8.59	**8.53**
Propionaldehyde Concentrations NCASI 105.01						
Propionaldehyde	Conc. Of Propionaldehyde in dry stack gas	mg/dscm	J 2.37E-03	J 2.42E-03	J 3.41E-03	**J 2.74E-03**
		gr/dscf	J 1.04E-06	J 1.06E-06	J 1.49E-06	**J 1.19E-06**
Propionaldehyde Mass Rates NCASI 105.01						
Propionaldehyde	Emission rate of Propionaldehyde	lb/hour	J 2.50E-04	J 2.54E-04	J 3.55E-04	**J 2.86E-04**
		lb/ton MSW	J 3.06E-05	J 2.88E-05	J 4.14E-05	**J 3.36E-05**
Total Hydrocarbon Concentrations Method 25A						
c_{THC}	THC concentration (as propane)	ppm	9.23	10.30	9.06	**9.53**
c_{THC}	THC concentration (as propane)	mg/dscm	16.9	18.9	16.6	**17.4**
c_{THC}	THC concentration (as propane)	gr/dscf	0.0074	0.0082	0.0072	**0.0076**
Total Hydrocarbon Mass Rates Method 25A						
E_{THC}	THC emission rate (as propane)	lb/hour	1.78	1.98	1.73	**1.83**
E_{THC}	THC emission rate (as propane)	lb/ton MSW	0.22	0.22	0.20	**0.21**
$E_{THC\ All}$	Allowable THC emission rate	lb/ton MSW	0.40	0.40	0.40	**0.40**
% Allow	% of Allowable	%	54%	56%	50%	**54%**

Advanced Industrial Resources, Inc.

Test Results

GP Toledo AMRS

Toledo, OR

Carbon Bed Outlet

(< or ND) indicates the analyte was a non-detect or below the MDL, results displayed are the result of the the MDL.

(J) indicates the analyte was between the MDL and LOQ, the laboratory can positively identify the analyte as present but value is considered to be an estimate.

		Units	Run 1	Run 2	Run 3	Averages
Test Date			12-Jul-23	12-Jul-23	12-Jul-23	
Start Time			8:45	12:12	15:29	
End Time			11:45	14:32	18:01	
Start Time Monitor Data			8:45	12:12	15:29	
Stop Time Monitor Data			11:14	14:31	18:00	
P_m	Pressure of meter gases	inches Hg	30.23	30.23	30.23	**30.23**
P_s	Pressure of stack gases	inches Hg	30.14	30.14	30.14	**30.14**
$V_{m(std)}$	Volume of gas sample	dscf	111.62	100.03	107.66	**106.43**
$V_{w(std),meas}$	Meas. volume of water vapor	scf	1.20	0.91	1.79	**1.30**
$B_{ws,meas}$	Measured moisture	dimensionless	0.011	0.009	0.016	**0.012**
$B_{ws,theo}$	Theoretical max. moisture		0.031	0.036	0.036	**0.034**
$B_{ws,act}$	Actual moisture		0.011	0.009	0.016	**0.012**
M_d	Mol. Wt. Of gas at DGM	lb./lb.-mole	28.84	28.84	28.84	**28.84**
M_s	Mol. Wt. Of gas at stack	lb./lb.-mole	28.72	28.74	28.66	**28.71**
v_s	Velocity of stack gas	ft./sec	57.66	57.75	57.85	**57.76**
A_n	Area of nozzle	ft^2	0.000218	0.000218	0.000218	**0.000218**
A_s	Area of stack	ft^2	8.30	8.30	8.30	**8.30**
Gas Stream Flow Rates, Temperature, Oxygen						
Q_a	Vol. Flow rate of actual gas	cfm	28,700	28,747	28,796	**28,748**
Q_w	Vol. Flow rate of wet gas	scfm	28,416	28,253	28,268	**28,312**
Q_w	Vol. Flow rate of wet gas	scfh	1,704,937	1,695,175	1,696,107	**1,698,740**
Q_{sd}	Vol. Flow rate of dry gas	dscfm	28,114	27,997	27,807	**27,973**
T_s	Temperature of stack gas	°F	77	81	82	**80**
% O_2	Percent O2 by volume	percent ($^v/_v$)	20.8	20.7	20.8	**20.8**
Isokinetic Sampling Ratio						
I	Isokinetic sampling ratio	percent	104.9	101.4	102.3	**102.9**
Process Data						
$P_{(product\ input)}$	Product input MSW	ton/batch	19.9	21.2	21.0	**20.7**
$P_{(product\ input)}$	Product input MSW	ton/hr	8.18	8.81	8.59	**8.53**
Total VOC Mass Rates = (THC (as propane) + Methanol + Formaldehyde) *Equ. A-1 Attachment 1 of ODEQ Guidance for Evaluating VOC Emissions						
E_{THC}	Emission rate THC (as propane)	lb/hour	1.78	1.98	1.73	**1.83**
$E_{Methanol}$	Emission rate of Methanol	lb/hour	0.07	0.13	0.17	**0.12**
$E_{Formaldehyde}$	Emission rate of Formaldehyde	lb/hour	J 3.60E-04	J 5.52E-04	J 7.00E-04	**J 5.37E-04**
$*E_{Total\ VOC}$	Emission rate of Total VOC	lb/hour	1.85	2.11	1.89	**1.95**
$E_{Total\ VOC}$	Emission rate of Total VOC	lb/ton MSW	0.226	0.239	0.220	**0.228**
$E_{Total\ VOC\ all}$	Allowable mission rate of Total VOC	lb/ton MSW	0.246	0.246	0.246	**0.246**
$E_{Total\ VOC\ all}$	% of Allowable	%	92%	97%	90%	**93%**

APPENDIX B

FIELD DATA REDUCTION

Advanced Industrial Resources, Inc.
Data Reduction Sheet

Client:	GP Toledo AMRS	**Console ID:**	C-009
Location:	Toledo, OR	**Y_m:**	1.013
Source:	Carbon Bed Outlet	**$\Delta H_@$:**	1.554
Test Team:	JS, DK, DW	**C_p:**	0.84
EPA Methods:	1, 2, 3, 4, 25A, NACSI 105.01	**Analyte(s):**	THC, HAPS

		Units	Run 1	Run 2	Run 3
Test Date			12-Jul-23	12-Jul-23	12-Jul-23
Start Time			8:45	12:12	15:29
End Time			11:45	14:32	18:01
Start Time Monitor Data			8:45	12:12	15:29
Stop Time Monitor Data			11:14	14:31	18:00
V_m	**Volume of gas sample**	dcf	108.425	98.778	106.568
M_{lc}	**Mass of liquid collected**	g	25.4	19.4	37.9
Δp	**Velocity head of stack gas**	inches H_2O	1.041	1.037	1.036
$(\Delta p)^{1/2}$	**Square root of velocity head**	(inches H_2O)$^{1/2}$	1.019	1.017	1.017
ΔH	**Pressure differential**	inches H_2O	1.56	1.56	1.55
θ	**Total sampling time**	minutes	144.0	134.0	144.0
D_n	**Diameter of nozzle**	inches	0.200	0.200	0.200
D_s	**Diameter of stack**	inches	39.0	39.0	39.0
T_m	**Temperature of meter**	°R	525	533	535
T_s	**Temperature of stack gas**	°R	537	541	542
P_{bar}	**Barometric pressure**	inches Hg	30.12	30.12	30.12
p_g	**Gauge pressure of stack gas**	inches H_2O	0.30	0.30	0.30
% O_2	**Percent O2 by volume**	percent ($^v/_v$)	20.79	20.72	20.79
% CO_2	**Percent CO2 by volume**	percent ($^v/_v$)	0.03	0.05	0.03
% N_2	**Percent N2 by volume**	percent ($^v/_v$)	79.2	79.2	79.2
P	**Product input MSW**	ton/batch	19.9	21.2	21.0
P	**Product input MSW**	ton/hr	8.2	8.8	8.6
m	**Mass of Methanol**	mg	2.01	3.45	4.85
m	**Mass of Phenol**	mg	J 0.10	J 0.11	0.18
m	**Mass of Acetaldehyde**	mg	1.77	2.72	3.30
m	**Mass of Acrolein**	mg	< 0.0046	< 0.0047	< 0.0047
m	**Mass of Formaldehyde**	mg	J 0.011	J 0.015	J 0.021
m	**Mass of Proionaldehyde**	mg	J 0.008	J 0.007	J 0.010
$c_{THC(Wet)}$	**THC Conc. (C_3H_8,wet)**	ppm_W	9.13	10.21	8.91
$c_{THC(Dry)}$	**THC Conc. (C_3H_8,dry)**	ppm_D[1]	9.23	10.30	9.06

(< or ND) indicates the analyte was a non-detect or below the MDL, results displayed are the MDL.
(J) indicates the analyte was between the MDL and LOQ, the laboratory can positively identify the analyte as present but value is considered to be an estimate.

APPENDIX C

EXAMPLE CALCULATIONS

AND

NOMENCLATURE

Advanced Industrial Resources, Inc.
Sample Calculation Sheet

GP Toledo AMRS, Toledo, OR
Carbon Bed Outlet, Run #1

Area of nozzle:

A_n = 3.1415 x D_n^2 / 4 / 144 in^2/ft^2

A_n = 3.1415 x (0.2) / 4 / 144

A_n = 0.000218 ft^2

Area of stack:

A_s = 3.1415 x D_s^2 / 4 / 144 in^2/ft^2

A_s = 3.1415 x (39) / 4 / 144

A_s = 8.30 ft^2

Absolute pressure of meter gases:

$P_m = P_{bar} + \Delta H / 13.6$

P_m = 30.12 + 1.562 /13.6

P_m = 30.23 inches Hg

Absolute pressure of stack gases:

$P_s = P_{bar} + p_g / 13.6$

P_s = 30.12 + 0.3 / 13.6

P_s = 30.14 inches Hg

Volume of gas sample, standardized:

$V_{m(std)} = V_m \times Y_m (T_{std} / T_m) (P_m / P_{std})$

$V_{m(std)}$ = (108.425) x (1.013) x 17.636 x (30.23/525)

$V_{m(std)}$ = 111.54 dscf

Volume of water vapor in the gas sample, standardized:

$V_{w(std)} = (V_{lc} \times p_w \times R \times T_{std}) / (M_w \times P_{std})$

$V_{w(std)}$ = (25.4) x (0.002201) x (21.85) x (528) / (18 x 29.92)

$V_{w(std)}$ = 1.20 scf

Volume proportion of water in the stack gas stream, measured:

$B_{ws,meas} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$

$B_{ws,meas}$ = (1.2 / (111.54 + 1.2))

$B_{ws,meas}$ = 0.0106

Volume proportion of water in the stack gas stream, theoretical maximum:

$B_{ws,theo}$ = ((0.1805 x EXP((17.27 x Ts -460-32))/(Ts-460+395)))-(((Ps-(0.1805 x EXP((17.27 x Ts -460-32))/(Ts-460+395)))) x 0) / (2800 - (1.3 x Ts-460))))/Ps

$B_{ws,theo}$ = ((0.1805 x EXP((17.27 x 537.25 - 460-32))/(537.25-460+395)) - (((30.1420588235294-(0.1805 x EXP((17.27 x 537.25 - 460-32))/(537.25 - 460+395)))) x 0) / (2800-(1.3 x 537.25-460))))/30.1420588235294

$B_{ws,theo}$ = 0.0310

*Note: Values may not agree exactly with results shown elsewhere in this report due strictly to rounding

Advanced Industrial Resources, Inc.
Sample Calculation Sheet

GP Toledo AMRS, Toledo, OR
Carbon Bed Outlet, Run #1

Volume proportion of water in the stack gas stream:

$B_{ws,act}$= lower of $B_{ws,meas}$ and $B_{ws,theo}$

$B_{ws,act}$= 0.0106

Nitrogen content of gas at the DGM:

$\%N_2$ = 100% - $\%CO_2$ - $\%O_2$ - %CO

$\%N_2$ = 100% - 0.03% - 20.79% - 0%

$\%N_2$ = 79.2 %

Molecular weight of gas at the DGM:

M_d = ((44 x $\%CO_{2)}$ + (32 x $\%O_{2)}$ + (28 x ($\%N_2$ + %CO)))/100%

M_d = ((44 x 0.03) + (32 x 20.79) + (28 (79.2 + 0)))/100%

M_d = 28.84 lb/lb-mole

Molecular weight of gas at the stack:

M_s= M_d (1 - B_{ws}) + M_w x B_{ws}

M_s= (28.84 x (1 - 0.0106)) + (18 x 0.0106)

M_s= 28.73 lb/lb-mole

Velocity of stack gas:

v_s = K_p x C_p $[\Delta p]^{1/2}$ x $[T_s/(P_sM_s)]^{1/2}$

v_s = (85.49 x 0.84 x 1.019 x [537 / (30.14 x 28.73)]^1/2

v_s = 57.66 ft/s

Volumetric flow rate of actual stack gas:

Qa = v_s x A_s x 60 sec/min

Q_a = (57.66) x (8.3) x (60 sec/min)

Q_a = 28715 cfm

Volumetric flow rate of dry stack gas, standardized:

Q_{sd} = (60 sec/min) x (1 - B_{ws}) v_s A_s (T_{std} / T_s) x (P_s/P_{std})

Q_{sd} = (60 sec/min) x (1 - 0.0106) x 57.66 x 8.3 x (528 / 537) x (30.14 / 29.92)

Q_{sd} = 28,114 dscfm

*Note: Values may not agree exactly with results shown elsewhere in this report due strictly to rounding

Advanced Industrial Resources, Inc.
Sample Calculation Sheet

GP Toledo AMRS, Toledo, OR
Carbon Bed Outlet, Run #1

Isokinetic sampling ratio expressed as percentage:

$I = 100\ T_s\ [(K_3 \times M_{lc}) + (Y_m \times V_m \times P_m / T_m)] / (60 \times \theta \times v_s \times P_s \times A_n)$

$I = 100 \times (537) \times ((0.002668 \times 25.4) + (1.013 \times 108.425 \times 30.23 / 525)))/(60 \times 150 \times 57.66 \times 30.14 \times 0.000218)$

I= 104.9 %

Concentration of THC (as C3H8) in dry stack gas, standardized:

c= $c_{ppm} \times M_{analyte} / 24.05$

c= 9.23 x 44 / 24.05

c= **16.9** **mg/dscm**

Emission rate of THC (as C3H8), time basis:

E= $(c_{mg/dscm} \times Q_{sd}$ ((60 min/hr) (2.2046x10^{-6} lb./mg) / (35.32 ft^3 / m^3)

E= 16.89 x 28113.9 x (60 min/hr) (2.2046x10-6 lb./mg) / (35.32 ft3 / m3)

E= **1.78** **lb/hr**

Emission rate of THC (as C3H8), time basis:

E= lb/hr / tons/MSW

E= 1.778 / 8.18

E= **0.217** **lb/ton MSW**

*Note: Values may not agree exactly with results shown elsewhere in this report due strictly to rounding

Advanced Industrial Resources, Inc.
Sample Calculation Sheet

GP Toledo AMRS, Toledo, OR
Carbon Bed Outlet, Run #1

Concentration of Methanol in dry stack gas, standardized:

c= (m / $V_{m(std)}$) (35.32 ft^3 / m^3)

c= (2.008 / 111.54) x 35.32

c= **0.64** **mg/dscm**

Concentration of Methanol in dry stack gas, standardized:

c= (mg/dscm) / (35.32 ft^3 / m^3) / (64.8 mg/gr)

c= (0.635) / 35.32 / 64.8

c= **0.000277** **gr/dscf**

Emission rate of Methanol, time basis:

E= $c_{mg/dscm}$ x Q_{sd} x (60 min/hr) x (2.2046 x 10^{-6} lb/mg) / (35.32 ft^3 / m^3)

E= 0.635 x 28113.9 x 60 x 2.2046 x 10-6 / 35.32

E= **0.067** **lb/hr**

Emission rate of Methanol, time basis:

E= lb/hr / tons/MSW

E= 0.06686 / 8.18

E= **0.0082** **lb/ton MSW**

Concentration of Formaldehyde in dry stack gas, standardized:

c= (m / $V_{m(std)}$) (35.32 ft^3 / m^3)

c= (0.0108 / 111.54) x 35.32

c= **0.0030** **mg/dscm**

Concentration of Formaldehyde in dry stack gas, standardized:

c= (mg/dscm) / (35.32 ft^3 / m^3) / (64.8 mg/gr)

c= (0.003) / 35.32 / 64.8

c= **0.0000015** **gr/dscf**

Emission rate of Formaldehyde, time basis:

E= $c_{mg/dscm}$ x Q_{sd} x (60 min/hr) x (2.2046 x 10^{-6} lb/mg) / (35.32 ft^3 / m^3)

E= 0.003 x 28113.9 x 60 x 2.2046 x 10-6 / 35.32

E= **0.00036** **lb/hr**

Emission rate of Formaldehyde, time basis:

E= lb/hr / tons/MSW

E= 0.00036 / 8.18

E= **0.000044** **lb/ton MSW**

Total VOC Mass Rates:

E= (THC lb/hr + Methanol lb/hr + Formaldehyde lb/hr) / tons/MSW

E= 1.78 + 0.07 + 0.0004 / 8.18

E= **0.226**

*Note: Values may not agree exactly with results shown elsewhere in this report due strictly to rounding

EXAMPLE CALCULATIONS

$A_n = D_n^2 \pi / 4$

$A_s = D_s^2 \pi / 4$

$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$

$c_{analyte} = (m_{analyte} / V_{m(std)})\ (35.31466\ ft^3/m^3)$

$'c_{analyte} = (m_{analyte} / V_{m(std)})\ (0.015432\ gr/mg)$

$c_{analyte} = 'c_{analyte}\ MW_{analyte} / 24.04\ l/mol$

$CC = t_{0.975}\ (S_d / n^{1/2})$

$d = 1/n\ (Sd_i)$

$DE = (E_{Inlet} – E_{Outlet}) / E_{,Inlet}\ x\ 100\%$

$E_{analyte} = (m_{analyte} / V_{m(std)})\ Q_{sd}\ (60\ min/hr)\ (2.2046x10^{-6}\ lb./mg)$

$E_{analyte} = c_{analyte}\ Q_{sd}\ (60\ min/hr)\ (2.2046x10^{-6}\ lb./mg)$

$I = 100\ T_s\ (K_3\ V_{lc} + Y_m\ V_m\ P_m / T_m) / (60\ \theta\ v_s\ P_s\ A_n)$

where $K_3 = 0.002668\ (in.\ Hg\ ft^3) / (mL\ °R)$

$K_I = [(2.0084x10^7\ \Delta H_@)\ A_n\ (1 – B_{ws})]^2\ (M_d / M_s)\ (T_m / T_s)\ (P_s / P_m)$

$M_d = 0.44\ (\%\ CO_2) + 0.32\ (\%\ O_2) + 0.28\ (\%\ N_2 + \%\ CO)$

$M_s = M_d\ (1 – B_{ws}) + M_w\ B_{ws}$

$P = Qsd / F\text{-}Factor\ x\ 60\ x\ (20.9\text{-}O_2) / 20.9$

$P_m = P_{bar} + \Delta H / 13.6$

$P_s = P_{bar} + p_g / 13.6$

$Q_a = (60\ s/min)\ v_s\ A_s$

$Q_{sd} = (60\ s/min)\ (1 - B_{ws})\ v_s\ A_s\ (T_{std} / T_s)\ (P_s / P_{std})$

$RA = [Abs(d) + Abs(CC)]/RM$

$S_d = [(Sd_i^2 – (Sdi)^2/n)/(n\text{-}1)]^{1/2}$

$T_m = t_m + 460°$

$T_s = t_s + 460°$

$V_{m(std)} = 17.636 V_m\ Y_m\ (P_m / T_m)$

$V_{w(std)} = M_{lc}\ x\ 0.04716$

$v_s = K_p\ C_p\ [\Delta p]^{1/2}\ [T_s / (P_s\ M_s)]^{1/2}$

NOMENCLATURE

Symbol	Units	Description
Abs(x)	dimensionless	Absolute value of parameter x
A_n	ft^2	Area of the nozzle
A_s	ft^2	Area of the stack
B_{ws}	dimensionless	Volume proportion of water in the stack gas stream
C_p	dimensionless	Type S pitot tube coefficient
$c_{analyte}$	mg/dscm	Concentration of analyte in dry stack gas, standardized
$'c_{analyte}$	gr./dscf	Concentration of analyte in dry stack gas, standardized
$'c_{analyte}$	ppm	Concentration of analyte in dry stack gas, standardized
CC	dimensionless	One-tailed 2.5% error confidence coefficient
d	ppm	Arithmetic mean of differences
d_i	ppm	Difference between individual CEM and reference method concentration value
D_n	inches	Internal diameter of the nozzle at the entrance orifice
D_s	inches	Internal diameter of the stack at sampling location
DE	percent	Destruction efficiency
ΔH	inches H_2O	Average pressure differential across the meter orifice
$\Delta H_@$	inches H_2O	Orifice pressure differential that corresponds to 0.75 cfm of air at 68 °F and 29.92 inches of Hg
Δp	inches H_2O	Velocity head of stack gas
$E_{analyte}$	lb./hour	Emission rate of analyte, time basis
I	percent	Isokinetic sampling ratio expressed as percentage
K_I	dimensionless	K-factor, ratio of DH to DP, ideal
K_p	$ft[(lb/lb\text{-}mol)(in.\ Hg)]^{1/2}$	Type S pitot tube constant,
	$s[(°R)(in.\ H_2O)]^{1/2}$	= 85.49
L_p	cfm	Measured post-test leakage rate of the sampling train
M_d	lb./lb.-mole	Molecular weight of gas at the DGM
M_s	lb./lb.-mole	Molecular weight of gas at the stack

NOMENCLATURE

Symbol	Units	Description
M_w	lb./lb.-mole	Molecular weight of water,
		= 18.0
$m_{analyte}$	mg	Mass of analyte in the sample
n	dimensionless	Number of data points
P	MMBtu	Fuel firing rate
P_{bar}	inches Hg	Barometric pressure at measurement site
P_{input}	tons/hour	Process dry mass input rate
p_g	inches H_2O	Gauge (static) pressure of stack gas
P_m	inches Hg	Absolute pressure of meter gases
P_s	inches Hg	Absolute pressure of stack gases
P_{std}	inches Hg	Standard absolute pressure
		= 29.92
Q_a	cfm	Volumetric flow rate of actual stack gas
Q_{sd}	dscfm	Volumetric flow rate of dry stack gas, standardized
R	(in. Hg)(ft^3)	Ideal gas constant,
	(lb-mole)(°R)	= 21.85
RA	percent	Relative accuracy
RE	percent	Removal efficiency
RM	ppm	Average reference method concentration
r_w	lb/mL	Density of water,
		= 0.002201
r_a	g/mL	Density of acetone,
		= 0.7899
S_d	dimensionless	Standard deviation
T_m	°R	Absolute temperature of dry gas meter
T_s	°R	Absolute temperature of stack gas
T_{std}	°R	Standard absolute temperature,
		= 528
$t_{0.975}$	dimensionless	2.5 percent error t-value
t_m	°F	Temperature of DGM
t_s	°F	Temperature of stack gas
θ	minutes	Total sampling time

NOMENCLATURE

Symbol	Units	Description
M_{lc}	g	Total mass of liquid collected
V_m	dcf	Volume of gas sample as measured by the DGM
$V_{m(std)}$	dscf	Volume of gas sample as measured by the DGM, standardized
$V_{w(std)}$	scf	Volume of water vapor in the gas sample, standardized
v_s	ft./sec	Velocity of stack gas
Y_m	dimensionless	DGM calibration coefficient
Y_c	dimensionless	DGM calibration check value
Y_w	dimensionless	Reference (wet) gas meter calibration coefficient
% CO_2	percent	Percent CO_2 by volume, dry basis
% O_2	percent	Percent O_2 by volume, dry basis
% N_2	percent	Percent N_2 by volume, dry basis

APPENDIX D

FIELD DATA

Carbon Bed I/O

Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 6:30	20.63	0.02	2.38	6.23	
7/12/2023 6:31	20.01	12.36	2.29	6.22	
7/12/2023 6:32	20.00	17.99	2.18	6.19	
7/12/2023 6:33	20.01	17.99	2.16	6.09	
7/12/2023 6:34	19.67	17.99	2.20	6.04	
7/12/2023 6:35	0.00	0.90	2.14	6.02	
7/12/2023 6:36	0.00	0.00	2.06	5.96	
7/12/2023 6:37	0.00	0.00	2.03	5.90	
7/12/2023 6:38	0.00	0.00	1.97	5.85	
7/12/2023 6:39	4.21	6.41	1.88	5.78	
7/12/2023 6:40	11.00	9.00	1.96	5.76	
7/12/2023 6:41	11.00	9.00	2.70	5.74	
7/12/2023 6:42	11.00	9.00	2.03	5.70	
7/12/2023 6:43	0.21	0.60	1.87	5.67	
7/12/2023 6:44	5.90	0.00	2.31	5.63	
7/12/2023 6:45	1.41	0.02	2.76	5.58	
7/12/2023 6:46	0.02	0.02	3.69	5.54	
7/12/2023 6:47	0.02	0.02	1.53	5.50	
7/12/2023 6:48	0.76	0.02	0.94	5.48	
7/12/2023 6:49	11.02	8.45	0.67	5.44	
7/12/2023 6:50	11.02	8.90	0.51	5.41	
7/12/2023 6:51	11.02	8.89	0.47	5.39	
7/12/2023 6:52	11.02	8.90	0.45	5.37	
7/12/2023 6:53	11.02	8.90	0.44	5.35	
7/12/2023 6:54	11.02	8.90	0.88	5.34	
7/12/2023 6:55	11.97	8.01	-0.82	5.35	
7/12/2023 6:56	20.56	0.00	0.03	5.33	
7/12/2023 6:57	20.55	0.00	0.05	5.32	
7/12/2023 6:58	20.08	0.00	36.36	5.32	
7/12/2023 6:59	17.09	0.00	94.79	5.32	
7/12/2023 7:00	16.91	0.00	95.03	5.31	
7/12/2023 7:01	16.91	0.00	95.01	5.32	
7/12/2023 7:02	16.92	0.00	87.09	5.31	
7/12/2023 7:03	18.34	0.00	51.84	5.28	
7/12/2023 7:04	18.39	0.00	49.95	5.23	
7/12/2023 7:05	18.39	0.00	50.02	5.20	
7/12/2023 7:06	18.40	0.00	45.16	5.17	
7/12/2023 7:07	19.05	0.00	35.48	5.13	
7/12/2023 7:08	18.97	0.00	34.98	5.12	
7/12/2023 7:09	18.97	0.00	34.96	5.10	
7/12/2023 7:10	19.06	0.00	23.42	5.08	
7/12/2023 7:11	20.68	0.00	5.25	6.56	
7/12/2023 7:12	20.78	0.01	5.07	4.51	
7/12/2023 7:13	20.77	0.01	5.11	4.28	
7/12/2023 7:14	20.77	0.01	5.13	3.16	
7/12/2023 7:15	20.77	0.02	5.14	0.01	
7/12/2023 7:16	20.77	0.01	5.14	-0.03	
7/12/2023 7:17	20.77	0.01	5.13	-0.04	
7/12/2023 7:18	20.77	0.01	5.11	-0.06	
7/12/2023 7:19	20.77	0.01	5.11	78.20	
7/12/2023 7:20	20.77	0.01	5.11	95.10	
7/12/2023 7:21	20.77	0.01	5.09	95.15	
7/12/2023 7:22	20.77	0.01	5.09	95.05	
7/12/2023 7:23	20.78	0.01	5.06	94.84	
7/12/2023 7:24	20.78	0.01	5.06	94.72	
7/12/2023 7:25	20.78	0.01	5.06	83.09	
7/12/2023 7:26	20.78	0.01	5.06	51.31	
7/12/2023 7:27	20.78	0.01	5.04	50.04	
7/12/2023 7:28	20.79	0.01	5.03	50.02	
7/12/2023 7:29	20.79	0.01	5.03	50.07	
7/12/2023 7:30	20.79	0.01	5.02	35.01	
7/12/2023 7:31	20.79	0.01	5.01	35.25	
7/12/2023 7:32	20.80	0.01	5.00	35.23	
7/12/2023 7:33	20.80	0.01	5.00	35.09	
7/12/2023 7:34	20.79	0.01	5.01	17.79	
7/12/2023 7:35	20.11	15.24	5.02	10.83	
7/12/2023 7:36	20.09	17.98	5.00	1.23	
7/12/2023 7:37	20.08	17.99	5.00	0.73	
7/12/2023 7:38	20.81	14.21	5.00	0.65	
7/12/2023 7:39	20.82	0.02	5.00	0.66	
7/12/2023 7:40	20.81	0.01	5.01	0.67	
7/12/2023 7:41	20.82	0.02	5.00	0.64	
7/12/2023 7:42	20.82	0.01	4.99	0.64	
7/12/2023 7:43	20.83	0.02	4.97	0.64	
7/12/2023 7:44	20.83	0.01	4.97	0.63	
7/12/2023 7:45	20.83	0.01	4.97	0.62	

Carbon Bed I/O

Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 7:46	20.83	0.01	4.97	0.63	
7/12/2023 7:47	20.83	0.01	4.99	0.66	
7/12/2023 7:48	20.84	0.01	4.99	0.67	
7/12/2023 7:49	20.84	0.01	4.97	0.67	
7/12/2023 7:50	20.84	0.01	4.94	0.66	
7/12/2023 7:51	20.85	0.01	4.93	0.64	
7/12/2023 7:52	20.85	0.01	4.91	0.63	
7/12/2023 7:53	20.84	0.01	4.91	0.58	
7/12/2023 7:54	20.85	0.01	4.90	0.58	
7/12/2023 7:55	20.84	0.01	4.88	0.57	
7/12/2023 7:56	20.84	0.01	4.86	0.55	
7/12/2023 7:57	20.84	0.01	4.85	0.55	
7/12/2023 7:58	20.85	0.01	4.83	0.54	
7/12/2023 7:59	20.85	0.01	4.81	0.51	
7/12/2023 8:00	20.84	0.01	4.82	0.51	
7/12/2023 8:01	20.84	0.01	4.82	0.52	
7/12/2023 8:02	20.85	0.01	4.84	0.51	
7/12/2023 8:03	20.85	0.01	4.83	0.50	
7/12/2023 8:04	20.85	0.01	4.82	0.50	
7/12/2023 8:05	20.85	0.01	4.83	0.49	
7/12/2023 8:06	20.84	0.01	4.82	0.49	
7/12/2023 8:07	20.85	0.01	4.82	0.47	
7/12/2023 8:08	20.85	0.02	4.82	0.49	
7/12/2023 8:09	20.85	0.02	4.81	0.47	
7/12/2023 8:10	20.85	0.01	4.82	0.46	
7/12/2023 8:11	20.85	0.01	4.82	0.45	
7/12/2023 8:12	20.85	0.01	4.81	0.45	
7/12/2023 8:13	20.85	0.01	4.80	0.46	
7/12/2023 8:14	20.85	0.01	4.78	0.45	
7/12/2023 8:15	20.85	0.01	4.78	0.46	
7/12/2023 8:16	20.85	0.01	4.79	0.47	
7/12/2023 8:17	20.85	0.01	4.80	0.47	
7/12/2023 8:18	20.86	0.01	4.80	0.47	
7/12/2023 8:19	20.86	0.01	4.80	0.49	
7/12/2023 8:20	20.86	0.01	4.81	0.48	
7/12/2023 8:21	20.85	0.01	4.81	0.49	
7/12/2023 8:22	20.85	0.01	4.83	0.49	
7/12/2023 8:23	20.86	0.01	4.82	0.49	
7/12/2023 8:24	20.86	0.01	4.80	0.49	
7/12/2023 8:25	20.86	0.01	4.80	0.49	
7/12/2023 8:26	20.85	0.01	4.82	0.51	
7/12/2023 8:27	20.85	0.01	4.83	0.52	
7/12/2023 8:28	20.86	0.01	4.84	0.53	
7/12/2023 8:29	20.86	0.01	4.85	0.54	
7/12/2023 8:30	20.85	0.01	4.85	0.55	
7/12/2023 8:31	20.85	0.01	4.85	0.55	
7/12/2023 8:32	20.85	0.01	4.83	0.53	
7/12/2023 8:33	20.85	0.01	4.83	0.53	
7/12/2023 8:34	20.86	0.01	4.82	0.53	
7/12/2023 8:35	20.86	0.01	4.82	0.46	
7/12/2023 8:36	20.85	0.01	4.80	0.44	
7/12/2023 8:37	20.85	0.01	4.80	0.45	
7/12/2023 8:38	20.85	0.01	4.82	0.49	
7/12/2023 8:39	20.85	0.01	4.83	0.52	
7/12/2023 8:40	20.85	0.01	4.83	0.53	
7/12/2023 8:41	20.85	0.01	4.83	0.53	
7/12/2023 8:42	20.85	0.01	4.86	0.53	
7/12/2023 8:43	20.85	0.01	4.87	0.53	
7/12/2023 8:44	20.85	0.01	4.88	0.52	
Run 1 Start					
7/12/2023 8:45	20.86	0.01	4.89	0.53	-831%
7/12/2023 8:46	20.85	0.01	4.91	0.54	-814%
7/12/2023 8:47	20.85	0.01	4.91	0.55	-798%
7/12/2023 8:48	20.85	0.01	4.91	0.55	-796%
7/12/2023 8:49	20.85	0.01	4.92	0.62	-698%
7/12/2023 8:50	20.85	0.01	4.95	0.88	-465%
7/12/2023 8:51	20.85	0.01	4.99	1.35	-270%
7/12/2023 8:52	20.84	0.02	5.02	2.92	-72%
7/12/2023 8:53	20.84	0.03	5.07	4.59	-10%
7/12/2023 8:54	20.84	0.04	5.10	4.79	-6%
7/12/2023 8:55	20.83	0.04	5.14	3.82	-34%
7/12/2023 8:56	20.83	0.05	5.17	4.25	-22%
7/12/2023 8:57	20.84	0.06	5.18	3.17	-64%
7/12/2023 8:58	20.84	0.06	5.20	3.32	-56%
7/12/2023 8:59	20.85	0.05	5.33	2.95	-81%
7/12/2023 9:00	20.82	0.06	5.42	74.07	93%

Carbon Bed I/O

Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 9:01	20.82	0.08	5.85	42.11	86%
7/12/2023 9:02	20.81	0.09	5.54	29.59	81%
7/12/2023 9:03	20.85	0.11	5.21	7.75	33%
7/12/2023 9:04	20.86	0.06	5.15	5.02	-3%
7/12/2023 9:05	20.86	0.04	5.11	4.42	-16%
7/12/2023 9:06	20.86	0.03	5.08	4.20	-21%
7/12/2023 9:07	20.86	0.02	5.06	4.15	-22%
7/12/2023 9:08	20.86	0.02	5.06	4.15	-22%
7/12/2023 9:09	20.86	0.02	5.07	4.17	-22%
7/12/2023 9:10	20.86	0.02	5.07	4.17	-22%
7/12/2023 9:11	20.87	0.02	5.09	4.12	-23%
7/12/2023 9:12	20.86	0.01	5.10	4.05	-26%
7/12/2023 9:13	20.86	0.01	5.13	3.95	-30%
7/12/2023 9:14	20.87	0.01	5.15	3.84	-34%
7/12/2023 9:15	20.86	0.02	5.17	3.71	-39%
7/12/2023 9:16	20.86	0.02	5.17	3.58	-44%
7/12/2023 9:17	20.86	0.01	5.19	3.46	-50%
7/12/2023 9:18	20.86	0.01	5.21	3.34	-56%
7/12/2023 9:19	20.86	0.01	5.23	3.19	-64%
7/12/2023 9:20	20.86	0.01	5.25	3.10	-69%
7/12/2023 9:21	20.85	0.01	5.26	3.03	-74%
7/12/2023 9:22	20.86	0.01	5.29	2.95	-79%
7/12/2023 9:23	20.85	0.01	5.31	2.89	-84%
7/12/2023 9:24	20.85	0.01	5.34	2.83	-89%
7/12/2023 9:25	20.85	0.01	5.35	2.77	-93%
7/12/2023 9:26	20.85	0.01	5.36	2.73	-97%
7/12/2023 9:27	20.85	0.01	5.38	2.69	-100%
7/12/2023 9:28	20.84	0.01	5.41	2.65	-104%
7/12/2023 9:29	20.85	0.01	5.44	2.62	-108%
7/12/2023 9:30	20.85	0.01	5.48	2.59	-111%
7/12/2023 9:31	20.85	0.01	5.50	2.56	-115%
7/12/2023 9:32	20.85	0.01	5.52	2.54	-118%
7/12/2023 9:33	20.85	0.01	5.52	2.51	-120%
7/12/2023 9:34	20.85	0.01	5.54	2.48	-124%
7/12/2023 9:35	20.85	0.01	5.56	2.45	-127%
7/12/2023 9:36	20.86	0.01	5.58	2.43	-130%
7/12/2023 9:37	20.85	0.01	5.61	2.43	-131%
7/12/2023 9:38	20.85	0.02	5.61	2.45	-130%
7/12/2023 9:39	20.85	0.02	5.65	2.47	-129%
7/12/2023 9:40	20.85	0.01	5.68	2.48	-129%
7/12/2023 9:41	20.85	0.01	5.70	2.49	-129%
7/12/2023 9:42	20.86	0.01	5.71	2.51	-128%
7/12/2023 9:43	20.85	0.01	5.73	2.52	-128%
7/12/2023 9:44	20.85	0.01	5.73	2.51	-128%
7/12/2023 9:45	20.85	0.01	5.75	2.49	-131%
7/12/2023 9:46	20.85	0.01	5.76	2.46	-134%
7/12/2023 9:47	20.85	0.01	5.76	2.44	-136%
7/12/2023 9:48	20.85	0.01	5.75	2.41	-138%
7/12/2023 9:49	20.85	0.01	5.74	2.40	-140%
7/12/2023 9:50	20.85	0.01	5.74	2.37	-142%
7/12/2023 9:51	20.85	0.01	5.73	2.35	-144%
7/12/2023 9:52	20.85	0.01	5.73	2.32	-147%
7/12/2023 9:53	20.85	0.01	5.76	2.32	-149%
7/12/2023 9:54	20.85	0.01	5.78	2.34	-148%
7/12/2023 9:55	20.85	0.02	5.79	2.34	-147%
7/12/2023 9:56	20.85	0.01	5.80	2.31	-151%
7/12/2023 9:57	20.85	0.01	5.82	2.31	-151%
7/12/2023 9:58	20.85	0.01	5.85	2.31	-153%
7/12/2023 9:59	20.85	0.01	5.85	2.29	-156%
7/12/2023 10:00	20.85	0.01	5.87	2.28	-157%
7/12/2023 10:01	20.85	0.01	5.90	2.31	-156%
7/12/2023 10:02	20.85	0.01	5.91	2.30	-157%
7/12/2023 10:03	20.85	0.01	5.92	2.29	-159%
7/12/2023 10:04	20.84	0.01	5.94	2.28	-160%
7/12/2023 10:05	20.85	0.02	5.98	2.28	-162%
7/12/2023 10:06	20.85	0.02	5.99	2.28	-163%
7/12/2023 10:07	20.85	0.01	6.01	2.29	-162%
7/12/2023 10:08	20.85	0.01	6.03	2.31	-161%
7/12/2023 10:09	20.85	0.01	6.06	2.34	-159%
7/12/2023 10:10	20.85	0.01	6.08	2.37	-157%
7/12/2023 10:11	20.84	0.01	6.11	2.37	-158%
7/12/2023 10:12	20.85	0.01	6.12	2.39	-156%
7/12/2023 10:13	20.83	0.01	6.55	10.27	36%
7/12/2023 10:14	20.58	0.09	8.58	91.64	91%
7/12/2023 10:15	20.69	0.61	9.02	91.41	90%
7/12/2023 10:16	20.80	0.49	8.62	32.46	73%

Carbon Bed I/O Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 10:17	20.82	0.20	8.22	14.33	43%
7/12/2023 10:18	20.83	0.10	7.92	9.27	15%
7/12/2023 10:19	20.84	0.07	7.68	6.02	-28%
7/12/2023 10:20	20.83	0.05	7.50	4.54	-65%
7/12/2023 10:21	20.84	0.04	7.36	4.50	-63%
7/12/2023 10:22	20.84	0.04	7.22	4.76	-52%
7/12/2023 10:23	20.84	0.03	7.11	4.77	-49%
7/12/2023 10:24	20.84	0.03	7.03	4.44	-58%
7/12/2023 10:25	20.84	0.02	6.96	4.09	-70%
7/12/2023 10:26	20.84	0.02	6.89	2.94	-134%
7/12/2023 10:27	20.84	0.02	6.91	2.76	-151%
7/12/2023 10:28	20.84	0.02	6.94	2.79	-149%
7/12/2023 10:29	20.84	0.02	6.91	2.78	-149%
7/12/2023 10:30	20.84	0.02	6.86	2.70	-154%
7/12/2023 10:31	20.82	0.02	6.90	16.92	59%
7/12/2023 10:32	20.82	0.04	6.94	11.70	41%
7/12/2023 10:33	20.82	0.04	7.28	11.22	35%
7/12/2023 10:34	20.82	0.04	8.43	11.46	26%
7/12/2023 10:35	20.82	0.04	10.66	13.81	23%
7/12/2023 10:36	20.82	0.05	12.41	17.89	31%
7/12/2023 10:37	20.82	0.06	13.25	19.63	33%
7/12/2023 10:38	20.82	0.07	14.12	20.04	30%
7/12/2023 10:39	20.82	0.08	14.94	19.87	25%
7/12/2023 10:40	20.81	0.08	15.67	19.79	21%
7/12/2023 10:41	20.81	0.08	16.42	18.59	12%
7/12/2023 10:42	20.81	0.08	17.00	17.32	2%
7/12/2023 10:43	20.82	0.08	17.33	17.43	1%
7/12/2023 10:44	20.82	0.08	17.66	17.72	0%
7/12/2023 10:45	20.81	0.08	17.96	18.21	1%
7/12/2023 10:46	20.81	0.08	18.12	18.78	4%
7/12/2023 10:47	20.81	0.07	18.23	19.30	6%
7/12/2023 10:48	20.82	0.07	18.38	20.11	9%
7/12/2023 10:49	20.81	0.07	18.48	21.17	13%
7/12/2023 10:50	20.81	0.07	18.55	22.06	16%
7/12/2023 10:51	20.81	0.07	18.61	22.50	17%
7/12/2023 10:52	20.81	0.07	18.74	23.27	19%
7/12/2023 10:53	20.81	0.07	18.75	23.91	22%
7/12/2023 10:54	20.80	0.07	18.86	26.89	30%
7/12/2023 10:55	20.80	0.07	18.92	26.85	30%
7/12/2023 10:56	20.80	0.07	19.07	25.69	26%
7/12/2023 10:57	20.80	0.07	19.02	25.58	26%
7/12/2023 10:58	20.80	0.07	18.96	36.05	47%
7/12/2023 10:59	20.80	0.07	18.93	40.33	53%
7/12/2023 11:00	20.79	0.07	18.92	28.51	34%
7/12/2023 11:01	20.79	0.07	19.06	28.36	33%
7/12/2023 11:02	20.79	0.07	19.22	28.83	33%
7/12/2023 11:03	20.79	0.07	19.37	29.27	34%
7/12/2023 11:04	20.79	0.07	19.55	29.72	34%
7/12/2023 11:05	20.79	0.07	19.75	30.05	34%
7/12/2023 11:06	20.79	0.07	19.92	30.20	34%
7/12/2023 11:07	20.79	0.07	20.05	30.31	34%
7/12/2023 11:08	20.79	0.07	20.02	30.10	33%
7/12/2023 11:09	20.79	0.07	20.03	29.85	33%
7/12/2023 11:10	20.78	0.07	20.07	29.66	32%
7/12/2023 11:11	20.78	0.07	20.00	29.47	32%
7/12/2023 11:12	20.77	0.07	19.78	29.28	32%
7/12/2023 11:13	20.77	0.07	19.56	28.82	32%
7/12/2023 11:14	20.76	0.07	19.43	28.25	31%
Run 1 Avg	**20.83**	**0.04**	**9.13**	**11.50**	21%
7/12/2023 11:15	20.76	0.06	18.94	27.79	
7/12/2023 11:16	20.76	0.06	18.28	28.29	
7/12/2023 11:17	20.75	0.05	17.66	24.62	
7/12/2023 11:18	20.75	0.04	16.56	24.03	
7/12/2023 11:19	20.75	0.04	15.47	23.90	
7/12/2023 11:20	20.75	0.04	14.55	23.76	
7/12/2023 11:21	20.75	0.04	13.63	23.80	
7/12/2023 11:22	20.75	0.04	12.99	23.70	
7/12/2023 11:23	20.75	0.04	12.67	23.60	
7/12/2023 11:24	14.88	0.02	12.56	27.58	
7/12/2023 11:25	0.02	0.00	12.52	39.53	
7/12/2023 11:26	0.03	0.00	12.15	55.64	
7/12/2023 11:27	2.36	1.18	11.68	63.53	
7/12/2023 11:28	20.01	17.73	11.21	65.80	
7/12/2023 11:29	20.01	17.73	10.80	70.05	
7/12/2023 11:30	20.01	17.73	10.44	72.21	

Carbon Bed I/O Time	O2 %	CO2 %	VOC Out ppm	VOC In ppm	Destruction Eff. %
7/12/2023 11:31	11.45	10.41	10.14	75.52	
7/12/2023 11:32	11.00	8.95	9.91	89.98	
7/12/2023 11:33	11.00	8.95	9.72	97.52	
7/12/2023 11:34	18.49	2.10	9.55	97.52	
7/12/2023 11:35	20.77	0.02	9.40	97.52	
7/12/2023 11:36	20.77	0.02	9.25	49.26	
7/12/2023 11:37	20.77	0.01	9.11	18.67	
7/12/2023 11:38	20.77	0.02	9.16	20.44	
7/12/2023 11:39	20.64	0.01	7.83	20.11	
7/12/2023 11:40	20.54	0.00	5.68	11.87	
7/12/2023 11:41	20.54	0.00	3.39	0.71	
7/12/2023 11:42	20.54	0.00	2.74	0.79	
7/12/2023 11:43	20.60	0.00	2.61	0.91	
7/12/2023 11:44	20.77	0.00	1.07	0.82	
7/12/2023 11:45	20.78	0.01	0.00	0.74	
7/12/2023 11:46	20.78	0.01	-0.02	0.69	
7/12/2023 11:47	20.77	0.01	-0.01	0.67	
7/12/2023 11:48	20.77	0.01	25.38	0.67	
7/12/2023 11:49	20.77	0.01	34.97	0.65	
7/12/2023 11:50	20.78	0.01	35.10	0.13	
7/12/2023 11:51	20.78	0.01	34.98	-0.02	
7/12/2023 11:52	20.77	0.01	34.91	0.01	
7/12/2023 11:53	20.77	0.01	18.24	0.08	
7/12/2023 11:54	20.77	0.01	2.05	0.08	
7/12/2023 11:55	20.77	0.01	1.90	0.05	
7/12/2023 11:56	20.77	0.01	2.17	0.09	
7/12/2023 11:57	20.77	0.02	5.33	0.21	
7/12/2023 11:58	20.78	0.02	5.93	0.20	
7/12/2023 11:59	20.79	0.02	5.99	0.29	
7/12/2023 12:00	20.79	0.02	6.05	0.15	
7/12/2023 12:01	20.79	0.02	6.17	7.70	
7/12/2023 12:02	20.79	0.02	6.35	35.39	
7/12/2023 12:03	20.79	0.02	6.42	35.39	
7/12/2023 12:04	20.79	0.02	6.49	35.38	
7/12/2023 12:05	20.79	0.01	6.57	28.61	
7/12/2023 12:06	20.78	0.01	6.62	24.95	
7/12/2023 12:07	20.78	0.01	6.67	4.10	
7/12/2023 12:08	20.78	0.02	6.72	1.84	
7/12/2023 12:09	20.78	0.02	6.79	1.75	
7/12/2023 12:10	20.78	0.02	6.86	1.59	
7/12/2023 12:11	20.77	0.01	6.94	1.75	
Run 2 Start					
7/12/2023 12:12	20.76	0.02	7.07	5.03	-41%
7/12/2023 12:13	20.75	0.02	7.30	8.70	16%
7/12/2023 12:14	20.74	0.02	7.57	21.37	65%
7/12/2023 12:15	20.73	0.03	7.80	27.17	71%
7/12/2023 12:16	20.72	0.04	7.96	28.04	72%
7/12/2023 12:17	20.72	0.05	8.09	25.16	68%
7/12/2023 12:18	20.71	0.06	8.19	26.57	69%
7/12/2023 12:19	20.72	0.07	8.26	19.96	59%
7/12/2023 12:20	20.72	0.07	8.31	21.41	61%
7/12/2023 12:21	20.73	0.06	8.39	18.28	54%
7/12/2023 12:22	20.72	0.06	8.48	22.32	62%
7/12/2023 12:23	20.72	0.05	8.60	12.74	33%
7/12/2023 12:24	20.69	0.05	8.86	72.84	88%
7/12/2023 12:25	20.70	0.08	9.10	45.98	80%
7/12/2023 12:26	20.70	0.08	8.74	30.41	71%
7/12/2023 12:27	20.73	0.09	7.96	4.68	-70%
7/12/2023 12:28	20.73	0.06	7.55	2.38	-218%
7/12/2023 12:29	20.73	0.04	7.31	1.95	-275%
7/12/2023 12:30	20.73	0.03	7.16	1.73	-314%
7/12/2023 12:31	20.73	0.02	7.02	1.58	-343%
7/12/2023 12:32	20.73	0.02	6.92	1.49	-364%
7/12/2023 12:33	20.73	0.02	6.82	1.42	-380%
7/12/2023 12:34	20.72	0.02	6.76	1.37	-394%
7/12/2023 12:35	20.73	0.02	6.66	1.33	-401%
7/12/2023 12:36	20.72	0.02	6.63	1.31	-406%
7/12/2023 12:37	20.73	0.02	6.58	1.29	-412%
7/12/2023 12:38	20.73	0.01	6.54	1.25	-422%
7/12/2023 12:39	20.73	0.01	6.49	1.23	-429%
7/12/2023 12:40	20.72	0.02	6.47	1.20	-439%
7/12/2023 12:41	20.73	0.01	6.43	1.19	-440%
7/12/2023 12:42	20.73	0.02	6.40	1.21	-430%
7/12/2023 12:43	20.72	0.01	6.37	1.20	-430%
7/12/2023 12:44	20.73	0.01	6.36	1.23	-419%
7/12/2023 12:45	20.73	0.02	6.31	1.23	-415%

Carbon Bed I/O Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 12:46	20.72	0.02	6.31	1.24	-409%
7/12/2023 12:47	20.72	0.01	6.33	1.25	-405%
7/12/2023 12:48	20.73	0.02	6.34	1.29	-392%
7/12/2023 12:49	20.72	0.02	6.34	1.32	-381%
7/12/2023 12:50	20.72	0.02	6.36	1.34	-373%
7/12/2023 12:51	20.72	0.01	6.38	1.30	-391%
7/12/2023 12:52	20.72	0.02	6.40	1.36	-372%
7/12/2023 12:53	20.72	0.02	6.41	1.39	-361%
7/12/2023 12:54	20.72	0.02	6.44	1.43	-352%
7/12/2023 12:55	20.72	0.02	6.49	1.53	-325%
7/12/2023 12:56	20.72	0.02	6.54	1.56	-319%
7/12/2023 12:57	20.72	0.02	6.57	1.52	-333%
7/12/2023 12:58	20.73	0.02	6.55	1.48	-342%
7/12/2023 12:59	20.72	0.02	6.55	1.48	-341%
7/12/2023 13:00	20.72	0.02	6.55	1.47	-344%
7/12/2023 13:01	20.72	0.02	6.55	1.49	-340%
7/12/2023 13:02	20.72	0.02	6.53	1.49	-339%
7/12/2023 13:03	20.72	0.02	6.50	1.51	-330%
7/12/2023 13:04	20.72	0.02	6.49	1.51	-330%
7/12/2023 13:05	20.72	0.02	6.48	1.52	-325%
7/12/2023 13:06	20.72	0.02	6.45	1.53	-321%
7/12/2023 13:07	20.72	0.02	6.42	1.54	-318%
7/12/2023 13:08	20.72	0.02	6.41	1.56	-311%
7/12/2023 13:09	20.72	0.02	6.39	1.56	-310%
7/12/2023 13:10	20.72	0.02	6.35	1.54	-313%
7/12/2023 13:11	20.72	0.02	6.32	1.55	-307%
7/12/2023 13:12	20.72	0.01	6.33	1.56	-307%
7/12/2023 13:13	20.72	0.01	6.34	1.55	-310%
7/12/2023 13:14	20.72	0.02	6.34	1.54	-310%
7/12/2023 13:15	20.71	0.02	6.34	1.55	-310%
7/12/2023 13:16	20.72	0.02	6.31	1.55	-307%
7/12/2023 13:17	20.72	0.02	6.31	1.57	-302%
7/12/2023 13:18	20.73	0.02	6.31	1.62	-291%
7/12/2023 13:19	20.72	0.02	6.31	1.65	-283%
7/12/2023 13:20	20.72	0.02	6.28	1.64	-283%
7/12/2023 13:21	20.72	0.02	6.26	1.64	-282%
7/12/2023 13:22	20.72	0.02	6.25	1.68	-272%
7/12/2023 13:23	20.72	0.02	6.25	1.67	-275%
7/12/2023 13:24	20.72	0.02	6.25	1.67	-274%
7/12/2023 13:25	20.72	0.02	6.25	1.71	-266%
7/12/2023 13:26	20.72	0.02	6.23	1.72	-263%
7/12/2023 13:27	20.72	0.02	6.22	1.74	-257%
7/12/2023 13:28	20.73	0.02	6.25	1.72	-263%
7/12/2023 13:29	20.73	0.02	6.23	1.76	-254%
7/12/2023 13:30	20.73	0.02	6.22	1.79	-248%
7/12/2023 13:31	20.73	0.02	6.22	1.81	-243%
7/12/2023 13:32	20.73	0.01	6.22	1.84	-239%
7/12/2023 13:33	20.74	0.02	6.24	1.87	-233%
7/12/2023 13:34	20.74	0.02	6.25	1.85	-239%
7/12/2023 13:35	20.74	0.02	6.25	1.94	-222%
7/12/2023 13:36	20.73	0.02	6.78	29.43	77%
7/12/2023 13:37	20.49	0.10	8.45	95.44	91%
7/12/2023 13:38	20.61	0.60	8.55	75.27	89%
7/12/2023 13:39	20.71	0.45	8.27	18.79	56%
7/12/2023 13:40	20.74	0.17	8.06	9.84	18%
7/12/2023 13:41	20.75	0.10	7.88	5.76	-37%
7/12/2023 13:42	20.75	0.07	7.70	2.98	-158%
7/12/2023 13:43	20.76	0.05	7.57	2.01	-277%
7/12/2023 13:44	20.76	0.04	7.47	2.22	-236%
7/12/2023 13:45	20.76	0.04	7.37	2.90	-154%
7/12/2023 13:46	20.76	0.03	7.30	3.16	-131%
7/12/2023 13:47	20.75	0.03	7.24	3.37	-115%
7/12/2023 13:48	20.76	0.03	7.18	2.77	-160%
7/12/2023 13:49	20.75	0.02	7.15	1.79	-299%
7/12/2023 13:50	20.75	0.02	7.31	1.81	-305%
7/12/2023 13:51	20.75	0.02	7.56	18.75	60%
7/12/2023 13:52	20.74	0.03	7.56	37.99	80%
7/12/2023 13:53	20.74	0.04	7.60	37.60	80%
7/12/2023 13:54	20.74	0.04	8.29	38.25	78%
7/12/2023 13:55	20.74	0.05	10.83	42.82	75%
7/12/2023 13:56	20.74	0.05	13.38	48.04	72%
7/12/2023 13:57	20.74	0.06	14.89	49.66	70%
7/12/2023 13:58	20.74	0.07	16.02	50.47	68%
7/12/2023 13:59	20.74	0.07	17.04	51.57	67%
7/12/2023 14:00	20.74	0.07	17.85	52.04	66%
7/12/2023 14:01	20.74	0.07	18.41	51.71	64%

Carbon Bed I/O Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 14:02	20.74	0.07	18.75	48.46	61%
7/12/2023 14:03	20.74	0.07	19.06	47.33	60%
7/12/2023 14:04	20.74	0.07	19.33	47.87	60%
7/12/2023 14:05	20.74	0.07	19.53	48.25	60%
7/12/2023 14:06	20.74	0.07	19.87	48.29	59%
7/12/2023 14:07	20.74	0.07	19.98	49.11	59%
7/12/2023 14:08	20.73	0.07	20.11	50.65	60%
7/12/2023 14:09	20.73	0.07	20.14	51.43	61%
7/12/2023 14:10	20.73	0.07	20.08	52.72	62%
7/12/2023 14:11	20.73	0.07	20.28	53.94	62%
7/12/2023 14:12	20.72	0.06	20.28	56.76	64%
7/12/2023 14:13	20.72	0.06	20.35	57.45	65%
7/12/2023 14:14	20.72	0.06	20.40	58.32	65%
7/12/2023 14:15	20.72	0.07	20.43	57.42	64%
7/12/2023 14:16	20.72	0.07	20.48	60.31	66%
7/12/2023 14:17	20.71	0.07	20.48	60.49	66%
7/12/2023 14:18	20.71	0.07	20.48	60.87	66%
7/12/2023 14:19	20.71	0.06	20.36	61.10	67%
7/12/2023 14:20	20.71	0.06	20.44	62.80	67%
7/12/2023 14:21	20.71	0.06	20.75	82.55	75%
7/12/2023 14:22	20.70	0.07	20.79	69.29	70%
7/12/2023 14:23	20.70	0.07	20.67	61.67	66%
7/12/2023 14:24	20.70	0.07	20.77	60.02	65%
7/12/2023 14:25	20.71	0.06	20.85	57.02	63%
7/12/2023 14:26	20.70	0.06	20.84	54.44	62%
7/12/2023 14:27	20.70	0.06	20.73	52.65	61%
7/12/2023 14:28	20.70	0.06	20.65	44.93	54%
7/12/2023 14:29	20.70	0.06	20.34	36.04	44%
7/12/2023 14:30	20.70	0.06	19.84	32.74	39%
7/12/2023 14:31	20.70	0.06	19.17	28.95	34%
Run 2 Avg	**20.72**	**0.05**	**10.21**	**20.32**	50%
7/12/2023 14:32	20.69	0.06	18.55	24.49	
7/12/2023 14:33	20.69	0.06	18.03	20.67	
7/12/2023 14:34	20.69	0.06	17.41	18.53	
7/12/2023 14:35	20.69	0.06	16.74	10.23	
7/12/2023 14:36	20.69	0.05	15.91	6.44	
7/12/2023 14:37	20.69	0.04	14.97	5.16	
7/12/2023 14:38	20.68	0.04	14.13	4.34	
7/12/2023 14:39	14.49	0.03	13.39	3.89	
7/12/2023 14:40	0.03	0.02	12.68	2.63	
7/12/2023 14:41	0.03	0.02	12.21	2.10	
7/12/2023 14:42	0.03	0.02	11.91	1.99	
7/12/2023 14:43	13.35	10.48	11.58	1.91	
7/12/2023 14:44	20.01	17.94	11.24	1.86	
7/12/2023 14:45	20.01	17.94	10.93	1.83	
7/12/2023 14:46	20.01	17.94	10.58	1.81	
7/12/2023 14:47	20.01	17.94	10.24	1.79	
7/12/2023 14:48	18.02	17.19	9.96	0.58	
7/12/2023 14:49	10.95	8.95	9.69	0.01	
7/12/2023 14:50	10.95	8.95	9.49	3.63	
7/12/2023 14:51	17.43	3.00	9.29	35.05	
7/12/2023 14:52	20.67	0.02	9.15	35.37	
7/12/2023 14:53	20.67	0.02	9.03	35.36	
7/12/2023 14:54	20.67	0.02	9.27	30.34	
7/12/2023 14:55	20.44	0.01	7.02	3.50	
7/12/2023 14:56	20.44	0.00	4.01	2.26	
7/12/2023 14:57	20.45	0.00	2.85	1.95	
7/12/2023 14:58	20.44	0.00	2.44	1.82	
7/12/2023 14:59	20.45	0.00	2.28	1.74	
7/12/2023 15:00	20.44	0.00	2.21	1.68	
7/12/2023 15:01	20.45	0.00	2.17	1.63	
7/12/2023 15:02	20.44	0.00	0.57	1.60	
7/12/2023 15:03	20.44	0.00	-0.02	1.57	
7/12/2023 15:04	20.44	0.00	-0.02	1.57	
7/12/2023 15:05	19.96	0.00	22.70	1.58	
7/12/2023 15:06	18.83	0.00	35.60	1.54	
7/12/2023 15:07	18.82	0.00	34.94	1.51	
7/12/2023 15:08	18.82	0.00	34.97	1.49	
7/12/2023 15:09	18.83	0.00	35.02	1.48	
7/12/2023 15:10	19.84	0.00	13.74	1.45	
7/12/2023 15:11	20.29	0.00	8.76	1.43	
7/12/2023 15:12	20.61	0.01	5.59	1.42	
7/12/2023 15:13	20.63	0.00	5.49	1.41	
7/12/2023 15:14	20.65	0.00	5.99	1.41	
7/12/2023 15:15	20.68	0.01	6.08	1.40	

Carbon Bed I/O Time	O2 %	CO2 %	VOC Out ppm	VOC In ppm	Destruction Eff. %
7/12/2023 15:16	20.68	0.02	6.10	1.40	
7/12/2023 15:17	20.69	0.02	6.08	1.38	
7/12/2023 15:18	20.70	0.02	6.08	1.39	
7/12/2023 15:19	20.71	0.02	6.08	1.33	
7/12/2023 15:20	20.71	0.02	6.06	1.32	
7/12/2023 15:21	20.72	0.02	6.06	1.33	
7/12/2023 15:22	20.72	0.02	6.05	1.34	
7/12/2023 15:23	20.72	0.02	6.04	1.33	
7/12/2023 15:24	20.73	0.02	6.05	1.37	
7/12/2023 15:25	20.73	0.02	6.02	1.38	
7/12/2023 15:26	20.73	0.02	6.04	1.42	
7/12/2023 15:27	20.74	0.02	6.05	1.47	
7/12/2023 15:28	20.74	0.02	6.04	1.54	
Run 3 Start					
7/12/2023 15:29	20.74	0.02	6.05	1.47	-313%
7/12/2023 15:30	20.74	0.02	6.04	1.34	-350%
7/12/2023 15:31	20.74	0.02	6.02	1.30	-364%
7/12/2023 15:32	20.74	0.02	6.04	2.85	-112%
7/12/2023 15:33	20.74	0.02	6.10	8.85	31%
7/12/2023 15:34	20.74	0.02	6.20	13.96	56%
7/12/2023 15:35	20.73	0.03	6.32	20.35	69%
7/12/2023 15:36	20.73	0.04	6.35	15.80	60%
7/12/2023 15:37	20.73	0.05	6.34	18.61	66%
7/12/2023 15:38	20.73	0.06	6.32	19.34	67%
7/12/2023 15:39	20.72	0.06	6.30	34.22	82%
7/12/2023 15:40	20.73	0.08	6.24	22.55	72%
7/12/2023 15:41	20.74	0.07	6.21	21.10	71%
7/12/2023 15:42	20.74	0.06	6.16	22.39	72%
7/12/2023 15:43	20.74	0.06	6.17	22.60	73%
7/12/2023 15:44	20.74	0.06	6.14	23.11	73%
7/12/2023 15:45	20.74	0.06	6.09	25.32	76%
7/12/2023 15:46	20.73	0.06	6.29	34.46	82%
7/12/2023 15:47	20.73	0.06	6.43	67.49	90%
7/12/2023 15:48	20.72	0.09	6.77	48.71	86%
7/12/2023 15:49	20.72	0.09	6.42	23.22	72%
7/12/2023 15:50	20.75	0.09	6.19	3.38	-83%
7/12/2023 15:51	20.76	0.06	6.10	2.50	-144%
7/12/2023 15:52	20.76	0.04	6.00	2.14	-180%
7/12/2023 15:53	20.76	0.03	5.91	2.08	-185%
7/12/2023 15:54	20.76	0.02	5.82	1.78	-228%
7/12/2023 15:55	20.76	0.02	5.77	1.89	-206%
7/12/2023 15:56	20.76	0.02	5.73	1.74	-230%
7/12/2023 15:57	20.77	0.02	5.72	1.74	-228%
7/12/2023 15:58	20.77	0.02	5.72	1.73	-230%
7/12/2023 15:59	20.77	0.02	5.71	1.66	-245%
7/12/2023 16:00	20.77	0.02	5.69	1.62	-250%
7/12/2023 16:01	20.77	0.02	5.69	1.61	-253%
7/12/2023 16:02	20.78	0.02	5.69	1.62	-252%
7/12/2023 16:03	20.78	0.02	5.69	1.49	-282%
7/12/2023 16:04	20.78	0.02	5.67	1.57	-262%
7/12/2023 16:05	20.78	0.02	5.65	1.58	-258%
7/12/2023 16:06	20.78	0.02	5.65	1.59	-255%
7/12/2023 16:07	20.78	0.02	5.63	1.59	-255%
7/12/2023 16:08	20.79	0.02	5.60	1.50	-274%
7/12/2023 16:09	20.79	0.02	5.58	1.56	-258%
7/12/2023 16:10	20.79	0.02	5.56	1.63	-241%
7/12/2023 16:11	20.79	0.02	5.55	1.67	-233%
7/12/2023 16:12	20.79	0.02	5.55	1.63	-241%
7/12/2023 16:13	20.79	0.02	5.54	1.61	-244%
7/12/2023 16:14	20.79	0.02	5.54	1.65	-236%
7/12/2023 16:15	20.79	0.02	5.52	1.61	-242%
7/12/2023 16:16	20.79	0.02	5.51	1.48	-273%
7/12/2023 16:17	20.79	0.02	5.51	1.59	-246%
7/12/2023 16:18	20.79	0.02	5.49	1.52	-262%
7/12/2023 16:19	20.79	0.02	5.51	1.65	-234%
7/12/2023 16:20	20.79	0.02	5.53	1.67	-231%
7/12/2023 16:21	20.79	0.02	5.54	1.63	-241%
7/12/2023 16:22	20.79	0.02	5.58	1.74	-221%
7/12/2023 16:23	20.79	0.02	5.63	1.76	-220%
7/12/2023 16:24	20.79	0.02	5.68	1.94	-193%
7/12/2023 16:25	20.79	0.02	5.72	1.87	-206%
7/12/2023 16:26	20.78	0.02	5.76	1.84	-214%
7/12/2023 16:27	20.79	0.02	5.80	1.84	-215%
7/12/2023 16:28	20.79	0.02	5.81	1.85	-214%
7/12/2023 16:29	20.79	0.02	5.81	1.77	-228%
7/12/2023 16:30	20.79	0.02	5.80	1.81	-221%

Carbon Bed I/O Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 16:31	20.79	0.02	5.83	1.77	-229%
7/12/2023 16:32	20.78	0.02	5.86	1.98	-197%
7/12/2023 16:33	20.78	0.02	5.87	1.96	-200%
7/12/2023 16:34	20.79	0.02	5.86	1.90	-208%
7/12/2023 16:35	20.79	0.02	5.83	1.90	-207%
7/12/2023 16:36	20.79	0.02	5.81	1.84	-215%
7/12/2023 16:37	20.79	0.02	5.80	1.86	-211%
7/12/2023 16:38	20.78	0.02	5.77	1.82	-217%
7/12/2023 16:39	20.79	0.02	5.76	1.82	-216%
7/12/2023 16:40	20.78	0.02	5.76	1.85	-212%
7/12/2023 16:41	20.78	0.02	5.78	1.87	-209%
7/12/2023 16:42	20.78	0.02	5.79	1.91	-204%
7/12/2023 16:43	20.78	0.02	5.83	1.88	-209%
7/12/2023 16:44	20.78	0.02	5.87	1.90	-210%
7/12/2023 16:45	20.78	0.02	5.90	1.90	-210%
7/12/2023 16:46	20.77	0.02	5.88	1.94	-204%
7/12/2023 16:47	20.77	0.02	5.87	1.96	-200%
7/12/2023 16:48	20.77	0.02	5.85	1.84	-218%
7/12/2023 16:49	20.77	0.02	5.85	1.97	-197%
7/12/2023 16:50	20.77	0.02	5.85	1.93	-203%
7/12/2023 16:51	20.77	0.02	5.85	1.96	-199%
7/12/2023 16:52	20.77	0.02	5.88	2.05	-187%
7/12/2023 16:53	20.77	0.02	5.91	2.04	-189%
7/12/2023 16:54	20.77	0.02	5.93	2.14	-178%
7/12/2023 16:55	20.77	0.02	5.92	2.13	-178%
7/12/2023 16:56	20.77	0.02	5.92	2.15	-175%
7/12/2023 16:57	20.77	0.02	5.93	2.14	-176%
7/12/2023 16:58	20.77	0.02	5.94	2.12	-180%
7/12/2023 16:59	20.75	0.02	6.37	28.55	78%
7/12/2023 17:00	20.51	0.09	7.97	92.62	91%
7/12/2023 17:01	20.62	0.63	8.05	77.37	90%
7/12/2023 17:02	20.71	0.50	7.88	25.33	69%
7/12/2023 17:03	20.74	0.21	7.71	11.70	34%
7/12/2023 17:04	20.75	0.11	7.57	6.75	-12%
7/12/2023 17:05	20.76	0.07	7.43	3.26	-128%
7/12/2023 17:06	20.76	0.06	7.32	2.42	-202%
7/12/2023 17:07	20.76	0.04	7.20	2.22	-225%
7/12/2023 17:08	20.76	0.04	7.08	3.35	-111%
7/12/2023 17:09	20.76	0.04	6.99	3.46	-102%
7/12/2023 17:10	20.76	0.03	6.92	3.60	-92%
7/12/2023 17:11	20.76	0.02	6.86	2.98	-130%
7/12/2023 17:12	20.77	0.02	6.79	1.86	-264%
7/12/2023 17:13	20.76	0.02	6.73	1.63	-314%
7/12/2023 17:14	20.76	0.02	7.00	10.66	34%
7/12/2023 17:15	20.76	0.03	6.91	16.21	57%
7/12/2023 17:16	20.76	0.04	6.76	25.13	73%
7/12/2023 17:17	20.75	0.04	6.75	21.50	69%
7/12/2023 17:18	20.75	0.04	7.04	26.67	74%
7/12/2023 17:19	20.74	0.04	8.44	34.45	75%
7/12/2023 17:20	20.75	0.04	9.90	36.44	73%
7/12/2023 17:21	20.74	0.05	11.05	44.02	75%
7/12/2023 17:22	20.74	0.05	12.13	46.95	74%
7/12/2023 17:23	20.73	0.06	13.37	47.79	72%
7/12/2023 17:24	20.72	0.07	14.56	47.18	69%
7/12/2023 17:25	20.71	0.07	15.35	46.39	67%
7/12/2023 17:26	20.71	0.07	15.95	46.82	66%
7/12/2023 17:27	20.70	0.07	16.35	46.11	65%
7/12/2023 17:28	20.69	0.07	16.51	40.80	60%
7/12/2023 17:29	20.69	0.07	16.60	40.16	59%
7/12/2023 17:30	20.68	0.07	16.68	40.75	59%
7/12/2023 17:31	20.67	0.07	16.80	42.34	60%
7/12/2023 17:32	20.67	0.06	16.97	43.06	61%
7/12/2023 17:33	20.66	0.06	17.17	42.57	60%
7/12/2023 17:34	20.66	0.06	17.43	44.61	61%
7/12/2023 17:35	20.66	0.06	17.56	44.58	61%
7/12/2023 17:36	20.66	0.06	17.57	43.96	60%
7/12/2023 17:37	20.66	0.06	17.73	44.81	60%
7/12/2023 17:38	20.65	0.06	17.75	45.45	61%
7/12/2023 17:39	20.65	0.06	17.59	45.29	61%
7/12/2023 17:40	20.65	0.06	17.51	47.43	63%
7/12/2023 17:41	20.65	0.06	17.66	47.20	63%
7/12/2023 17:42	20.65	0.06	17.67	46.68	62%
7/12/2023 17:43	20.65	0.06	17.63	47.56	63%
7/12/2023 17:44	20.64	0.06	17.65	56.79	69%
7/12/2023 17:45	20.64	0.06	17.77	70.27	75%
7/12/2023 17:46	20.65	0.07	17.79	48.17	63%

Carbon Bed I/O Time	O2	CO2	VOC Out	VOC In	Destruction Eff.
	%	%	ppm	ppm	%
7/12/2023 17:47	20.65	0.06	17.83	47.38	62%
7/12/2023 17:48	20.65	0.06	17.87	46.33	61%
7/12/2023 17:49	20.65	0.06	17.88	44.37	60%
7/12/2023 17:50	20.65	0.06	17.84	41.74	57%
7/12/2023 17:51	20.65	0.06	17.78	38.67	54%
7/12/2023 17:52	20.65	0.06	17.67	37.18	52%
7/12/2023 17:53	20.65	0.06	17.52	34.81	50%
7/12/2023 17:54	20.65	0.06	17.32	31.43	45%
7/12/2023 17:55	20.65	0.06	17.05	26.11	35%
7/12/2023 17:56	20.65	0.05	16.78	20.02	16%
7/12/2023 17:57	20.65	0.05	16.28	16.98	4%
7/12/2023 17:58	20.66	0.05	15.47	12.16	-27%
7/12/2023 17:59	20.65	0.05	14.85	10.03	-48%
7/12/2023 18:00	20.65	0.05	13.82	11.43	-21%
Run 3 Avg	**20.74**	**0.05**	**8.91**	**17.37**	49%
7/12/2023 18:01	20.65	0.04	12.86	16.27	
7/12/2023 18:02	20.64	0.04	14.65	29.63	
7/12/2023 18:03	20.35	0.04	8.48	30.97	
7/12/2023 18:04	20.44	0.01	3.24	11.08	
7/12/2023 18:05	20.45	0.00	1.02	6.58	
7/12/2023 18:06	20.45	0.00	0.63	5.37	
7/12/2023 18:07	18.07	0.00	0.51	3.38	
7/12/2023 18:08	0.03	0.02	0.45	2.80	
7/12/2023 18:09	0.03	0.02	0.41	2.63	
7/12/2023 18:10	3.50	3.47	0.39	2.43	
7/12/2023 18:11	18.83	12.19	0.37	1.70	
7/12/2023 18:12	20.01	18.24	0.36	1.48	
7/12/2023 18:13	20.01	18.24	0.03	1.35	
7/12/2023 18:14	17.01	16.56	-0.01	1.26	
7/12/2023 18:15	11.00	8.98	0.00	1.25	
7/12/2023 18:16	11.00	9.00	11.99	1.21	
7/12/2023 18:17	11.00	9.00	34.49	1.12	
7/12/2023 18:18	11.00	9.00	35.01	1.07	
7/12/2023 18:19	15.06	4.35	35.01	1.11	
7/12/2023 18:20	18.86	0.00	34.96	1.07	
7/12/2023 18:21	18.86	0.00	34.72	1.12	
7/12/2023 18:22	19.99	0.00	5.65	3.80	
7/12/2023 18:23	20.65	0.01	7.06	0.79	
7/12/2023 18:24	20.68	0.02	6.36	0.20	
7/12/2023 18:25	20.69	0.02	6.18	-0.01	
7/12/2023 18:26	20.70	0.02	6.09	-0.04	
7/12/2023 18:27	20.71	0.02	6.00	-0.04	
7/12/2023 18:28	20.72	0.02	2.56	30.38	
7/12/2023 18:29	20.74	0.02	1.21	35.12	
7/12/2023 18:30	20.76	0.02	1.51	35.32	
7/12/2023 18:31	20.76	0.02	3.34	35.30	
7/12/2023 18:32	20.78	0.02	1.82	29.87	
7/12/2023 18:33	20.80	0.02	1.35	1.11	
7/12/2023 18:34	20.81	0.02	1.39	1.07	

Carbon Bed I/O
Calibration Error Test at Run 1
Operator: Dan Kirk

Date	7/12/2023								
Analyte	O2	CO2	VOC Out	VOC In		O2	CO2	VOC Out	VOC In
Units	%	%	ppm	ppm					
Zero Ref Cyl	0.0	0.0	0.0	0.0					
Zero Avg	-0.003	0.002	0.048	-0.035	Times	6:37	6:37	6:57	7:16
Zero Error%	0.0%	0.01%	0.1%	0.0%					
Zero CALERR PASS?	PASS	PASS	PASS	PASS					
Mid Ref Cyl	10.96	8.91	50.00	50.00					
Mid Avg	11.00	9.00	50.02	50.02	Times	6:41	6:41	7:05	7:28
Mid Error%	0.2%	0.5%	0.02%	0.02%					
Mid CALERR PASS?	PASS	PASS	PASS	PASS					
High Ref Cyl	20.00	17.92	95.00	95.00					
High Avg	20.01	17.99	95.01	95.05	Times	6:33	6:33	7:01	7:22
High Error%	0.1%	0.4%	0.0%	0.1%					
High CALERR PASS?	PASS	PASS	PASS	PASS					
Low Ref Cyl			35.00	35.00					
Low Avg			34.96	35.23				7:09	7:32

Carbon Bed I/O
Initial System Bias Check for Run 1
Operator: Dan Kirk

Date	7/12/2023								
Analyte	O2	CO2	VOC Out	VOC In		O2	CO2	VOC Out	VOC In
Units	%	%	ppm	ppm					
Zero Ref Cyl	0	0	0	0					
Zero Cal	-0.003	0.002	0.048	-0.035					
Zero Avg	0.023	0.020	0.048	-0.035	Times	6:46	6:46	6:57	7:16
Zero Bias%	0.13%	0.10%	0.00%	0.00%					
Zero IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Span Ref Cyl	20.00	8.91	35.00	35.00					
Span Cal	20.01	9.00	34.96	35.23					
Span Avg	20.08	8.90	34.96	35.23	Times	7:37	6:52	7:09	7:32
Span Bias%	0.35%	-0.55%	0.00%	0.00%					
Span IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					

Carbon Bed I/O
Final System Bias Check for Run 1
Operator: Dan Kirk

Date	7/12/2023								
Analyte	O2	CO2	VOC Out	VOC In		O2	CO2	VOC Out	VOC In
Units	%	%	ppm	ppm					
Zero Ref Cyl	0.00	0.00	0.00	0.00					
Zero Cal	0.00	0.00	0.05	-0.03					
Zero Avg	0.03	0.00	-0.02	0.20	Times	11:26	11:26	11:46	11:58
Zero Bias%	0.14%	0.01%	-0.07%	0.25%					
Zero IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Zero Drift%	0.01%	0.10%	0.07%	0.25%					
Zero Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
Span Ref Cyl	20.00	8.91	35.00	35.00					
Span Cal	20.01	9.00	34.96	35.23					
Span Avg	20.01	8.95	35.10	35.38	Times	11:29	11:33	11:50	12:04
Span Bias%	0.00%	-0.26%	0.15%	0.16%					
Span IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Span Drift%	0.35%	0.30%	0.15%	0.16%					
Span Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
	Run 1								
Ini Zero Avg	0.02	0.02	0.05	-0.03					
Ini Span Avg	20.08	8.90	34.96	35.23					
Run Avg	20.83	0.04	9.13	11.50					
Co	0.02	0.01							
Cm	20.05	8.92							
Correct Avg	20.79	0.03							

Carbon Bed I/O
Final System Bias Check for Run 2
Operator: Dan Kirk

Date	7/12/2023								
Analyte	O2	CO2	VOC Out	VOC In		O2	CO2	VOC Out	VOC In
Units	%	%	ppm	ppm					
Zero Ref Cyl	0.00	0.00	0.00	0.00					
Zero Cal	-0.003	0.002	0.048	-0.035					
Zero Avg	0.034	0.024	-0.016	0.006	Times	14:41	14:41	15:04	14:49
Zero Bias%	0.18%	0.12%	-0.07%	0.04%					
Zero IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Zero Drift%	0.04%	0.12%	0.00%	0.21%					
Zero Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
Span Ref Cyl	20.00	8.91	35.00	35.00					
Span Cal	20.01	9.00	34.96	35.23					
Span Avg	20.01	8.95	34.97	35.36	Times	14:45	14:50	15:08	14:53
Span Bias%	0.00%	-0.25%	0.01%	0.14%					
Span IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Span Drift%	0.00%	0.01%	0.14%	0.02%					
Span Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
	Run 2								
Ini Zero Avg	0.03	0.00	-0.02	0.20					
Ini Span Avg	20.01	8.95	35.10	35.38					
Run Avg	20.72	0.05	10.21	20.32					
Co	0.03	0.01							
Cm	20.01	8.95							
Correct Avg	20.71	0.03							

Carbon Bed I/O
Final System Bias Check for Run 3
Operator: Dan Kirk

Date	7/12/2023								
Analyte	O2	CO2	VOC Out	VOC In		O2	CO2	VOC Out	VOC In
Units	%	%	ppm	ppm					
Zero Ref Cyl	0	0	0	0					
Zero Cal	0.00	0.00	0.05	-0.03					
Zero Avg	0.03	0.02	0.00	-0.04	Times	18:09	18:09	18:15	18:26
Zero Bias%	0.18%	0.12%	-0.05%	0.00%					
Zero IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Zero Drift%	0.00%	0.01%	0.01%	0.04%					
Zero Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
Span Ref Cyl	20.00	8.91	35.00	35.00					
Span Cal	20.01	9.00	34.96	35.23					
Span Avg	20.01	9.00	34.96	35.3	Times	18:13	18:17	18:20	18:31
Span Bias%	0.00%	0.01%	0.00%	0.07%					
Span IBIAS (≤ 5%)?	PASS	PASS	PASS	PASS					
Span Drift%	0.00%	0.26%	0.01%	0.06%					
Span Drift (≤ 3%)?	PASS	PASS	PASS	PASS					
	Run 3								
Ini Zero Avg	0.03	0.02	-0.02	0.01					
Ini Span Avg	20.01	8.95	34.97	35.36					
Run Avg	20.74	0.05	8.91	16.97					
Co	0.03	0.02							
Cm	20.01	8.97							
Correct Avg	20.73	0.02							

Advanced Industrial Resources, Inc.
Field Data Sheet

Client:	GP Toledo AMRS	**Test Date:**	July 12, 2023
Location:	Toledo, OR	**Console ID:**	C-009
Source:	Carbon Bed Outlet	**Y_m / $\Delta H_@$:**	1.013 1.554
Test Team:	JS, DK, DW	**Sampling Box ID:**	B-1
EPA Methods:	1, 2, 3, 4	**Probe Assembly ID:**	OR-P8-01
D_s (in.):	39.0	**D_n (in.):**	0.200 **D_n ID:** OR-GN-200
% O_2	20.79	**Cp:**	0.84
% CO_2	0.03	**P_{bar} (in. Hg):**	30.12
Start Run:	8:45 AM	**p_g (in. H_2O):**	0.30
End Run:	11:45 AM	**Minutes/Point:**	7.5
Run Number:	**1** Filter ID	**K-Factor:**	1.5

		Inches H_2O			Temperature Readings (°F)						
Point	**Meter (dcf)**	**Δp**	**ΔH**	**$(\Delta p)^{1/2}$**	**t_s**	**Probe**	**Filter**	**Last Impinger**	**t_m Average**	**Filter Exit CPM**	**Vacuum (in. Hg)**
1	934.551	0.89	1.34	0.943	71	260	257	58	63	254	1
2	936.46	1.00	1.50	1.000	72	257	259	55	63	255	1
3	944.54	1.00	1.50	1.000	72	258	258	53	63	254	1
4	949.65	1.00	1.50	1.000	71	254	258	52	62	254	1
5	954.71	1.00	1.50	1.000	71	259	256	52	63	251	1
6	959.89	1.10	1.65	1.049	71	260	258	52	63	254	1
7	964.95	1.20	1.80	1.095	71	262	257	52	63	253	1
8	971.08	1.20	1.80	1.095	71	262	257	53	63	252	1
9	977.20	1.10	1.65	1.049	72	257	257	53	64	252	1
10	983.32	1.00	1.50	1.000	72	259	260	53	64	257	1
11	989.37	1.00	1.50	1.000	72	259	258	54	64	253	1
12	995.63	1.00	1.50	1.000	72	257	256	54	64	251	1
13	1001.59	0.84	1.26	0.917	74	258	258	55	65	255	1
14	1007.66	1.00	1.50	1.000	73	259	258	55	66	254	1
15	1013.10	0.99	1.49	0.995	73	261	256	56	67	252	1
16	1018.26	1.00	1.50	1.000	83	257	259	56	67	256	1
17	1024.22	1.10	1.65	1.049	93	260	256	57	67	251	1
18	1029.89	1.10	1.65	1.049	96	260	256	57	68	250	1
19	1034.98	1.10	1.65	1.049	97	259	254	57	68	250	1
20	1040.42	1.20	1.80	1.095	98	260	257	58	67	253	1
End	1042.976										

Total moisture collected (g):	25.4		
Theoretical maximum moisture collection at saturation (g):	76.6		
Pre System Leak Check (cfm):	0.000	@	16"
Post System Leak Check (cfm):	0.000	@	16"

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	850.5	811.5	822.3		980.7	3465.0	g
Post-test:	853.8	815.5	827.8		993.3	3490.4	g
Net gain:	3.3	4	5.5	0	12.6	**25.4**	g

Advanced Industrial Resources, Inc.
Field Data Sheet

Client:	GP Toledo AMRS	**Test Date:**	July 12, 2023
Location:	Toledo, OR	**Console ID:**	C-009
Source:	Carbon Bed Outlet	**Y_m / $\Delta H_@$:**	1.013 / 1.554
Test Team:	JS, DK, DW	**Sampling Box ID:**	B-1
EPA Methods:	1, 2, 3, 4	**Probe Assembly ID:**	OR-P8-01
D_s (in.):	39.0	**D_n (in.):**	0.200 **D_n ID:** OR-GN-200
% O_2	20.7	**Cp:**	0.84
% CO_2	0.1	**P_{bar} (in. Hg):**	30.12
Start Run:	12:12 PM	**p_g (in. H_2O):**	0.30
End Run:	2:32 PM	**Minutes/Point:**	7.5
Run Number:	2 Filter ID	**K-Factor:**	1.5

		Inches H_2O			Temperature Readings (°F)						
Point	**Meter (dcf)**	**Δp**	**ΔH**	**$(\Delta p)^{1/2}$**	**t_s**	**Probe**	**Filter**	**Last Impinger**	**t_m Average**	**Filter Exit CPM**	**Vacuum (in. Hg)**
1	45.194	0.88	1.32	0.938	80	258	257	67	69	253	1
2	50.58	0.99	1.49	0.995	79	256	258	59	69	254	1
3	56.00	1.00	1.50	1.000	78	256	259	59	69	254	1
4	61.44	1.00	1.50	1.000	77	257	255	59	69	251	1
5	67.00	1.00	1.50	1.000	77	257	257	59	69	254	1
6	71.41	1.10	1.65	1.049	77	259	258	59	69	255	1
7	75.98	1.20	1.80	1.095	77	260	258	59	69	253	1
8	83.24	1.20	1.80	1.095	77	260	258	58	69	254	1
9	88.69	1.20	1.80	1.095	77	259	260	58	69	256	1
10	94.13	1.00	1.50	1.000	77	258	256	57	69	253	1
11	99.56	1.00	1.50	1.000	77	256	256	57	69	252	1
12	105.02	1.00	1.50	1.000	77	258	254	57	70	250	1
13	110.69	0.90	1.35	0.949	76	260	257	57	71	254	1
14	115.93	1.00	1.50	1.000	76	261	258	56	77	255	1
15	121.47	1.00	1.50	1.000	90	260	257	56	81	253	1
16	127.50	1.00	1.50	1.000	96	257	257	56	87	253	1
17	133.21	1.10	1.65	1.049	97	256	258	56	88	254	1
18	138.96	1.10	1.65	1.049	97	259	257	56	88	253	1
End	143.972										

Total moisture collected (g):	19.4		
Theoretical maximum moisture collection at saturation (g):	78.5		
Pre System Leak Check (cfm):	0.013	@	18"
Post System Leak Check (cfm):	0.014	@	19"

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	803.4	821.6	805.6		998.2	3428.8	g
Post-test:	813.3	826.3	808.1		1000.5	3448.2	g
Net gain:	9.9	4.7	2.5	0	2.3	**19.4**	g

Advanced Industrial Resources, Inc.
Field Data Sheet

Client:	GP Toledo AMRS	**Test Date:**	July 12, 2023
Location:	Toledo, OR	**Console ID:**	C-009
Source:	Carbon Bed Outlet	**Y_m / $\Delta H_@$:**	1.013 / 1.554
Test Team:	JS, DK, DW	**Sampling Box ID:**	B-1
EPA Methods:	1, 2, 3, 4	**Probe Assembly ID:**	OR-P8-01
D_s (in.):	39.0	**D_n (in.):**	0.200 **D_n ID:** OR-GN-200
% O_2	20.8	**Cp:**	0.84
% CO_2	0.0	**P_{bar} (in. Hg):**	30.12
Start Run:	3:29 PM	**p_g (in. H_2O):**	0.30
End Run:	6:01 PM	**Minutes/Point:**	7.5
Run Number:	3 Filter ID	**K-Factor:**	1.5

		Inches H_2O			Temperature Readings (°F)						
Point	**Meter (dcf)**	**Δp**	**ΔH**	**$(\Delta p)^{1/2}$**	**t_s**	**Probe**	**Filter**	**Last Impinger**	**t_m Average**	**Filter Exit CPM**	**Vacuum (in. Hg)**
1	151.295	0.90	1.35	0.949	78	258	256	62	94	253	4
2	156.86	1.00	1.50	1.000	78	259	257	47	93	253	4
3	162.70	1.00	1.50	1.000	78	259	255	48	93	251	4
4	169.05	1.00	1.50	1.000	76	257	257	48	86	252	4
5	174.76	1.00	1.50	1.000	77	260	257	49	79	252	4
6	180.49	1.10	1.65	1.049	77	259	258	49	74	254	4
7	185.86	1.10	1.65	1.049	77	259	257	49	72	253	4
8	191.96	1.20	1.80	1.095	78	256	260	49	71	256	4
9	196.41	1.20	1.80	1.095	78	259	259	49	70	253	4
10	202.07	1.00	1.50	1.000	78	260	258	49	69	254	4
11	207.42	1.00	1.50	1.000	78	257	257	49	69	253	4
12	213.37	1.00	1.50	1.000	78	258	255	49	69	251	4
13	219.56	0.89	1.34	0.943	78	260	258	50	68	254	4
14	223.57	1.00	1.50	1.000	78	260	258	50	68	254	4
15	227.59	1.00	1.50	1.000	78	258	257	50	68	253	4
16	235.41	1.00	1.50	1.000	92	259	255	50	69	251	4
17	240.79	1.10	1.65	1.049	99	260	257	50	69	253	4
18	246.12	1.10	1.65	1.049	99	256	259	51	69	252	4
19	251.51	1.10	1.65	1.049	100	258	258	51	69	254	4
End	257.863										

Total moisture collected (g):	37.9		
Theoretical maximum moisture collection at saturation (g):	86.3		
Pre System Leak Check (cfm):	0.016	@	16"
Post System Leak Check (cfm):	0.016	@	16"

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	832.7	823.6	806.2		1000.5	3463.0	g
Post-test:	860.0	827.8	809.4		1003.7	3500.9	g
Net gain:	27.3	4.2	3.2	0	3.2	**37.9**	g

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (Juno) | Test Date: 7.12.23
Location: Toledo, OH | Console ID: C-009
Source: Carbon Bed Outlet | Y_m / $\Delta H_@$: 1.013/1.554
Test Team: JJ, DK, DW | Sampling Box ID: B-1
EPA Methods: NCASI 105.01 | Probe Assembly ID: OR-18-01
D_s (in.): 39 | D_n (in.): .200 | D_n ID: OK-GN-200
% O_2 20.79 | Assumed B_{ws}: 1%
% CO_2 0.03 | P_{bar} (in. Hg): 30.12
Start Run: 845 | p_g (in. H_2O): .30
End Run: 1115 | Minutes/Point: 7.5
Run Number: 1 | Filter ID: | K-Factor: 1.5

2 hour 24 min Run time

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	934.551	.89	1.38	71	260	257	58	63	63	254	1
2	936.461	1.0	1.5	72	257	259	55	63	63	255	1
3	944.539	1.0	1.5	72	258	258	53	63	63	254	1
4	949.650	1.0	1.5	71	254	258	52	62	62	254	1
5	954.713	1.0	1.5	71	259	256	52	63	63	251	1
6	959.888	1.1	1.65	71	260	258	52	63	63	254	1
7	964.953	1.2	1.80	71	262	257	52	63	63	253	1
8	971.081	1.2	1.80	71	262	257	53	63	63	252	1
9	977.199	1.1	1.65	72	257	257	53	64	64	252	1
10	983.319	1.0	1.5	72	259	260	53	64	64	257	1
11	989.370	1.0	1.5	72	259	258	54	64	64	253	1
12	995.631	1.0	1.5	72	257	256	54	64	64	251	1
				Change Ports							
1	1001.593	.84	1.26	74	258	258	55	65	65	255	1
2	1007.605	1.0	1.5	73	259	258	55	66	66	254	1
3	1013.099	.99	1.485	73	261	256	56	67	67	252	1
4	1018.263	1.0	1.5	83	257	259	56	67	67	256	1
5	1024.222	1.1	1.65	93	260	256	57	67	67	251	1
6	1029.886	1.1	1.65	96	260	256	57	68	68	250	1
7	1034.978	1.1	1.65	97	259	254	57	68	68	250	1
8	1040.415	1.2	1.80	98	260	257	58	67	67	253	1
9	1042.976										
10											
11											
12											
End											

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	850.5	811.5	822.3		980.7	3645	g 3465
Post-test:	853.8	815.5	827.8		993.3	3490.4	g
Net gain:	3.3	4.0	5.5		12.6	25.4	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.000 @ 16"
Pitot A: ✓
Pitot B: ✓

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.000 @ 16"
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: OR-WS-500 | OR-WS-100
Actual / Response 500 g / 500 . | 100 g / 100

Test Team Leader Review: _____ | Reagent 1: HCl/AA | Lot No: 20390188
Data Entry Review: _____ | Reagent 2: _____ | Lot No: _____

REV102921

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (JUNO) | Test Date: 7.12.23
Location: Toledo, OR | Console ID: C-004
Source: Carbon Bed Outlet | Y_m / $\Delta H_@$: 1.023 / 1.655
Test Team: JS, DK, DW | Sampling Box ID: B-2
EPA Methods: NCASI 105.01 | Probe Assembly ID:
D_s (in.): 39 | D_n (in.): .200 | D_n ID: OR-GN-200
% O_2 20.79 | Assumed B_{ws}: 1%
% CO_2 0.03 | P_{bar} (in. Hg): 30.12
Start Run: 845 | p_g (in. H_2O): .30
End Run: 1115 | Minutes/Point: 7.5
Run Number: 1 Dupe Filter ID: | K-Factor: 1.6

2 hours 24 min Run time

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	742.572	.88	1.32	71	260	257	63	68	68	253	1
2	747.372	1.0	1.6	72	262	256	60	68	68	252	1
3	752.412	1.0	1.6	72	257	259	54	68	68	255	1
4	757.667	1.0	1.6	71	255	255	53	69	69	251	1
5	762.703	1.0	1.6	71	259	255	52	69	69	251	1
6	767.873	1.0	1.6	71	257	256	52	69	69	252	1
7	773.104	1.1	1.76	71	257	256	52	71	71	253	1
8	778.783	1.2	1.92	71	256	256	52	71	71	253	1
9	784.645	1.2	1.92	72	257	259	52	71	71	254	1
10	790.463	1.2	1.92	72	259	256	53	71	71	253	1
11	796.211	1.2	1.92	72	258	258	53	71	71	255	1
12	802.148	1.2	1.92	72	260	259	53	72	72	256	1
	Change Ports										
1	807.775	.87	1.392	74	260	257	53	72	72	257	1
2	813.590	.98	1.568	73	258	258	53	74	74	254	1
3	819.064	1.0	1.60	73	258	257	54	74	74	253	1
4	824.203	1.0	1.60	83	259	259	56	74	74	254	1
5	830.114	1.1	1.76	93	256	259	57	75	75	256	1
6	836.271	1.1	1.76	96	259	256	57	75	75	253	1
7	841.088	1.2	1.92	97	258	257	57	75	75	254	1
8	846.606	1.2	1.92	98	262	257	58	74	74	253	1
9	848.870										
10											
11											
12											
End											

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	910.1	875.1	859.6		950.7	3595.5	g
Post-test:	907.7	875.4	859.2		952.2	3594.5	g
Net gain:	-2.4	.3	-.4		1.5	-1	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.015 @17"
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: OR-WS-500 OR-WS-100
Actual / Response 500 g / 500 · 100 g / 100

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.012 @16"
Pitot A: ✓
Pitot B: ✓

Test Team Leader Review: _____ Reagent 1: Hexane Lot No: 20390188
Data Entry Review: _____ Reagent 2: _____ Lot No: _____

REV102921

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (JUNO) | Test Date: 7·12·23
Location: Toledo, OR | Console ID: C-009
Source: Carbon Bed Outlet | Y_m / $\Delta H_@$: 1.013/1.554
Test Team: JS, DK, DW | Sampling Box ID: B-1
EPA Methods: NCASI 105.01 | Probe Assembly ID: OK-PB-02
D_s (in.): 39 | D_n (in.): .200 | D_n ID: OR-GN-200
% O_2 20.72 | Assumed B_{ws}: 1%
% CO_2 0.05 | P_{bar} (in. Hg): 30.32
Start Run: 12:12 | p_g (in. H_2O): .30
End Run: 14:32 | Minutes/Point: 7·5
2:14 Run Time
Run Number: 2 | Filter ID: | K-Factor: 1·5

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	45.194	.88	1.32	80	258	257	67	69	69	253	(
2	50.584	.99	1.485	79	256	258	59	69	69	254	1
3	56.002	1.0	1.5	78	256	259	59	69	69	254	(
4	61.437	1.0	1.5	77	257	255	59	69	69	251	1
5	67.004	1.0	1.5	77	257	257	59	69	69	254	1
6	71.408	1.1	1.65	77	259	258	59	69	69	255	1
7	75.980	1.2	1.80	77	260	258	59	69	69	253	1
8	83.239	1.2	1.80	77	260	258	58	69	69	254	1
9	88.687	1.2	1.65	77	259	260	58	69	69	256	1
10	94.125	1.0	1.50	77	258	256	57	69	69	253	1
11	99.564	1.0	1.50	77	256	256	57	69	69	252	1
12	105.026	1.0	1.50	77	258	254	57	70	70	250	1
6:00 Port change	Change Ports										
1	110.688	.90	1.35	76	260	257	57	71	71	254	1
2	115.927	1.0	1.50	76	261	258	56	77	77	255	1
3	121.477	1.0	1.50	90	260	257	56	81	81	253	1
4	127.498	1.0	1.50	96	257	257	56	87	87	253	1
5	133.214	1.1	1.65	97	256	258	56	88	88	254	1
6	138.962	1.1	1.65	97	259	257	56	88	88	253	1
7	143.972										
8											
9											
10											
11											
12											
End											

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	803.4	821.6	805.6		998.2	3428.8	g
Post-test:	813.3	826.3	808.1		1000.5	3448.2	g
Net gain:						19.4	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.013 @ 18"
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: OR-WS-500 OR-WS-100
Actual / Response 500 g / 500 100 g / 100

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.014 @ 19"
Pitot A: ✓
Pitot B: ✓

Test Team Leader Review: | Reagent 1: Hexane | Lot No: 20390188
Data Entry Review: | Reagent 2: | Lot No:

REV102921

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (Jino) | Test Date: 7.12.23
Location: Toledo, OR | Console ID: C-004
Source: Carbon Bed Outlet | Y_m / $\Delta H_@$: 1.023/1.655
Test Team: JJ, DK, DW | Sampling Box ID: B-2
EPA Methods: NCASI 105.01 | Probe Assembly ID: OR-P8-01
D_s (in.): 39 | D_n (in.): .200 | D_n ID: GN-OR-200
% O_2 20.72 | Assumed B_{ws}: 1%
% CO_2 0.05 | P_{bar} (in. Hg): 30.12
Start Run: 12:12 | p_g (in. H_2O): .30
End Run: 14:32 | Minutes/Point: 7.5
2:14 Runtime
Run Number: 2 Low Spike | Filter ID: | K-Factor: 1.6

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	850.964	.88	1.408	80	260	258	61	73	73	254	1
2	856.117	.97	1.552	79	259	258	57	73	73	254	1
3	861.332	1.0	1.60	78	257	257	56	74	74	254	1
4	866.471	1.0	1.60	77	259	258	55	75	75	254	1
5	871.780	1.0	1.60	77	260	258	55	75	75	254	1
6	876.914	1.0	1.60	77	260	257	56	76	76	254	1
7	880.225	1.1	1.76	77	258	258	56	75	75	255	1
8	887.181	1.2	1.92	77	257	257	56	77	77	253	1
9	892.304	1.2	1.92	77	259	256	57	77	77	252	1
10	897.672	1.2	1.92	77	258	255	57	78	78	252	1
11	903.511	1.2	1.92	77	259	257	57	81	81	253	1
12	908.344	1.2	1.92	77	259	259	57	81	81	256	1
6:00 Port change	Change Ports										
1	913.831	.88	1.408	77	260	256	58	83	83	252	1
2	919.065	1.0	1.60	76	258	257	58	85	85	253	1
3	924.491	1.0	1.60	90	259	258	58	86	86	254	1
4	930.520	1.0	1.60	96	258	256	59	88	88	252	1
5	936.351	1.0	1.60	96	259	257	59	90	90	243	1
6	942.120	1.1	1.76	96	257	257	59	90	90	243	1
7	947.208										
8											
9											
10											
11											
12											
End											

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
810.8 Pre-test:	~~815.6~~	832.1	816.6		952.2	~~3406.5~~	g 3411.7
821.0 Post-test:	~~825.8~~	838.3	822.1		970.2	~~3446.4~~	g 3451.2
Net gain:						39.9	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.002 @ 19"
Pitot A: ✓
Pitot B: ✓

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.003 @ 17"
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: OR-WS-500 OR-WS-100
Actual / Response 500 g / 500 · 100 g / 100

Test Team Leader Review: | Reagent 1: Hexane | Lot No: 20390188
Data Entry Review: | Reagent 2: | Lot No:

REV102921

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (JUNO)
Location: Toledo, OH
Source: Carbon Bed Outlet
Test Team: JS, DK, DW
EPA Methods: NCASI 105.01
D_s (in.): 39
% O_2: 20.79
% CO_2: 0.07
Start Run: 15:29
End Run: 18:01
Run Number: 3 Filter ID:

Test Date: 7.12.13
Console ID: C-009
Y_m / $\Delta H_@$: 1.013 / 1.554
Sampling Box ID: B-1
Probe Assembly ID: P8-01
D_n (in.): 200 D_n ID: OR-GN-200
Assumed B_{ws}: 1%
P_{bar} (in. Hg): 30.12
p_g (in. H_2O): .30
Minutes/Point: 7.5
K-Factor: 1.5

2:24 Run time

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	151.295	.90	1.35	78	258	256	62	94	94	253	4
2	156.862	1.0	1.50	78	259	257	47	93	93	253	4
3	162.695	1.0	1.50	78	259	255	48	93	93	251	4
4	169.046	1.8	1.50	76	257	257	48	86	86	252	4
5	174.760	1.0	1.50	77	260	257	49	79	79	252	4
6	180.493	1.1	1.65	77	259	258	49	74	74	254	4
7	185.860	1.1	1.65	77	259	257	49	72	72	253	4
8	191.956	1.2	1.80	78	256	260	49	71	71	256	4
9	196.411	1.2	1.80	78	259	257	49	70	70	253	4
10	202.071	1.0	1.50	78	260	258	49	69	69	254	4
11	207.421	1.0	1.50	78	257	257	49	69	69	253	4
12	213.373	1.0	1.50	78	253	255	48	69	69	251	4
				Change Ports							
1	219.563	.89	1.375	78	260	258	50	68	68	254	4
2	223.570	1.0	1.50	78	260	258	50	68	68	254	4
3	227.588	1.0	1.50	78	258	257	50	68	68	253	4
4	235.411	1.0	1.50	98	259	255	50	69	69	251	4
5	240.791	1.1	1.65	99	260	257	50	69	69	253	4
6	246.115	1.1	1.65	99	256	259	51	69	69	252	4
7	251.512	1.1	1.65	100	258	258	51	69	69	254	4
8	257.863										
9											
10											
11											
12											
End											

6:00 Port Change

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	832.7	823.6	806.2		1000.5	3468	g
Post-test:	860.0	827.8	809.4		1003.7	3500.9	g
Net gain:						~~32.9~~ 37.9	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.016 @ 16"
Pitot A: ✓
Pitot B: ✓

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.016 @ 16
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: WS-OR-500 WS-OR-100
Actual / Response 500 g / 500 · 100 g / 100

Test Team Leader Review: _____ Reagent 1: Hexane Lot No: 20390188
Data Entry Review: _____ Reagent 2: _____ Lot No: _____

REV102921

Advanced Industrial Resources, Inc.

Field Data Sheet

Client: GP Toledo (JUNO) | Test Date: 7.12.23
Location: Toledo, OR | Console ID: ~~C004~~ C-004
Source: Carbon Bed Outlet | Y_m / $\Delta H_@$: 1.023/1.655
Test Team: SS, DK, DW | Sampling Box ID: B-2
EPA Methods: MASI 105.01 | Probe Assembly ID: P8-02
D_s (in.): 39 | D_n (in.): .200 | D_n ID: GN-OR-200
% O_2 20.79 | Assumed B_{ws}: 1%
% CO_2 0.03 | P_{bar} (in. Hg): 30.12
Start Run: 1529 | p_g (in. H_2O): .30
End Run: 18:01 | Minutes/Point: 7.5
Run Number: 3 high spike | Filter ID: | K-Factor: 1.6

Point	Meter (dcf)	Inches H_2O Δp	Inches H_2O ΔH	Temperature Readings (°F) t_s	Probe	Filter Box	Last Impinger	t_m Inlet	t_m Outlet	Filter Exit (M5 or CPM)	Vacuum (in. Hg)
1	947.475	.91	1.456	78	259	256	64	89	89	253	/
2	952.996	1.0	1.60	78	259	257	49	88	88	254	/
3	959.154	1.0	1.60	78	257	257	49	87	87	254	/
4	~~694.117~~ 964.914	1.0	1.60	76	259	257	49	85	85	254	/
5	970.710	1.0	1.60	76	261	256	49	84	84	253	/
6	976.12	1.1	1.76	75	260	258	49	82	82	256	/
7	981.400	1.2	1.92	75	260	257	50	81	81	257	/
8	987.065	1.2	1.92	78	258	257	50	80	80	254	/
9	991.395	1.2	1.92	78	257	259	50	81	81	2576	/
10	996.974	1.2	1.92	76	258	256	50	80	80	252	/
11	1002.030	1.2	1.92	78	256	258	50	79	79	255	/
12	1007.717	1.2	1.92	78	259	257	50	79	79	254	/
				Change Ports							
1	1013.511	.90	1.44	78	259	258	50	78	78	255	/
2	1018.420	1.0	1.60	78	259	257	50	78	78	253	/
3	1022.008	1.0	1.60	78	260	257	51	78	78	253	/
4	1029.003	1.0	1.60	98	261	258	51	79	79	254	/
5	1034.455	1.0	1.60	99	257	257	51	78	78	252	/
6	1039.823	1.1	1.76	99	257	259	51	78	78	253	/
7	1045.113	1.1	1.76	100	257	258	52	77	77	253	/
8	1051.307										
9											
10											
11											
12											
End											

6:00 Port Change

Moisture collected (g)

	Imp. 1	Imp. 2	Imp. 3	Imp. 4	SG Imp.	Total	
Pre-test:	854.0	793.4	806.8		970.2	3424.4	g
Post-test:	879.2	797.6	806.6		983.3	3466.7	g
Net gain:						42.3	g

Pre-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.001 @ 16"
Pitot A: ✓
Pitot B: ✓

Post-Run Leak Checks (dcfm @ "Hg)
Sampling Line: 0.002 @ 17"
Pitot A: ✓
Pitot B: ✓

Reference Wt ID: WS-OR-500 WS-OR-100
Actual / Response 500 g / 500 . 100 g / 100

Test Team Leader Review: | Reagent 1: Hexane | Lot No: 20390188
Data Entry Review: | Reagent 2: | Lot No:

REV102921

Advanced Industrial Resources, Inc.

Source Description, Absence of Cyclonic Flow Verification, & Nozzle Diameter Measurement Field Data Sheet

Client: GP (Juno) Date: 7.12.23
Location: Toledo (Juno) Test Team: DW, JS, DK
Source: Carbon Bed Outlet

Duct Cross Section #1
D_1 (in.): ~~39~~ 46.5
Port length$_1$ (in.): 7.5
D_s (in.): 39

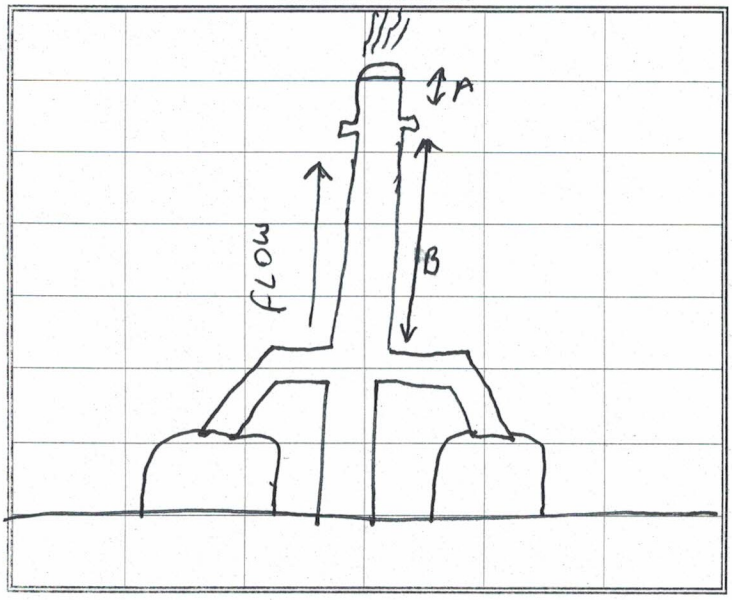
Duct Cross Section #2
D_2 (in.): ~~39~~ 46.5
Port length$_2$ (in.): 7.5
A_s (ft^2): 39

Up- & Down-Stream Flow Disturbance Distances
Length A (in.): 84 Equiv. Diameter: 2.15
Length B (in.): 324 Equiv. Diameter: 8.30

t_{amb} (°F): 60
Assumed B_{ws}: 1%
P_{bar} (in. Hg): 30.12
P_g (in. H_2O): .30
% O_2: 20.8 % CO_2: 0
Console ID: C-009
Y: 1.013 $\Delta H_@$: 1.554
Pitot tube ID: OR-PP-01 C_p: .84
K-Factor: 1.5

Nozzle Measurement Data Performed By: SS
Nozzle ID: OR-GN-200 Caliper ID: CP-01
$D_{n,1}$ (in.): .200 $D_{n,2}$ (in.): .200 $D_{n,3}$ (in.): .200
D_n (in.): .200
A_n (ft^2): .000277

Sketch of Stack



Representative ΔP & Temperature			Cyclonic Flow Absence Verification Data	
Traverse Point	Δp (in. H_2O)	t_s (°F)	Δp (in. H_2O)	Null α (degrees)
1	.87	71	0.0	1
2	.98	71	0.0	3
3	.99	71	0.0	-1
4	1.0	72	0.0	-1
5	1.0	72	0.0	0
6	1.1	72	0.0	2
7	1.2	72	0.0	4
8	1.1	72	0.0	4
9	1.1	72	0.0	0
10	1.1	72	0.0	-2
11	1.1	72	0.0	3
12	1.0	72	0.0	0
1	.80	72	0.0	0
2	.95	72	0.0	-1
3	1.0	72	0.0	1
4	1.0	72	0.0	3
5	1.1	72	0.0	2
6	1.1	72	0.0	-1
7	1.1	72	0.0	0
8	1.2	72	0.0	-3
9	1.2	72	0.0	-1
10	1.2	72	0.0	-1
11	1.2	72	0.0	0
12	1.1	72	0.0	2
			0.0	
			0.0	
			0.0	
			0.0	
			0.0	
			0.0	

*Note port changes

Test Team Leader Review: _____
Data Entry Review: _____

REV010623

APPENDIX E

LABORATORY REPORTS

Advanced Industrial Resources, Inc.

3407 Novis Pointe NW
Acworth, GA 30101

Georgia Pacific
Juno Toledo, OR
Client Project # KR11456

Analytical Report
(0623-263)

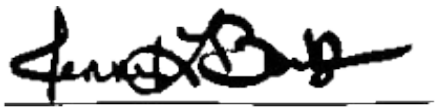
NCASI Method A105.01
Methanol, Phenol (By GC/FID)
Acetaldehyde, Formaldehyde, Propionaldehyde, Acrolein (By GC/NPD)

Enthalpy Analytical, LLC
Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www.enthalpy.com
800-1 Capitola Drive Durham, NC 27713-4385

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF). This report shall not be reproduced except in full without approval of the laboratory. This will provide assurance that parts of a report are not taken out of context.



QA Review Performed by – Jennifer Bowker

Report Issued: 8/4/23

ENTHALPY ANALYTICAL

Summary of Results

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Summary Table

Catch Weight (ug)

Sample ID	Methanol	Phenol
Test 1 Normal	2,008	102 J
Test 1 DUP	34.6 ND	47.8 ND
Test 2 Normal	3,451	107 J
Test 2 Low SPK	4,374	575
Test 3 Normal	4,853	182
Test 3 High SPK	11,347	23,138
Train Spike	7,093	23,629
Field SPK - Low	591	619
Field SPK - High	7,161	22,439
BHA Blank	17.7 ND	24.4 ND

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Summary Table

Compound / Catch Weight (ug)

Sample ID	Acetaldehyde	Acrolein	Formaldehyde	Propionaldehyde
Test 1 Normal	1,772	4.60 ND	10.8 J	7.50 J
Test 1 DUP	29.5 J	6.69 ND	9.50 J	11.5 J
Test 2 Normal	2,720	4.71 ND	14.9 J	6.86 J
Test 2 Low SPK	3,514	206	272	265
Test 3 Normal	3,296	4.71 ND	20.5 J	10.4 J
Test 3 High SPK	13,496	12,208	6,744	13,614
Train Spike	11,003	12,863	7,287	14,202
Field SPK - Low	346	300	301	361
Field SPK - High	10,374	12,197	7,177	13,346
BHA Blank	13.7 J	13.6 J	8.13 J	15.9 J

Results

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Methanol

Sample ID	Filename	MDL	Curve Min	Curve Max	Ret Time (min)	Conc. (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	001F0201.D	0.0679	0.380	949	11.72	6.08	1	330	2,008	
Test 1 DUP	002F0301.D	0.0679	0.380	949	NA	0.0679	1	510	34.6	ND
Test 2 Normal	003F0401.D	0.0679	0.380	949	11.74	9.86	1	350	3,451	
Test 2 Low SPK	004F0501.D	0.0679	0.380	949	11.74	12.1	1	360	4,374	
Test 3 Normal	006F0701.D	0.0679	0.380	949	11.73	13.9	1	350	4,853	
Test 3 High SPK	007F0801.D	0.0679	0.380	949	11.73	36.6	1	310	11,347	
Train Spike	008F0901.D	0.0679	0.380	949	11.74	22.5	1	315	7,093	
								Spike Amount	7,354	
								Spike Recovery (%)	96.4%	
Field SPK - Low	009F1001.D	0.0679	0.380	949	11.73	1.94	1	305	591	
								Spike Amount	513	
								Spike Recovery (%)	115%	
Field SPK - High	011F1101.D	0.0679	0.380	949	11.74	22.6	1	317	7,161	
								Spike Amount	7,354	
								Spike Recovery (%)	97.4%	
BHA Blank	097F0401.D	0.0679	0.380	949	NA	0.0679	1	260	17.7	ND

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Phenol

Sample ID	Filename	MDL	Curve Min	Curve Max	Ret Time (min)	Conc. (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	001F0201.D	0.0938	0.419	1,047	24.83	0.310	1	330	102	J
Test 1 DUP	002F0301.D	0.0938	0.419	1,047	NA	0.0938	1	510	47.8	ND
Test 2 Normal	003F0401.D	0.0938	0.419	1,047	24.86	0.306	1	350	107	J
Test 2 Low SPK	004F0501.D	0.0938	0.419	1,047	24.84	1.60	1	360	575	
Test 3 Normal	006F0701.D	0.0938	0.419	1,047	24.85	0.520	1	350	182	
Test 3 High SPK	007F0801.D	0.0938	0.419	1,047	24.83	74.6	1	310	23,138	
Train Spike	008F0901.D	0.0938	0.419	1,047	24.84	75.0	1	315	23,629	
								Spike Amount	22,198	
								Spike Recovery (%)	106%	
Field SPK - Low	009F1001.D	0.0938	0.419	1,047	24.84	2.03	1	305	619	
								Spike Amount	498	
								Spike Recovery (%)	124%	
Field SPK - High	011F1101.D	0.0938	0.419	1,047	24.84	70.8	1	317	22,439	
								Spike Amount	22,198	
								Spike Recovery (%)	101%	
BHA Blank	097F0401.D	0.0938	0.419	1,047	NA	0.0938	1	260	24.4	ND

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

QC Samples

QC Type	QC Sample Name		Methanol	Phenol
Spiked Blank Solvent	gcprep5570 #LCS-L-BHA	catch (ug)	514	515
	spiked:	spike (ug)	513	498
	spikeprep2042.SP-LOW * 100uL	recovery	100%	104%
Spiked Blank Solvent	gcprep5570 #LCS-H-BHA	catch (ug)	7,082	22,697
	spiked:	spike (ug)	7,355	22,198
	spikeprep2042.SP-HIGH * 1000uL	recovery	96.3%	102%
Lab Dup	LD / Test 2 Low SPK	ug/mL	11.5	1.80
	Test 2 Low SPK	ug/mL	12.1	1.60
		RD	5.8%	12.1%
Blank Solvent	gcprep5570 #MB-BHA	ug/mL	ND	ND

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Spike and Recovery Calculations

Analyte: Methanol

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	591	Spiked Train		4,374	96.244	171%
		Un-spiked Train		3,451	98.778	

Analyte: Methanol

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	7,161	Spiked Train		11,347	103.832	92.4%
		Un-spiked Train		4,853	106.568	

Analyte: Phenol

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	619	Spiked Train		575	96.244	76.0%
		Un-spiked Train	J	107	98.778	

Analyte: Phenol

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	22,439	Spiked Train		23,138	103.832	102%
		Un-spiked Train		182	106.568	

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/FID) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Duplicate % Difference Calculations

Analyte: Methanol

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train		2,008	108.425	NA
	Duplicate Train	ND	34.6	106.298	

Analyte: Phenol

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train	J	102	108.425	NA
	Duplicate Train	ND	47.8	106.298	

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Acetaldehyde

Client's Sample Name	Filename #1	MDL	Curve Min	Curve Max	Ret Time (min)	Conc #1 (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	026B0801.D	0.0519	0.473	108	NA	20.6	1	86.0	1,772	
Test 1 DUP	027B0901.D	0.0519	0.473	108	NA	0.236	1	125	29.5	J
Test 2 Normal	028B1001.D	0.0519	0.473	108	NA	30.9	1	88.0	2,720	
Test 2 Low SPK	029B1101.D	0.0519	0.473	108	NA	38.2	1	92.0	3,514	
Test 3 Normal	031B1301.D	0.0519	0.473	108	NA	37.5	1	88.0	3,296	
Test 3 High SPK	044B0601.D	0.0519	0.473	108	NA	18.7	10	72.0	13,496	
Train Spike	043B0501.D	0.0519	0.473	108	NA	32.7	4	84.0	11,003	
								Spike Amount	10,080	
								Spike Recovery (%)	109%	
Field SPK - Low	034B1701.D	0.0519	0.473	108	NA	4.33	1	80.0	346	
								Spike Amount	310	
								Spike Recovery (%)	112%	
Field SPK - High	042B0401.D	0.0519	0.473	108	NA	30.2	4	86.0	10,374	
								Spike Amount	10,080	
								Spike Recovery (%)	103%	
BHA Blank	036B1901.D	0.0519	0.473	108	NA	0.208	1	66.0	13.7	J

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Acrolein

Client's Sample Name	Filename #1	MDL	Curve Min	Curve Max	Ret Time (min)	Conc #1 (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	026B0801.D	0.0535	0.499	113	NA	0.0535	1	86.0	4.60	ND
Test 1 DUP	027B0901.D	0.0535	0.499	113	NA	0.0535	1	125	6.69	ND
Test 2 Normal	028B1001.D	0.0535	0.499	113	NA	0.0535	1	88.0	4.71	ND
Test 2 Low SPK	029B1101.D	0.0535	0.499	113	NA	2.24	1	92.0	206	
Test 3 Normal	031B1301.D	0.0535	0.499	113	NA	0.0535	1	88.0	4.71	ND
Test 3 High SPK	044B0601.D	0.0535	0.499	113	NA	17.0	10	72.0	12,208	
Train Spike	043B0501.D	0.0535	0.499	113	NA	38.3	4	84.0	12,863	
								Spike Amount	13,050	
								Spike Recovery (%)	98.6%	
Field SPK - Low	034B1701.D	0.0535	0.499	113	NA	3.74	1	80.0	300	
								Spike Amount	310	
								Spike Recovery (%)	96.7%	
Field SPK - High	042B0401.D	0.0535	0.499	113	NA	35.5	4	86.0	12,197	
								Spike Amount	13,050	
								Spike Recovery (%)	93.5%	
BHA Blank	036B1901.D	0.0535	0.499	113	NA	0.206	1	66.0	13.6	J

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Formaldehyde

Client's Sample Name	Filename #1	MDL	Curve Min	Curve Max	Ret Time (min)	Conc #1 (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	026B0801.D	0.0485	0.485	110	8.11	0.126	1	86.0	10.8	J
Test 1 DUP	027B0901.D	0.0485	0.485	110	8.14	0.0760	1	125	9.50	J
Test 2 Normal	028B1001.D	0.0485	0.485	110	8.14	0.170	1	88.0	14.9	J
Test 2 Low SPK	029B1101.D	0.0485	0.485	110	8.12	2.95	1	92.0	272	
Test 3 Normal	031B1301.D	0.0485	0.485	110	8.14	0.233	1	88.0	20.5	J
Test 3 High SPK	032B1401.D	0.0485	0.485	110	8.11	93.7	1	72.0	6,744	
Train Spike	033B1501.D	0.0485	0.485	110	8.11	86.7	1	84.0	7,287	
								Spike Amount	7,077	
								Spike Recovery (%)	103%	
Field SPK - Low	034B1701.D	0.0485	0.485	110	8.12	3.77	1	80.0	301	
								Spike Amount	303	
								Spike Recovery (%)	99.3%	
Field SPK - High	035B1801.D	0.0485	0.485	110	8.11	83.5	1	86.0	7,177	
								Spike Amount	7,077	
								Spike Recovery (%)	101%	
BHA Blank	036B1901.D	0.0485	0.485	110	8.14	0.123	1	66.0	8.13	J

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Propionaldehyde

Client's Sample Name	Filename #1	MDL	Curve Min	Curve Max	Ret Time (min)	Conc #1 (ug/mL)	DF	Liquid Vol (mL)	Catch Weight (ug)	Flag
Test 1 Normal	026B0801.D	0.0593	0.482	110	NA	0.0872	1	86.0	7.50	J
Test 1 DUP	027B0901.D	0.0593	0.482	110	NA	0.0918	1	125	11.5	J
Test 2 Normal	028B1001.D	0.0593	0.482	110	NA	0.0780	1	88.0	6.86	J
Test 2 Low SPK	029B1101.D	0.0593	0.482	110	NA	2.88	1	92.0	265	
Test 3 Normal	031B1301.D	0.0593	0.482	110	NA	0.118	1	88.0	10.4	J
Test 3 High SPK	044B0601.D	0.0593	0.482	110	NA	18.9	10	72.0	13,614	
Train Spike	043B0501.D	0.0593	0.482	110	NA	42.3	4	84.0	14,202	
								Spike Amount	13,644	
								Spike Recovery (%)	104%	
Field SPK - Low	034B1701.D	0.0593	0.482	110	NA	4.52	1	80.0	361	
								Spike Amount	305	
								Spike Recovery (%)	118%	
Field SPK - High	042B0401.D	0.0593	0.482	110	NA	38.8	4	86.0	13,346	
								Spike Amount	13,644	
								Spike Recovery (%)	97.8%	
BHA Blank	036B1901.D	0.0593	0.482	110	NA	0.241	1	66.0	15.9	J

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

QC Samples

QC Type	QC Sample Name		Acetaldehyde	Acrolein	Formaldehyde	Propionaldehyde
Spiked Blank Solvent	gcprep5570 #LCS-L-HEX	catch (ug)	313	281	298	302
	spiked:	spike (ug)	310	310	303	305
	spikeprep2042.SP-LOW * 100uL	recovery	101%	90.8%	98.4%	99.1%
Spiked Blank Solvent	gcprep5570 #LCS-H-HEX	catch (ug)	10,601	12,619	7,371	13,708
	spiked:	spike (ug)	10,080	13,050	7,077	13,644
	spikeprep2042.SP-HIGH * 1000uL	recovery	105%	96.7%	104%	100%
Lab Dup	LD / Test 2 Low SPK	ug/mL	37.9	2.23	2.93	2.89
	Test 2 Low SPK	ug/mL	38.2	2.24	2.95	2.88
		RD	0.8%	0.3%	0.6%	0.3%
Blank Solvent	gcprep5570 #MB-HEX	ug/mL	0.132	0.204	0.0820	0.211

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Spike and Recovery Calculations

Analyte: Acetaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	346	Spiked Train		3,514	96.244	250%
		Un-spiked Train		2,720	98.778	

Analyte: Acetaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	10,374	Spiked Train		13,496	103.832	99.1%
		Un-spiked Train		3,296	106.568	

Analyte: Acrolein

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	300	Spiked Train		206	96.244	68.8%
		Un-spiked Train	ND	4.71	98.778	

Analyte: Acrolein

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	12,197	Spiked Train		12,208	103.832	100%
		Un-spiked Train	ND	4.71	106.568	

Analyte: Formaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	301	Spiked Train		272	96.244	85.4%
		Un-spiked Train	J	14.9	98.778	

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Spike and Recovery Calculations

Analyte: Formaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	7,177	Spiked Train		6,744	103.832	93.7%
		Un-spiked Train	J	20.5	106.568	

Analyte: Propionaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 2	361	Spiked Train		265	96.244	71.6%
		Un-spiked Train	J	6.86	98.778	

Analyte: Propionaldehyde

	Spike Amount		Flag	Catch (ug)	Sample Volume	Recovery (%)
Test 3	13,346	Spiked Train		13,614	103.832	102%
		Un-spiked Train	J	10.4	106.568	

Enthalpy Analytical

Company: Advanced Industrial Resources

Job No.: 0623-263 - NCASI A105.01 (GC/NPD) Analysis

Client No.: KR11456 Site: GP-Juno Toledo, OR

Duplicate % Difference Calculations

Analyte: Acetaldehyde

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train		1,772	108.425	193%
	Duplicate Train	J	29.5	106.298	

Analyte: Acrolein

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train	ND	4.60	108.425	NA
	Duplicate Train	ND	6.69	106.298	

Analyte: Formaldehyde

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train	J	10.8	108.425	10.9%
	Duplicate Train	J	9.50	106.298	

Analyte: Propionaldehyde

		Flag	Catch (ug)	Sample Volume	Difference (%)
Test 1	Sample Train	J	7.50	108.425	43.8%
	Duplicate Train	J	11.5	106.298	

Narrative Summary

Enthalpy Analytical Narrative Summary

Company Job No. Client ID.	Advanced Industrial Resources 0623-263 NCASI Method A105.01 KR11456 Site: GP – Juno Toledo, OR

Custody	Alyssa Miller received the samples on 7/14/23 at 4.6 ºC after being relinquished by Advanced Industrial Resources. The samples were received in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.

Analysis	The samples were analyzed for methanol, phenol, acetaldehyde, acrolein, formaldehyde, and propionaldehyde using the analytical procedures in NCASI Method ISS/FP-A105.01, “Impinger Source Sampling Method for Selected Aldehydes, Ketones, and Polar Compounds”. The initial volumes of the combined aqueous BHA/hexane samples were measured. The combined samples were transferred to separatory funnels for the first extraction. The samples were shaken for 30 seconds and the hexane and BHA layers allowed to separate. Two additional extractions were performed by adding fresh hexane to the aqueous BHA samples in the separatory funnels, shaking for 30 seconds and allowing the hexane layers to separate. The hexane extracts were combined for each sample. The final hexane and BHA volumes were measured and recorded. The Gas Chromatograph "Lolita" was used for the analyses of the hexane extract fractions for acetaldehyde, acrolein, formaldehyde, and propionaldehyde. The Gas Chromatograph "Fester" was used for the analyses of the aqueous BHA fractions for methanol and phenol.

Calibration	The calibration curves are located in the back of this report. For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.

Chrom. Conditions	The acquisition methods (FESTER0258.M and LOLITA0349X.M) may be made available upon request.

Enthalpy Analytical Narrative Summary

Company	Advanced Industrial Resources
Job No.	0623-263 NCASI Method A105.01
Client ID.	KR11456 Site: GP – Juno Toledo, OR

QC Notes	Methanol, phenol were not present at concentrations above their MDL value in the analysis of the client's Field Blank. While acetaldehyde, acrolein, formaldehyde, and propionaldehyde were present at concentrations greater than their MDL value, but below their LOQ value. Phenol, acetaldehyde, acrolein, formaldehyde, and propionaldehyde were present at concentrations greater than MDL value, but below the LOQ in the analysis of the laboratory method blank. Methanol was not present at concentration greater than the MDL in the analysis of the method blank. Laboratory Duplicates (LD) were prepared and analyzed with the samples using aliquots of sample ***Test 2 Low Spike***. The percent difference values were 12.1% or less. The laboratory prepared eight ***Low*** aqueous spike solutions containing 435 µg/mL of methanol (plus an additional 78.0 µg/mL of methanol from formaldeyde) , 498 µg/mL of phenol, 310 µg/mL of of acetaldehyde, 310 µg/mL of acrolein, 303 µg/mL of formaldehyde, and 305 µg/mL of propionaldehyde. The The laboratory also prepared five ***High*** aqueous spike solutions containing 5,536 µg/mL of methanol (plus an additional 1,818 µg/mL of methanol from formaldeyde) , 22,198 µg/mL of phenol, 10,080 µg/mL of of acetaldehyde, 13,050 µg/mL of acrolein, 7,077 µg/mL of formaldehyde, and 13,644 µg/mL of propionaldehyde. Two vials (of each level) of the spike solution were provided to the client prior to sample collection while two were retained by the lab to be analyzed as Laboratory Control Samples (LCS). The lab prepared, extracted, and analyzed a LCS from each level, with the samples, and yielded recovery values between 90.8% and 105%.

Reporting Notes	Acetaldehyde, acrolein, and propionaldehyde are identified as two peaks ("1" and "2"). This is normal for the method's derivatization process, and results for both peaks are combined on the chromatograms and the results pages. Only the total results are included on the results tables. A fresh aliquot of samples ***Run 1 Duplicate***, ***Run 2 Low Spike***, and ***Field Spike -Low*** were analyzed for methanol and phenol, confirming the original results. Only the original data is included in this report. A fresh aliquot of samples ***Run 1 Duplicate***, ***Run 2***, ***Run 2 Low Spike***, and ***Blank*** were analyzed for acetaldehyde, acrolein, formaldehyde, and propionaldehyde, confirming the original results. Only the original data is included in this report.

Enthalpy Analytical Narrative Summary

Company	Advanced Industrial Resources
Job No.	0623-263 NCASI Method A105.01
Client ID.	KR11456 Site: GP – Juno Toledo, OR

Reporting Notes (Continued)	These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above. The results presented in this report are representative of the samples as provided to the laboratory.

General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC data reports, unless specifically noted otherwise.

- Any analysis which refers to the method as ***"Type"*** represents a planned deviation from the reference method. For instance a Hydrogen Sulfide assay from a Tedlar bag would be labeled as "EPA Method 16-Type" because Tedlar bags are not mentioned as one of the collection options in EPA Method 16.

- The acronym ***MDL*** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.

- The acronym ***LOQ*** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.

- The acronym ***ND*** following a value indicates a non-detect or analytical result below the MDL.

- The letter ***J*** in the Qualifier or Flag column in the results indicates that the value is between the MDL and the LOQ. The laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.

- The letter ***E*** in the Qualifier or Flag column indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.

- Sample results are presented 'as measured' for single injection methodologies, or an average value if multiple injections are made. If all injections are below the MDL, the sample is considered non-detect and the ND value is presented. If one, but not all, are below the MDL, the MDL value is used for any injections that are below the MDL. For example, if the MDL is 0.500 and LOQ is 1.00, and the instrument measures 0.355, 0.620, and 0.442 - the result reported is the average of 0.500, 0.620, and 0.500 - - - i.e. 0.540 with a J flag.

- When a spike recovery (Bag Spike, Collocated Spike Train, or liquid matrix spike) is being calculated, the native (unspiked) sample result is used in the calculations, as long as the value is above the MDL. If a sample is ND, then 0 is used as the native amount (not the MDL value).

- The acronym ***DF*** represents Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.

- The addition of ***MS*** to the Sample ID represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. The MS analysis indicates what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix interferes with the analysis of the analyte(s).

General Reporting Notes
(continued)

- The addition of ***MSD*** to the Sample ID represents a Matrix Spike Duplicate. Prepared in the same manner as a MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times.

- The addition of ***LD*** to the Sample ID represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results of the duplicate analysis are compared to the initial result. The result should have a difference value of within 10% of the initial result (if the results of the original analysis are greater than the LOQ).

- The addition of ***AD*** to the Sample ID represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.

- The Sample ID ***LCS*** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our client projects, two spikes are retained as LCSs. The LCSs are labeled with the associated project number and kept in-house at the appropriate temperature conditions. When the project samples are received for analysis, the LCSs are analyzed to confirm that the analyte could be recovered from the media, separate from the samples which were used on the project and which may have been affected by source matrix, sample collection, and/or sample transport.

- **Significant Figures**: Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units, rather than to 3 significant figures. For example, a value of 10,456.45 ug catch is rounded to 10,456 ug. There are five significant digits displayed, but no confidence should be placed on more than two significant digits. In the case of small numbers, generally 3 significant figures are presented, but still only 2 should be used with confidence. Many neat materials are only certified to 3 digits, and as the mathematically correct final result is always 1 digit less than all its pre-cursors - 2 significant figures are what are most defensible.

- **Manual Integration**: The data systems used for processing will flag manually integrated peaks with an "M". There are several reasons a peak may be manually integrated. These reasons will be identified by the following two letter designations on sample chromatograms, if provided in the report. The peak was ***not integrated*** by the software **"NI"**, the peak was ***integrated incorrectly*** by the software **"II"** or the ***wrong peak*** was integrated by the software **"WP"**. These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.

Sample Custody

Advanced Industrial Resources, Inc.
Compliance Sample Custody Record

Client: GP
Juno Toledo, OR

Sample ID		Date	Source	Description	Matrix	Analysis Desired: Method 105.01				Sample Condition	Comments
KR11456	1	7/12/2023	Carbon Bed Outlet	Test 1 Normal	M5	x					
KR11456	2	7/12/2023	Carbon Bed Outlet	Test 1 Duplicate	M5	x					
KR11456	3	7/12/2023	Carbon Bed Outlet	Test 2 Normal	M5	x					
KR11456	4	7/12/2023	Carbon Bed Outlet	Test 2 Low Spike	M5	x					
KR11456	5	7/12/2023	Carbon Bed Outlet	Test 3 Normal	M5	x					
KR11456	6	7/12/2023	Carbon Bed Outlet	Test 3 High Spike	M5	x					
KR11456	7	7/12/2023	Carbon Bed Outlet	Train Spike	M6	x					
KR11456	8	7/12/2023	Carbon Bed Outlet	Filed Spike Low	M7	x					
KR11456	9	7/12/2023	Carbon Bed Outlet	Filed Spike High	M8	x					
KR11456	10	7/12/2023	Carbon Bed Outlet	BHA Blank	M9	x					

Relinquished By/Sign:	Date/Time	Received By / Sign:	Relinquished By / Sign:	Date/Time	Received By / Sign:
		Alyssa Mueller 07.14.23 ~~0930~~ 0930			

Field Team Members: DJK
AIR Field Supervisor: Dan Kirk
Field Supervisor Sign:
AIR Contact Name: Derek Stephens
AIR Contact Number: (404) 843-2100

Analyses To Be Performed By: Enthalpy

07.14.23

4.6°C Raytek 2
good condition
AMM 07.14.23

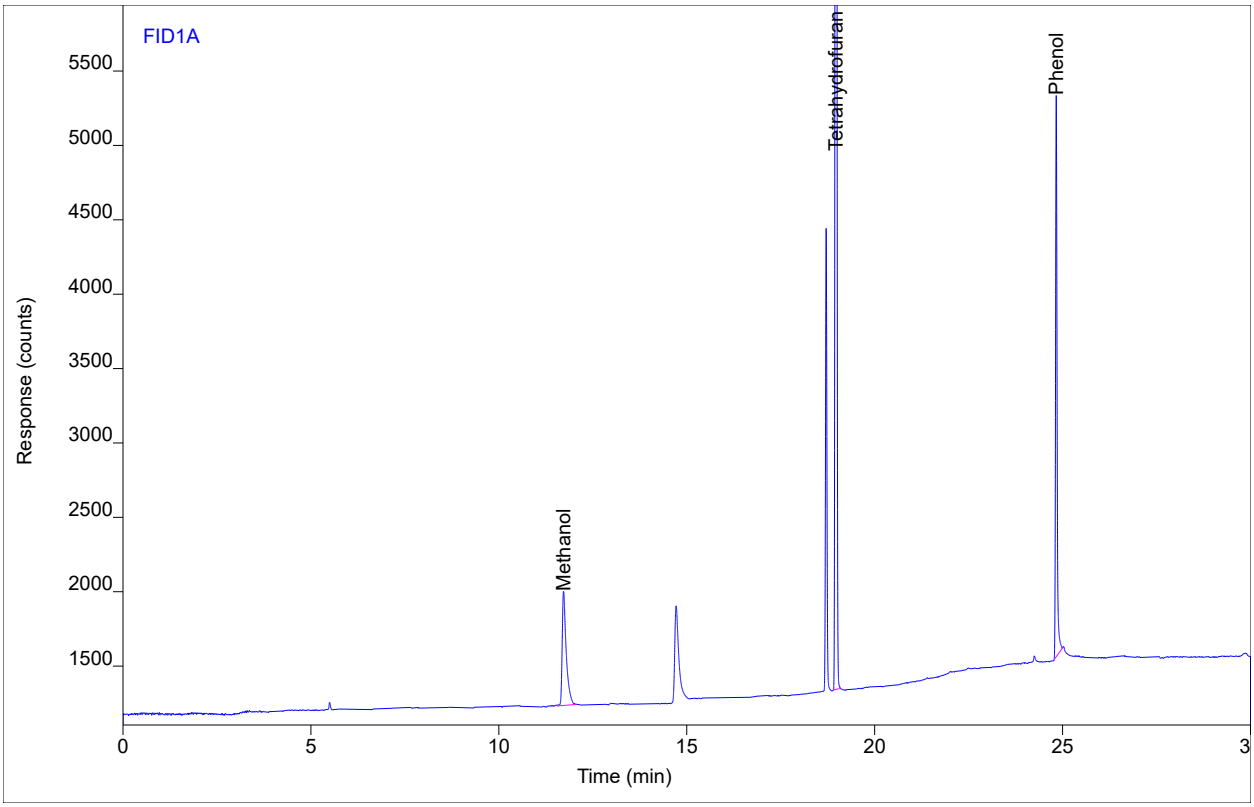
Raw Data

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0836A ver.7
Inj Data File	010F0101.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 2:25 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	10
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



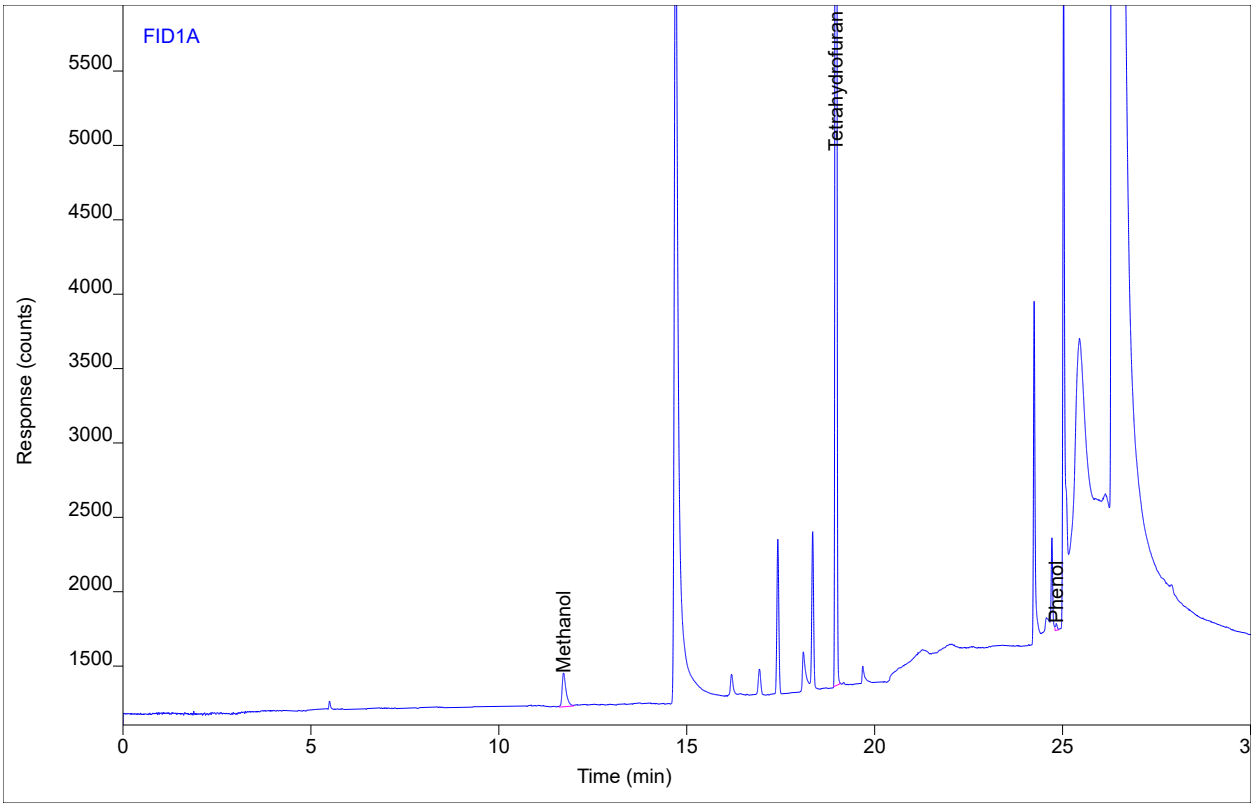
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.72	5741.96	771.254	22.9728	1	22.9728	ug/mL
Tetrahydrofuran	I BB	18.97	52837.6	20364.3	149.190			ug/mL
Phenol	BB	24.83	10453.0	3770.91	24.6150	1	24.6150	ug/mL

Chromatogram Report

Sample Name	0623-263.R1.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	001F0201.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 3:47 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	1
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



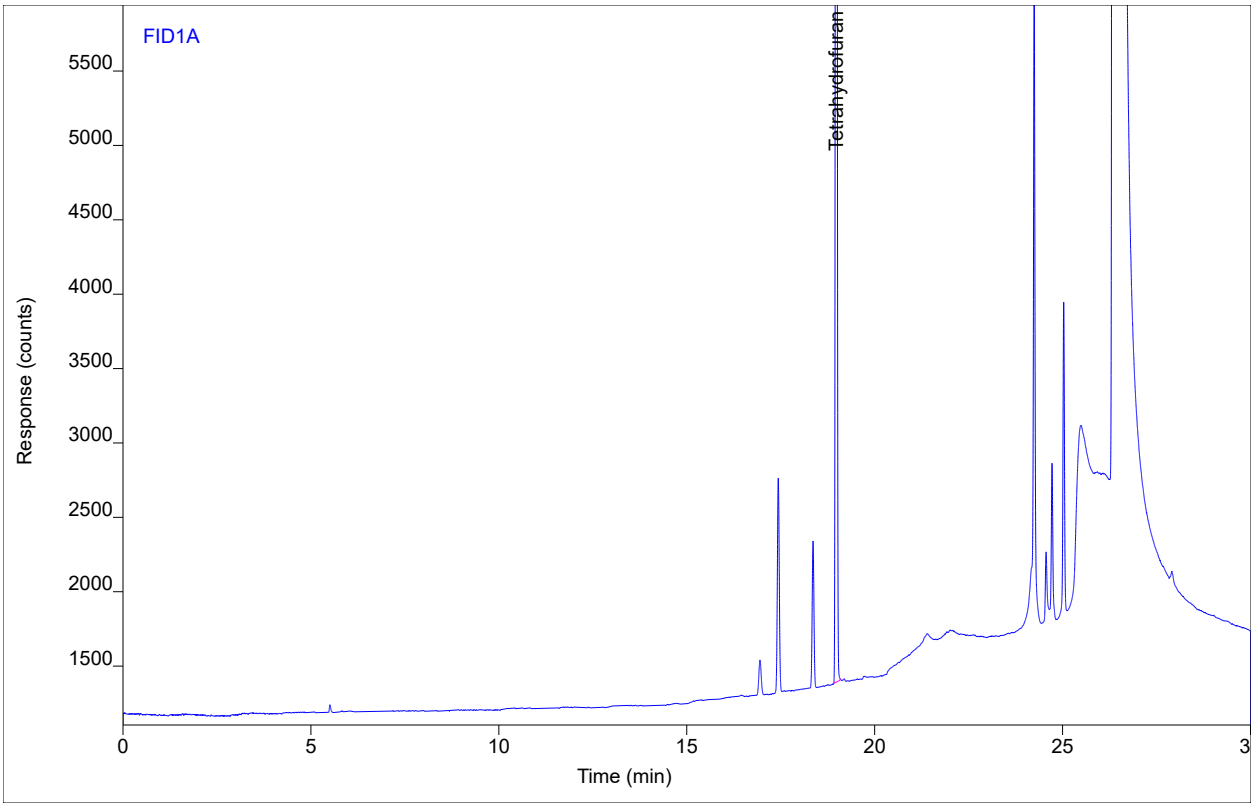
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.72	1662.62	230.041	6.08398	1	6.08398	ug/mL
Tetrahydrofuran	I BB	18.97	57769.9	22570.9	149.190			ug/mL
Phenol	VV	24.83	143.766	48.5387	0.30964	1	0.30964	ug/mL

Chromatogram Report

Sample Name	0623-263.R1-DUP.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	002F0301.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 4:23 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	2
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



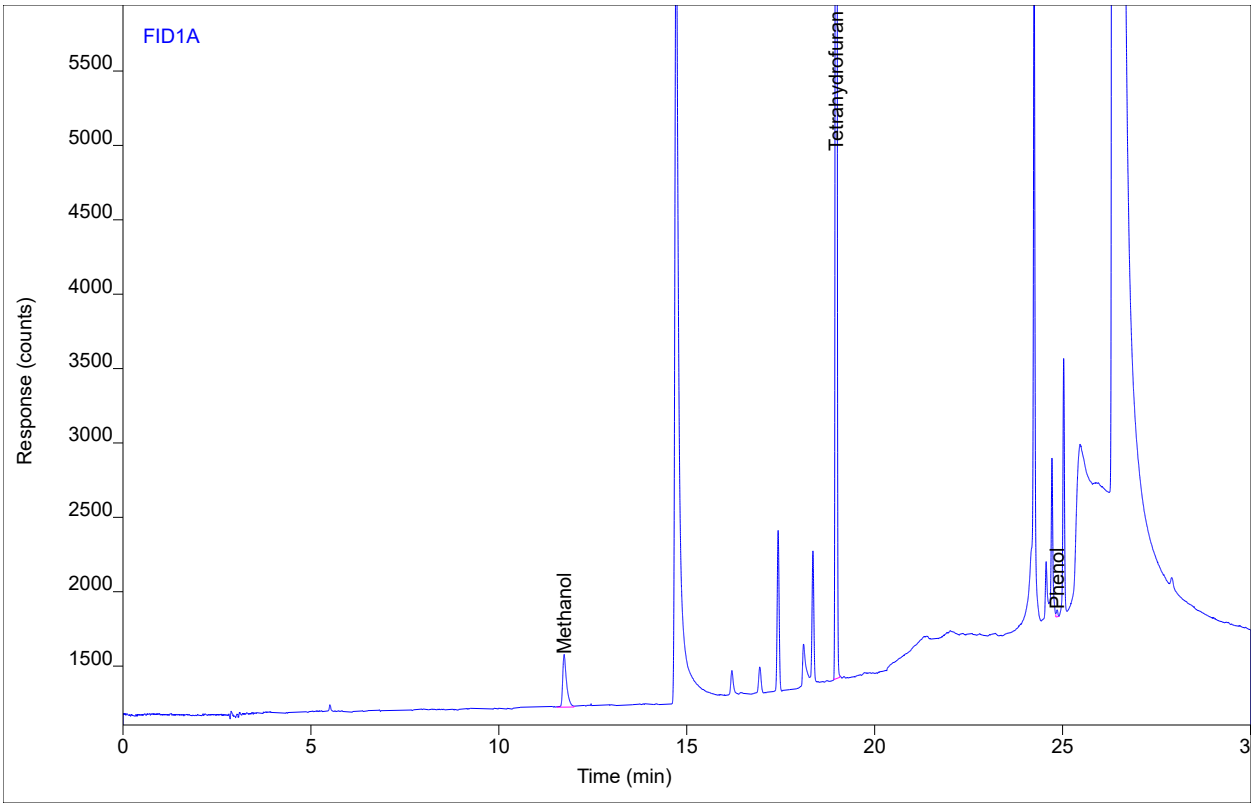
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol		(11.74)				1		ug/mL
Tetrahydrofuran	I BB	18.98	54734.1	21330.7	149.190			ug/mL
Phenol		(24.86)				1		ug/mL

Chromatogram Report

Sample Name	0623-263.R2.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	003F0401.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 4:58 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	3
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



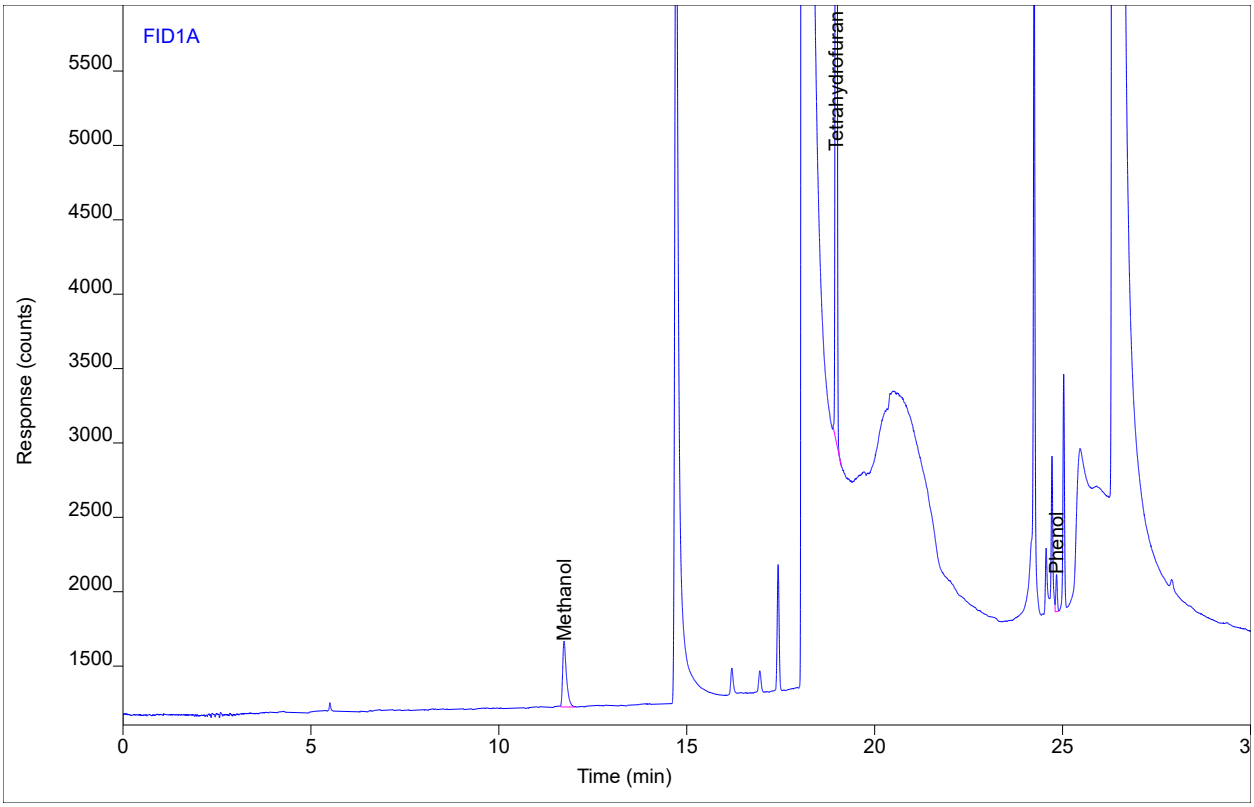
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.74	2533.74	352.876	9.85870	1	9.85870	ug/mL
Tetrahydrofuran	I BB	18.98	54329.8	21159.7	149.190			ug/mL
Phenol	VV	24.86	133.503	50.0549	0.30574	1	0.30574	ug/mL

Chromatogram Report

Sample Name	0623-263.R2-L-SPK.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	004F0501.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 5:34 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	4
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



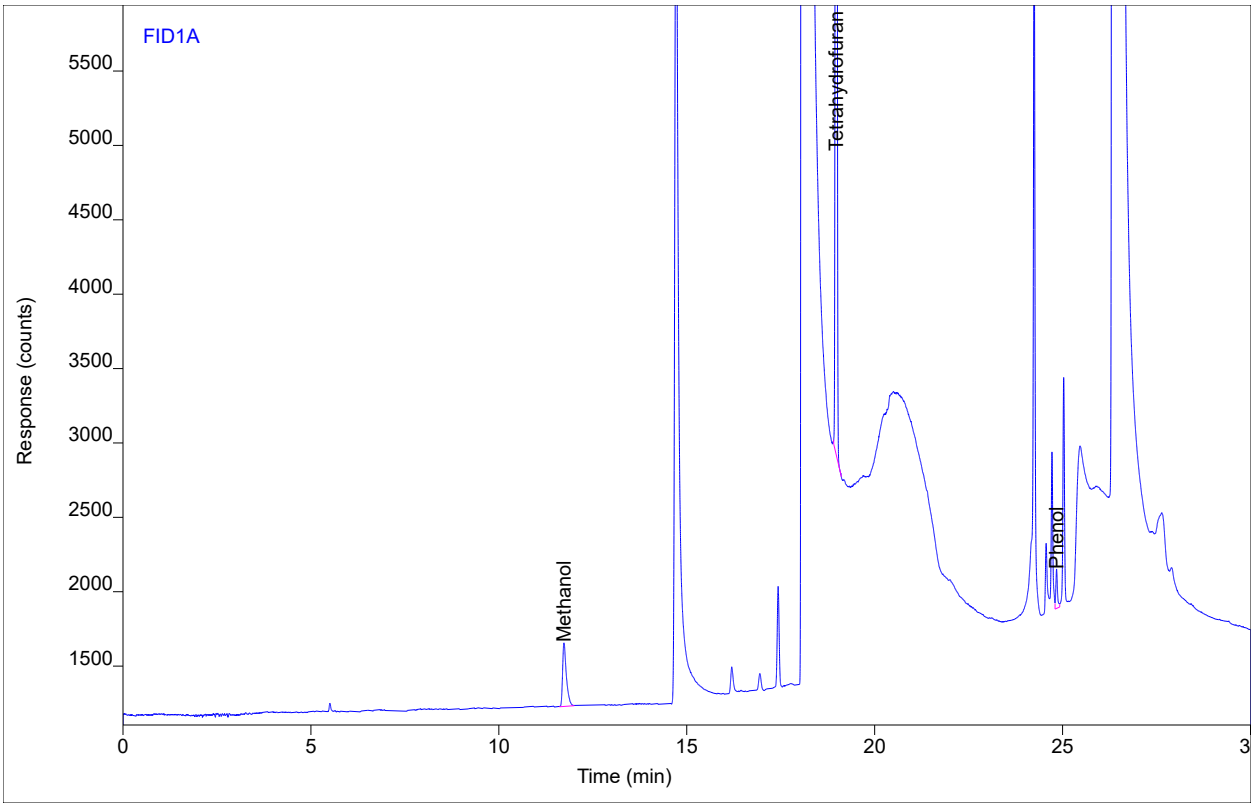
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BV	11.74	3111.19	442.125	12.1495	1	12.1495	ug/mL
Tetrahydrofuran	I BB	18.98	54133.6	21310.1	149.190			ug/mL
Phenol	VV	24.84	694.468	251.438	1.59621	1	1.59621	ug/mL

Chromatogram Report

Sample Name	0623-263.R2-L-SPK-LD.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	005F0601.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 6:10 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	5
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



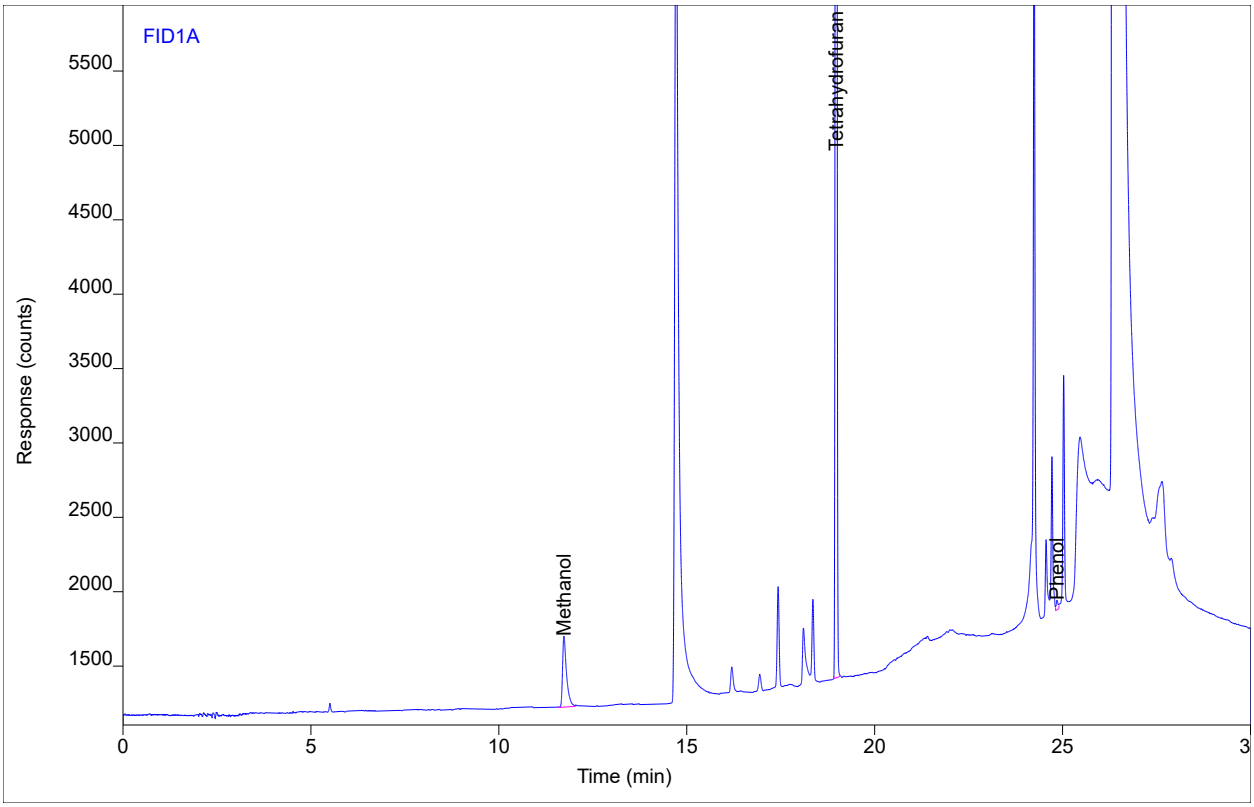
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.73	2986.35	430.231	11.4701	1	11.4701	ug/mL
Tetrahydrofuran	I BB	18.98	55038.7	21674.5	149.190			ug/mL
Phenol	VV	24.84	797.270	265.926	1.80235	1	1.80235	ug/mL

Chromatogram Report

Sample Name	0623-263.R3.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	006F0701.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 6:45 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	6
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



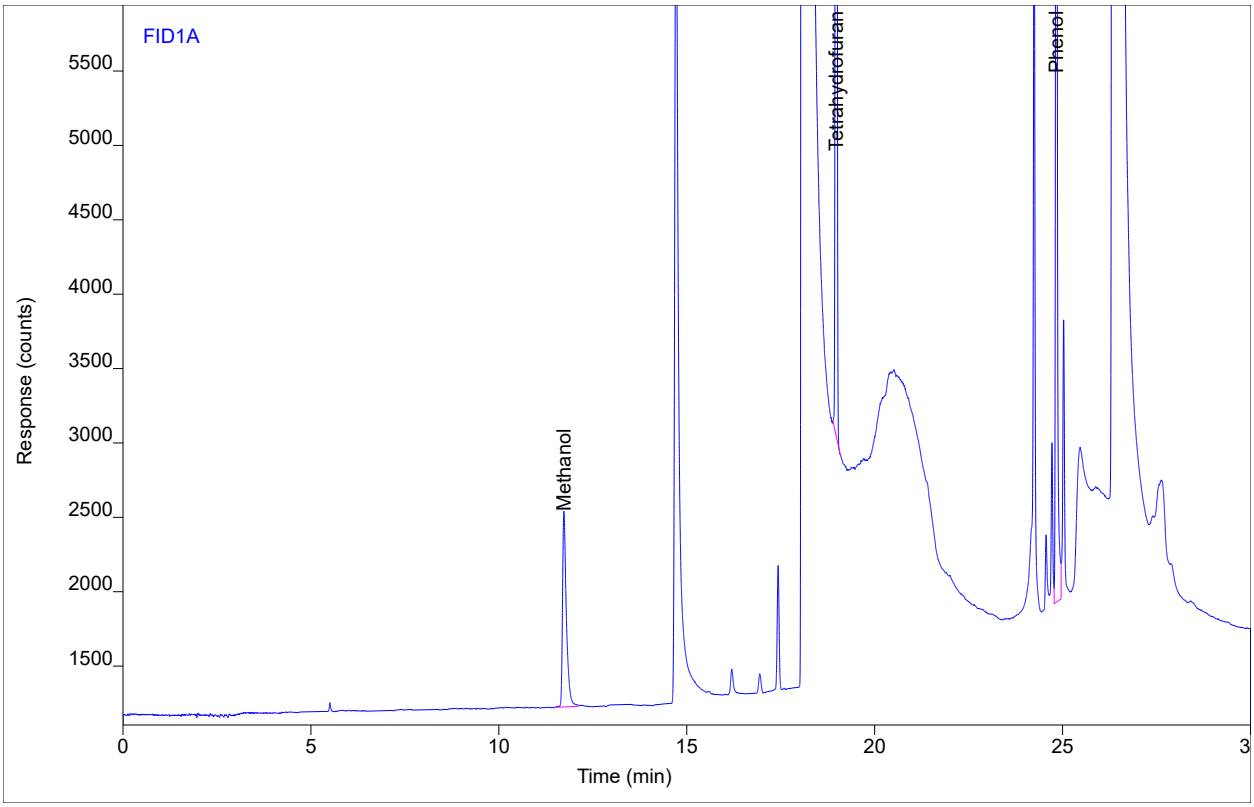
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BV	11.73	3533.14	478.652	13.8668	1	13.8668	ug/mL
Tetrahydrofuran	I BB	18.97	53861.9	20974.0	149.190			ug/mL
Phenol	VV	24.85	225.267	67.5792	0.52038	1	0.52038	ug/mL

Chromatogram Report

Sample Name	0623-263.R3-H-SPK.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	007F0801.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 7:21 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	7
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



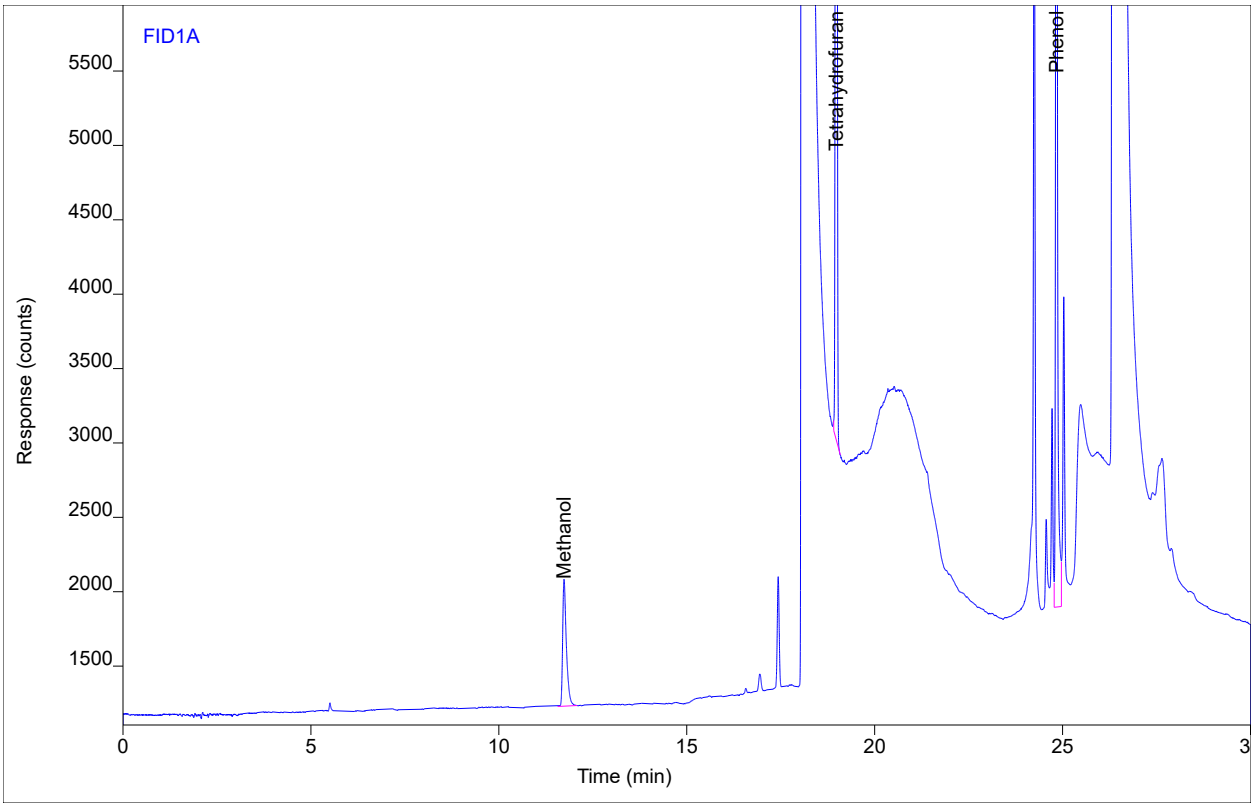
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.73	9318.96	1316.00	36.6038	1	36.6038	ug/mL
Tetrahydrofuran	I BB	18.98	53819.3	21264.0	149.190			ug/mL
Phenol	VV	24.83	32285.4	11524.6	74.6399	1	74.6399	ug/mL

Chromatogram Report

Sample Name	0623-263.TS.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	008F0901.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 7:57 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	8
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



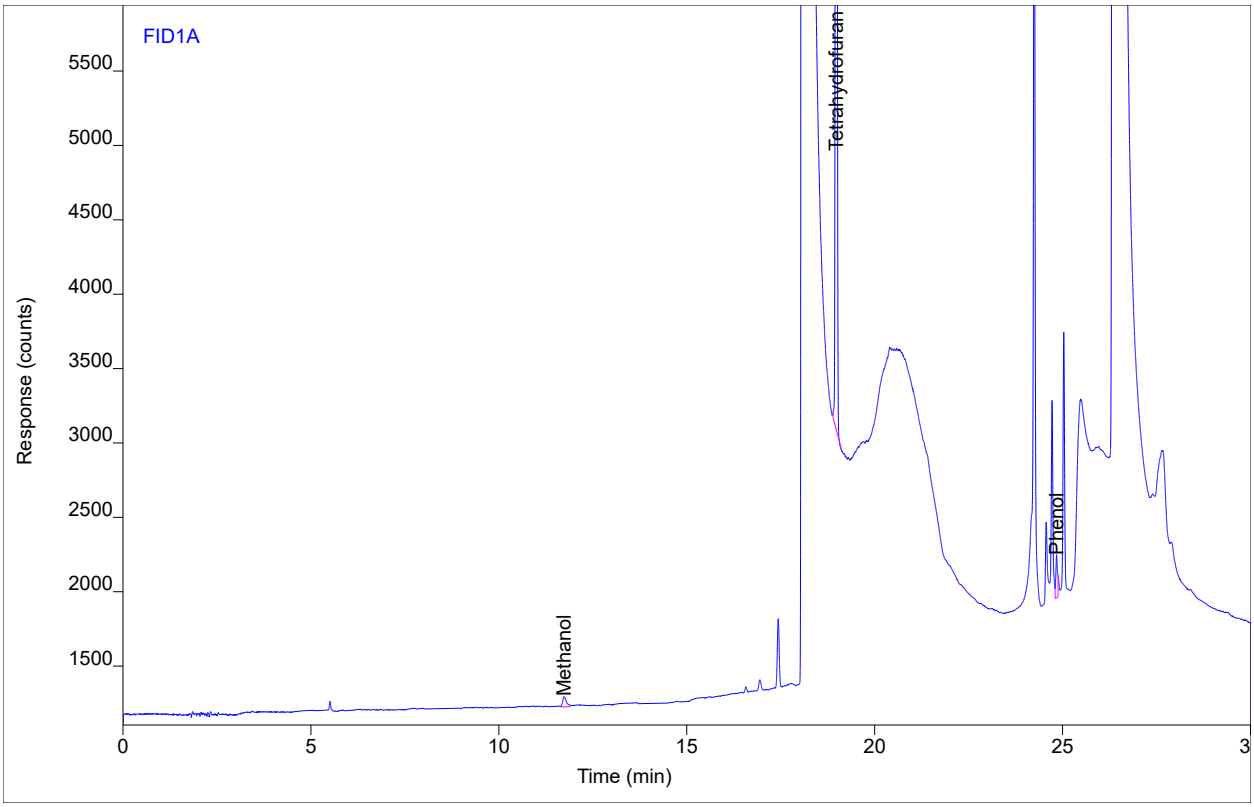
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.74	5866.22	857.295	22.5168	1	22.5168	ug/mL
Tetrahydrofuran	I BB	18.98	55074.2	21665.4	149.190			ug/mL
Phenol	VV	24.84	33203.6	11415.8	75.0136	1	75.0136	ug/mL

Chromatogram Report

Sample Name	0623-263.F-L-SPK.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	009F1001.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 8:33 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	9
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VV	11.73	486.655	69.9263	1.93778	1	1.93778	ug/mL
Tetrahydrofuran	I BB	18.98	53090.2	20972.2	149.190			ug/mL
Phenol	MF	24.84	866.109	285.959	2.02984	1	2.02984	ug/mL

Analyst Peak Integration Comments

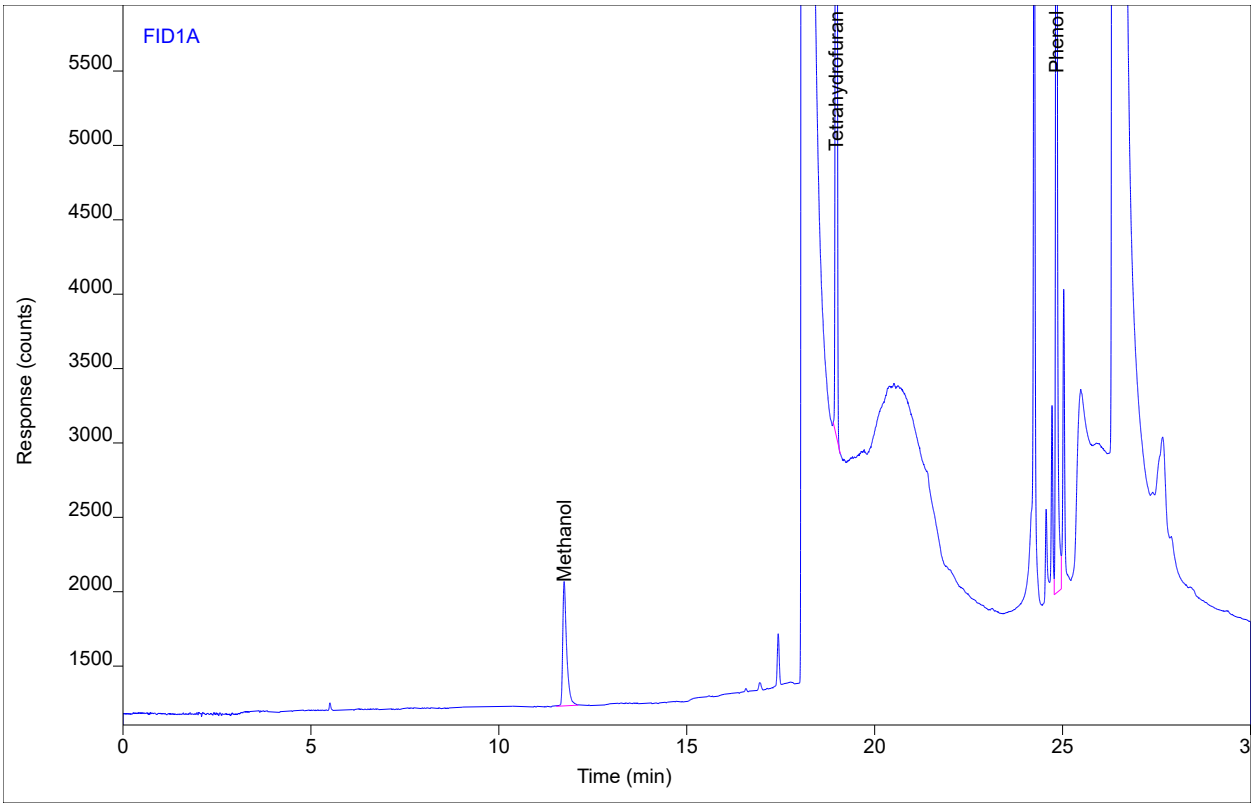
13:58:52 07/26/23 Remington Heathcoat ii

Chromatogram Report

Sample Name	0623-263.F-H-SPK.BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	011F1101.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 9:09 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	11
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



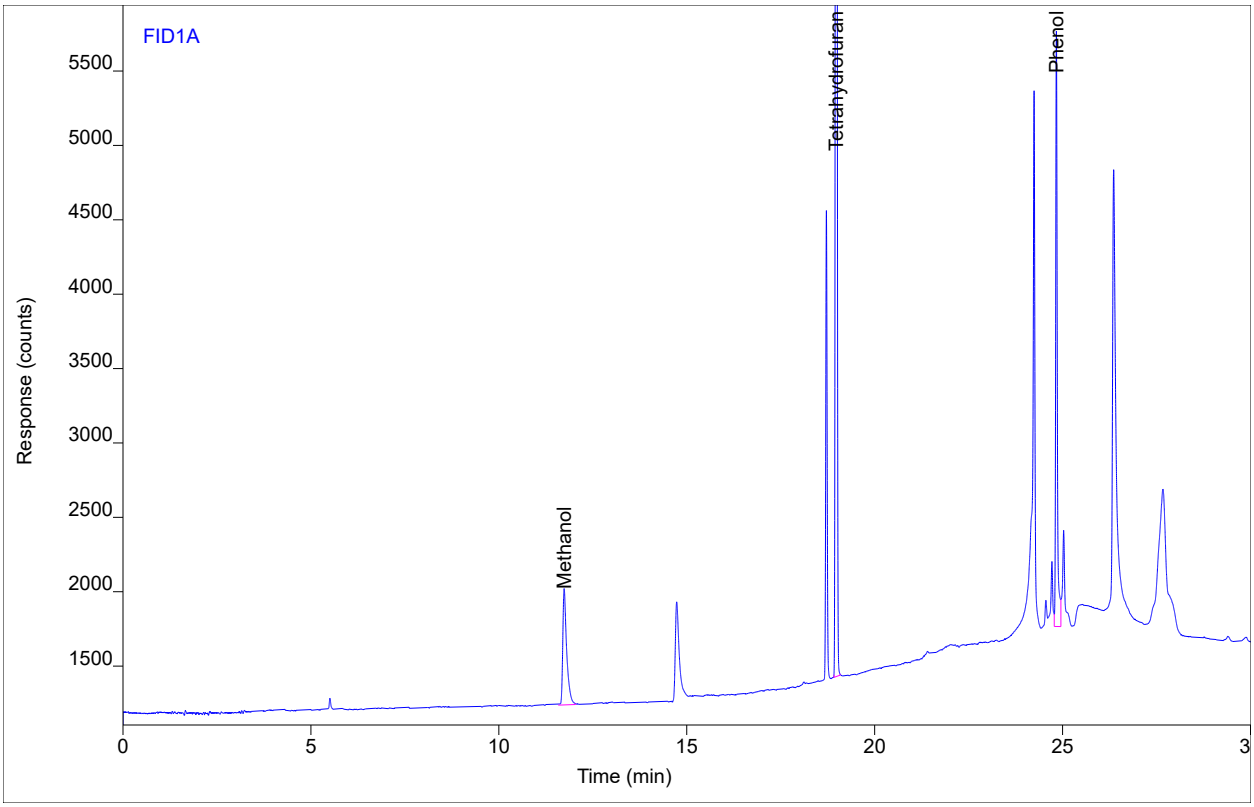
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BV	11.74	6051.69	835.597	22.5884	1	22.5884	ug/mL
Tetrahydrofuran	I BB	18.98	56635.4	22344.2	149.190			ug/mL
Phenol	VV	24.84	32219.6	11399.1	70.7840	1	70.7840	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0836A ver.7
Inj Data File	010F1301.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 10:21 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	10
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



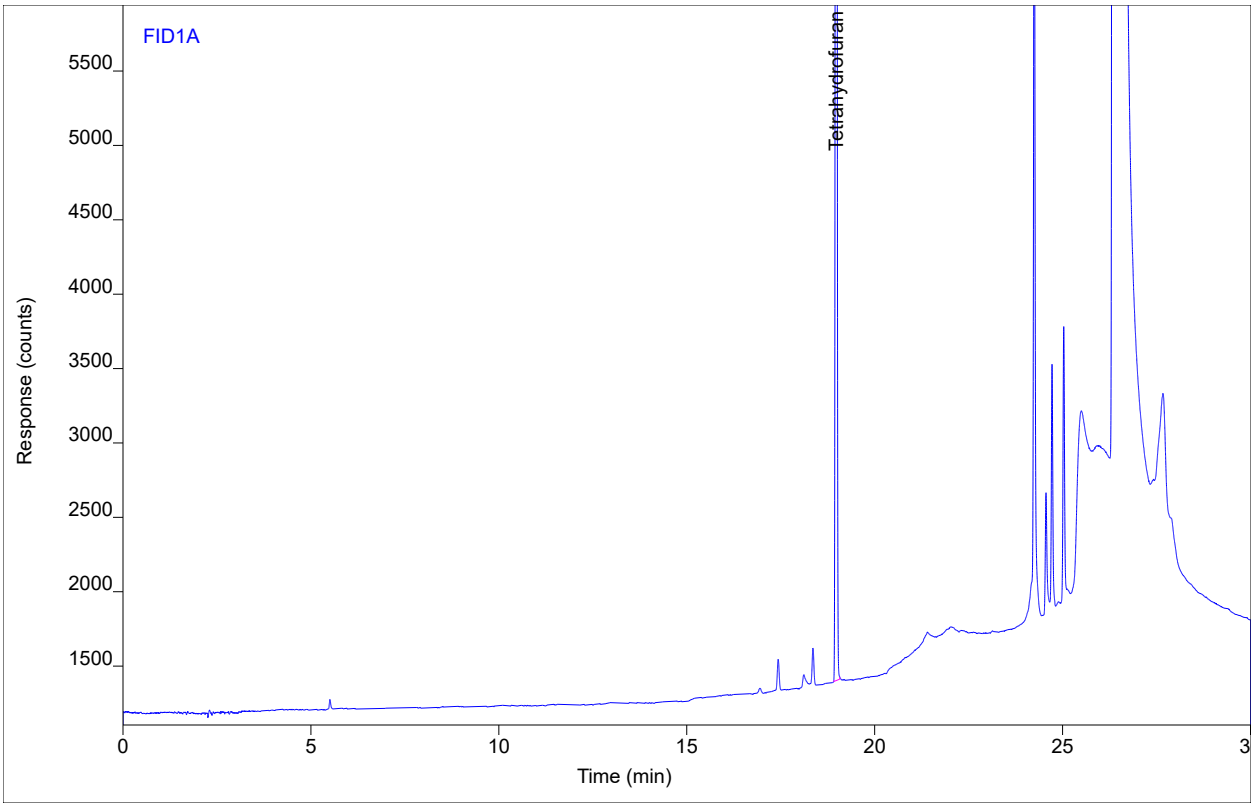
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.74	5660.89	782.540	22.6671	1	22.6671	ug/mL
Tetrahydrofuran	I BB	18.98	52794.0	20502.1	149.190			ug/mL
Phenol	VV	24.84	11698.8	3995.01	27.5716	1	27.5716	ug/mL

Chromatogram Report

Sample Name	gcprep5570 #MB-BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	013F1401.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 10:57 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	13
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



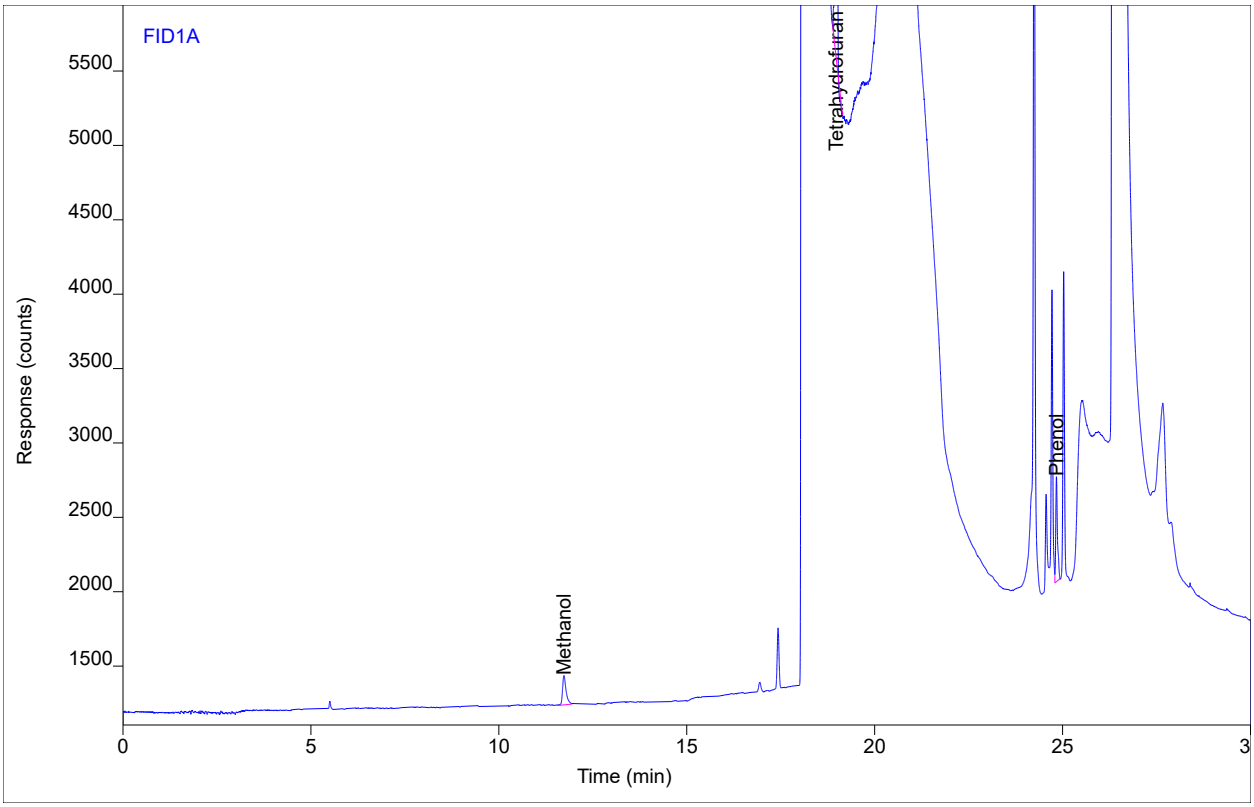
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol		(11.74)				1		ug/mL
Tetrahydrofuran	I BB	18.98	55273.1	21626.8	149.190			ug/mL
Phenol		(24.86)				1		ug/mL

Chromatogram Report

Sample Name	gcprep5570 #LCS-L-BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	014F1501.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/18/2023 11:33 PM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	14
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VV	11.73	1296.53	196.489	5.24125	1	5.24125	ug/mL
Tetrahydrofuran	I BB	18.98	52293.2	20558.2	149.190			ug/mL
Phenol	FM	24.84	2209.82	712.517	5.25793	1	5.25793	ug/mL

Analyst Peak Integration Comments

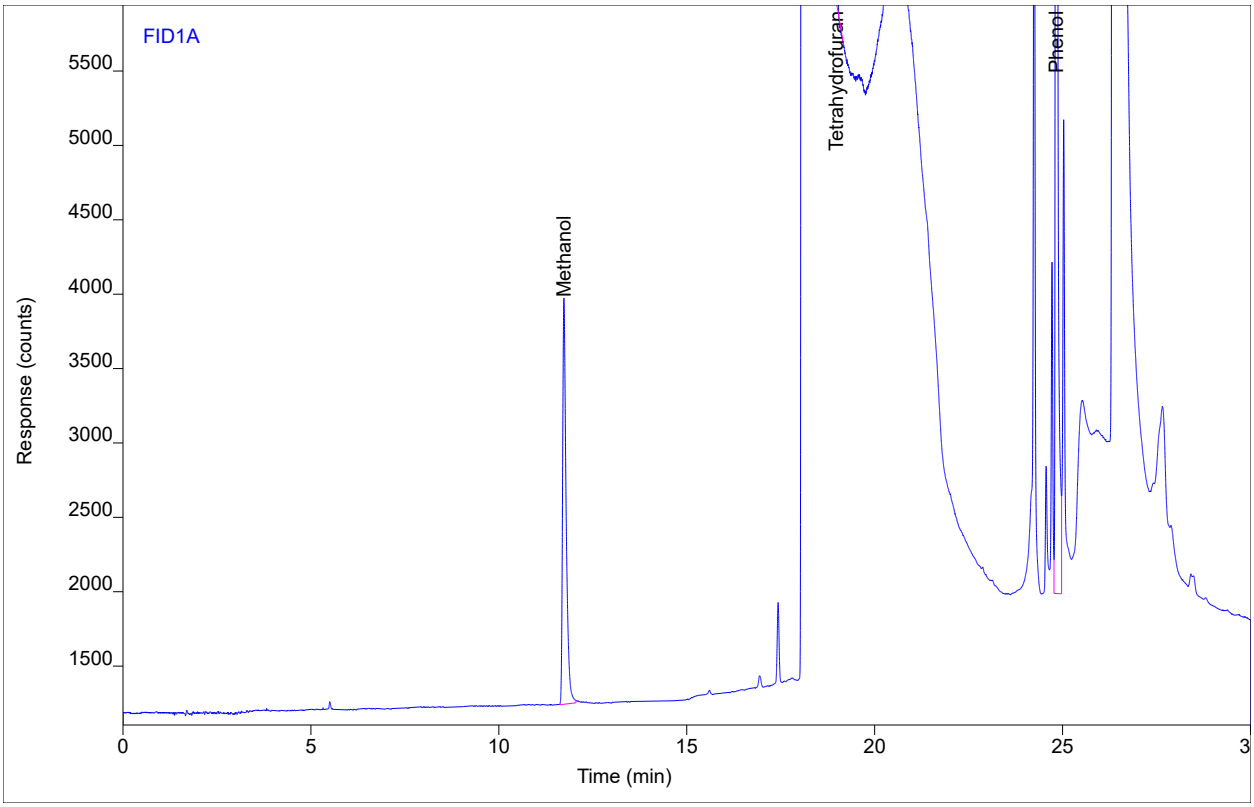
11:26:19 07/19/23 Remington Heathcoat ii

Chromatogram Report

Sample Name	gcprep5570 #LCS-H-BHA
Sequence Name	FESTER0836A ver.7
Inj Data File	015F1601.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/19/2023 12:09 AM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	15
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



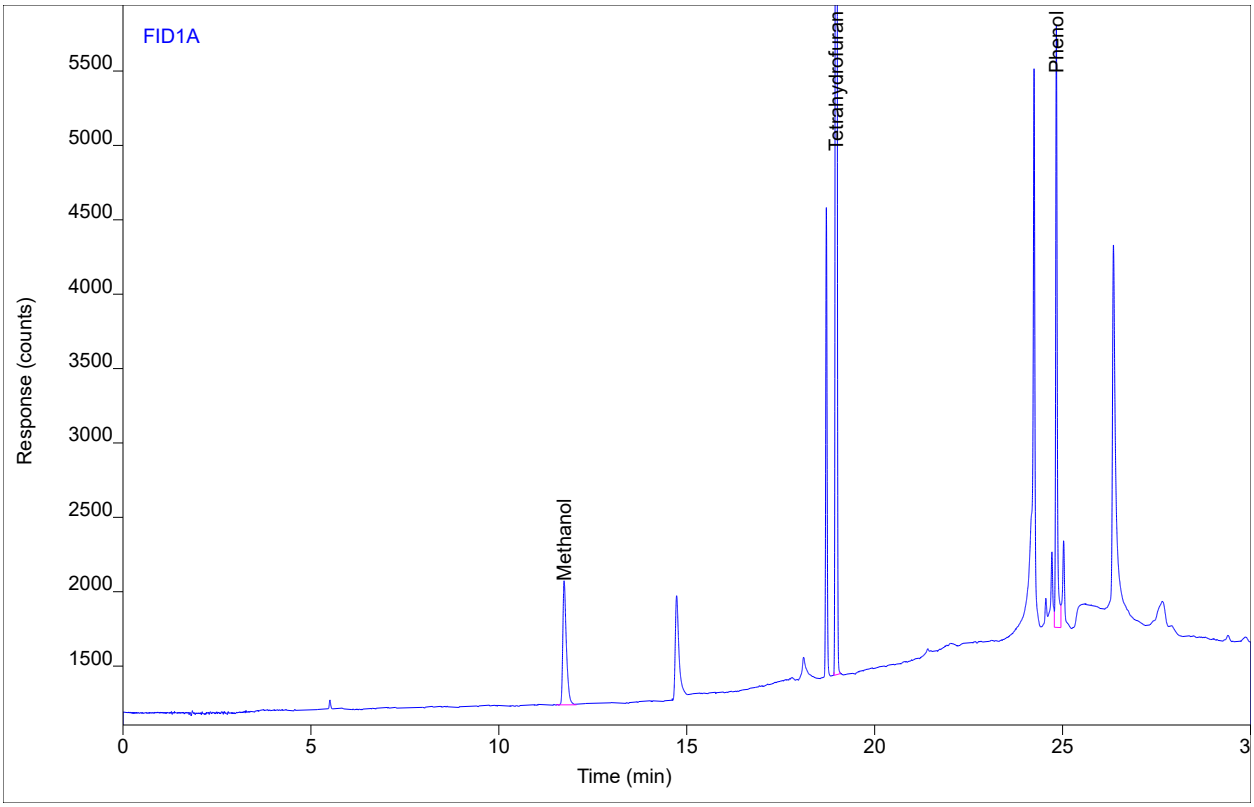
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BV	11.73	17999.6	2733.63	71.5369	1	71.5369	ug/mL
Tetrahydrofuran	I BB	18.98	53190.0	20770.6	149.190			ug/mL
Phenol	VV	24.84	98008.5	34610.3	229.265	1	229.265	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0836A ver.7
Inj Data File	010F1701.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/19/2023 12:45 AM
File Modified	7/26/2023 2:09 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	10
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/19/2023 10:01 AM
Printed	7/26/2023 3:40 PM



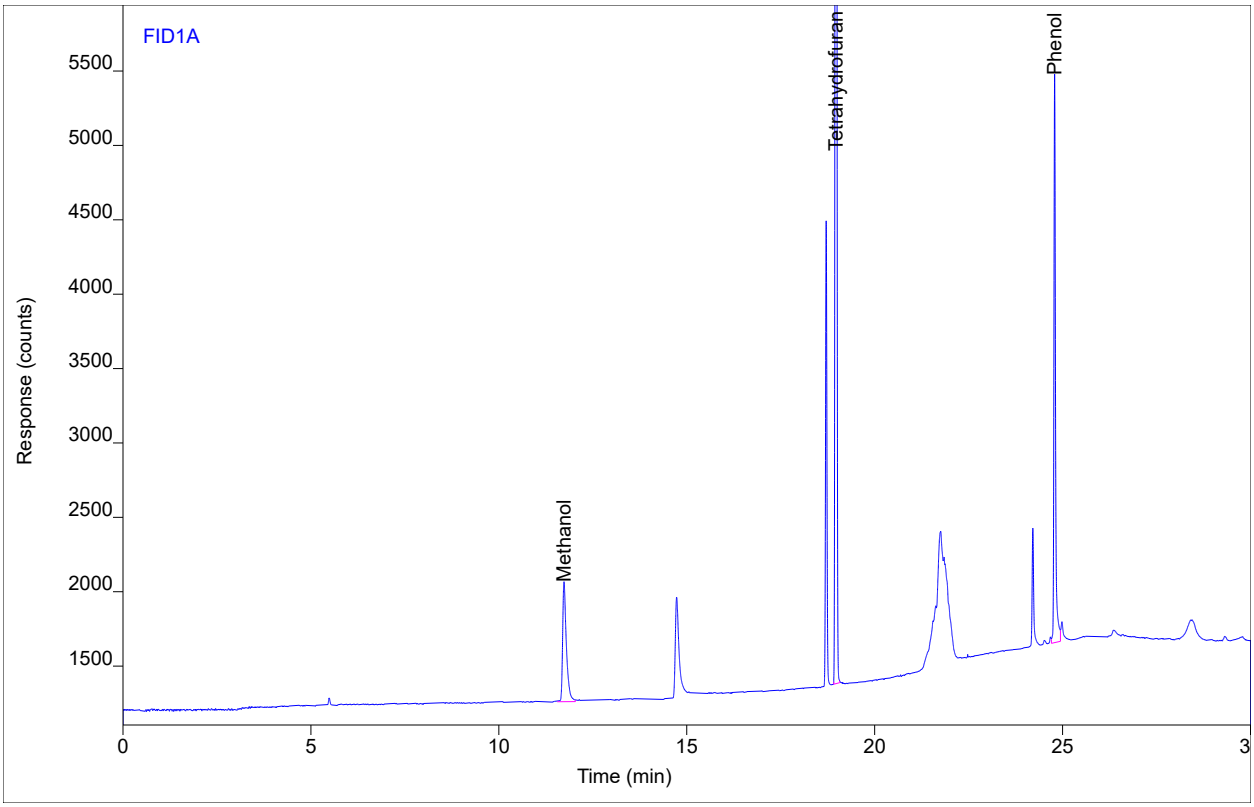
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BV	11.74	5507.70	834.015	22.1294	1	22.1294	ug/mL
Tetrahydrofuran	I BB	18.98	52613.4	20666.8	149.190			ug/mL
Phenol	VV	24.84	11643.8	4042.38	27.5361	1	27.5361	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0842 ver.3
Inj Data File	010F0101.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/26/2023 8:25 AM
File Modified	7/26/2023 2:12 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	10
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/26/2023 2:11 PM
Printed	7/26/2023 3:40 PM



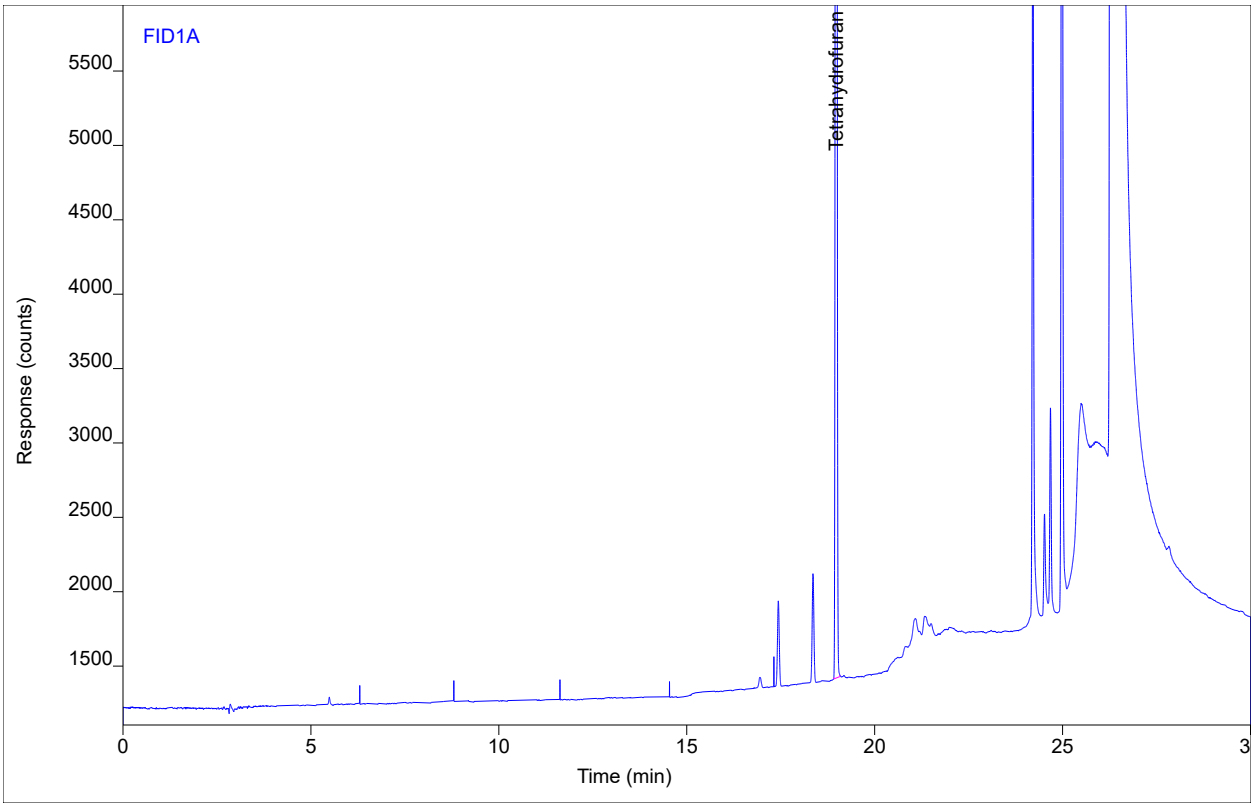
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.74	5604.43	807.275	22.5995	1	22.5995	ug/mL
Tetrahydrofuran	I BB	18.97	52424.0	20666.1	149.190			ug/mL
Phenol	VV	24.79	11174.2	3812.86	26.5209	1	26.5209	ug/mL

Chromatogram Report

Sample Name	0623-263.BLK.BHA
Sequence Name	FESTER0842 ver.3
Inj Data File	097F0401.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/26/2023 10:12 AM
File Modified	7/26/2023 2:12 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Sample
Vial Number	97
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/26/2023 2:11 PM
Printed	7/26/2023 3:40 PM



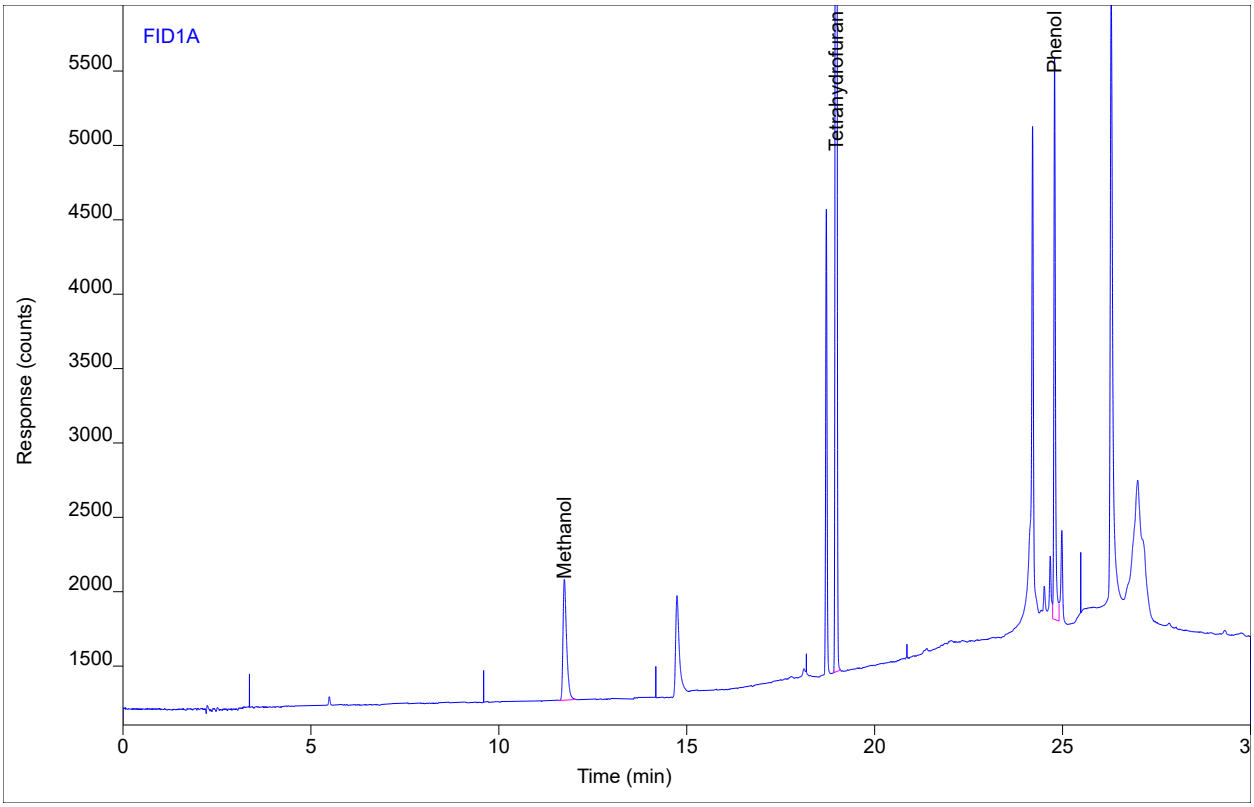
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol		(11.74)				1		ug/mL
Tetrahydrofuran	I BB	18.98	56315.8	22119.7	149.190			ug/mL
Phenol		(24.86)				1		ug/mL

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0842 ver.3
Inj Data File	010F0801.D
File Location	GC/2023/Fester/Quarter 3
Injection Date	7/26/2023 12:34 PM
File Modified	7/26/2023 2:12 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	10
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	7/26/2023 2:11 PM
Printed	7/26/2023 3:40 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.74	5432.44	816.672	21.9151	1	21.9151	ug/mL
Tetrahydrofuran	I BB	18.97	52401.9	20549.2	149.190			ug/mL
Phenol	VV	24.79	10738.9	3773.09	25.4986	1	25.4986	ug/mL

Calibration Table

Calib. Data Modified : Monday, June 26, 2023 12:23:39 PM

Rel. Reference Window : 0.000 %
Abs. Reference Window : 0.400 min
Rel. Non-ref. Window : 0.000 %
Abs. Non-ref. Window : 0.150 min
Uncalibrated Peaks : not reported
Partial Calibration : Yes, identified peaks are recalibrated
Correct All Ret. Times: No, only for identified peaks

Curve Type : Average Response/Amount
Origin : Ignored
Weight : Equal

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Sample ISTD Information:

ISTD #	ISTD Amount [ug/mL]	Name
1	149.19000	Tetrahydrofuran

Signal 1: FID2 B,
Signal 2: FID1 A,

RetTime [min]	Sig	Lvl	Amount [ug/mL]	Area	Amt/Area	Ref	Grp	Name
11.735	2	1	3.79528e-1	110.87212	3.42311e-3	1		Methanol
		2	9.48252e-1	254.05077	3.73253e-3			
		3	4.72239	1246.11243	3.78970e-3			
		4	23.15122	5708.50684	4.05556e-3			
		5	45.20000	1.15769e4	3.90433e-3			
		6	105.46667	2.65565e4	3.97141e-3			
		7	949.20000	2.32222e5	4.08746e-3			
14.747	2	1	3.76676e-1	82.70997	4.55418e-3	1		Ethanol
		2	9.41125e-1	204.73123	4.59688e-3			
		3	4.68690	1143.99426	4.09696e-3			
		4	22.97722	5178.28320	4.43723e-3			
		5	44.86029	1.07985e4	4.15431e-3			
		6	104.67400	2.58476e4	4.04966e-3			
		7	942.06600	2.54901e5	3.69582e-3			

RetTime [min]	Sig	Lvl	Amount [ug/mL]	Area	Amt/Area	Ref	Grp	Name
18.731	2	1	3.85110e-1	138.62234	2.77812e-3		1	2-Butanone
		2	9.62198e-1	346.38651	2.77782e-3			
		3	4.79184	1763.44043	2.71732e-3			
		4	23.49170	8539.21289	2.75104e-3			
		5	45.86475	1.72049e4	2.66580e-3			
		6	107.01776	3.93543e4	2.71934e-3			
		7	963.15984	3.36939e5	2.85856e-3			
18.985	2	1	149.19000	5.60711e4	2.66073e-3		I1	Tetrahydrofuran
		2	149.19000	5.56343e4	2.68162e-3			
		3	149.19000	5.46498e4	2.72993e-3			
		4	149.19000	5.44407e4	2.74041e-3			
		5	149.19000	5.55217e4	2.68706e-3			
		6	149.19000	5.42298e4	2.75107e-3			
		7	149.19000	5.46873e4	2.72806e-3			
24.859	2	1	4.18613e-1	166.87405	2.50856e-3		1	Phenol
		2	1.04591	420.31168	2.48841e-3			
		3	5.20872	2216.61182	2.34986e-3			
		4	25.53541	1.12283e4	2.27420e-3			
		5	49.85486	2.27546e4	2.19098e-3			
		6	116.32800	5.66135e4	2.05477e-3			
		7	1046.95200	5.07730e5	2.06202e-3			

More compound-specific settings:

Compound: Methanol
  Time Window : From 11.518 min To 11.960 min

Compound: Ethanol
  Time Window : From 14.542 min To 14.978 min

Compound: 2-Butanone
  Time Window : From 18.611 min To 18.857 min

Compound: Tetrahydrofuran
  Time Window : From 18.872 min To 19.101 min

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Peak Sum Table

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No Entries in table

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Calibration Curves

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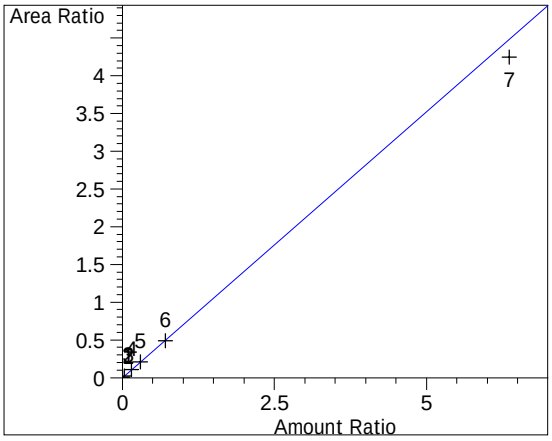
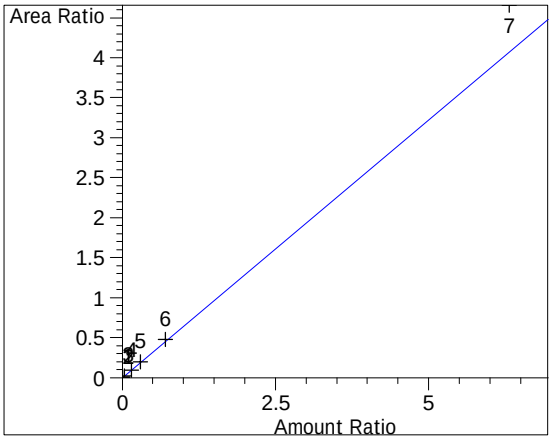
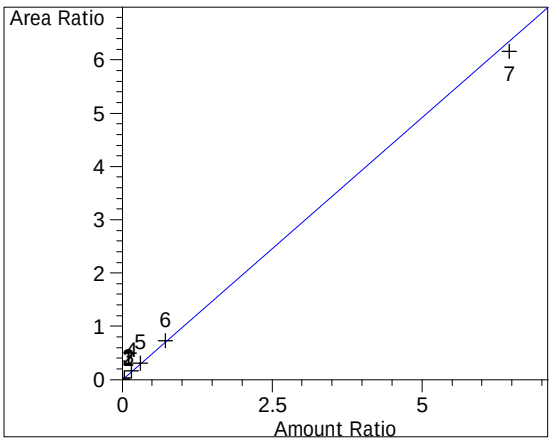


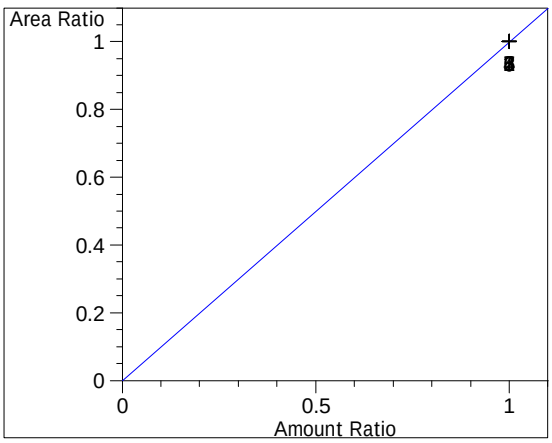
Methanol at exp. RT: 11.735
FID1 A,
Correlation: 0.99999
Residual Std. Dev.: 0.10915
Formula: y = mx
m: 7.05738e-1
x: Amount
y: Area



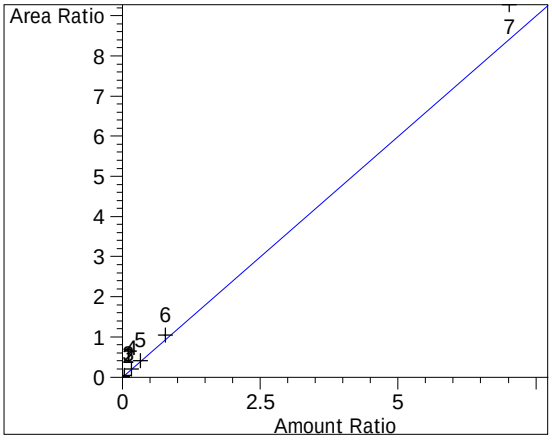
Ethanol at exp. RT: 14.747
FID1 A,
Correlation: 0.99996
Residual Std. Dev.: 0.26294
Formula: y = mx
m: 6.45116e-1
x: Amount
y: Area



2-Butanone at exp. RT: 18.731
FID1 A,
Correlation: 0.99998
Residual Std. Dev.: 0.09014
Formula: y = mx
m: 9.85411e-1
x: Amount
y: Area



Tetrahydrofuran at exp. RT: 18.985
FID1 A,
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: y = mx
m: 1.00000
x: Amount
y: Area



Phenol at exp. RT: 24.859
FID1 A,
Correlation: 0.99999
Residual Std. Dev.: 0.39207
Formula: y = mx
m: 1.19905
x: Amount
y: Area

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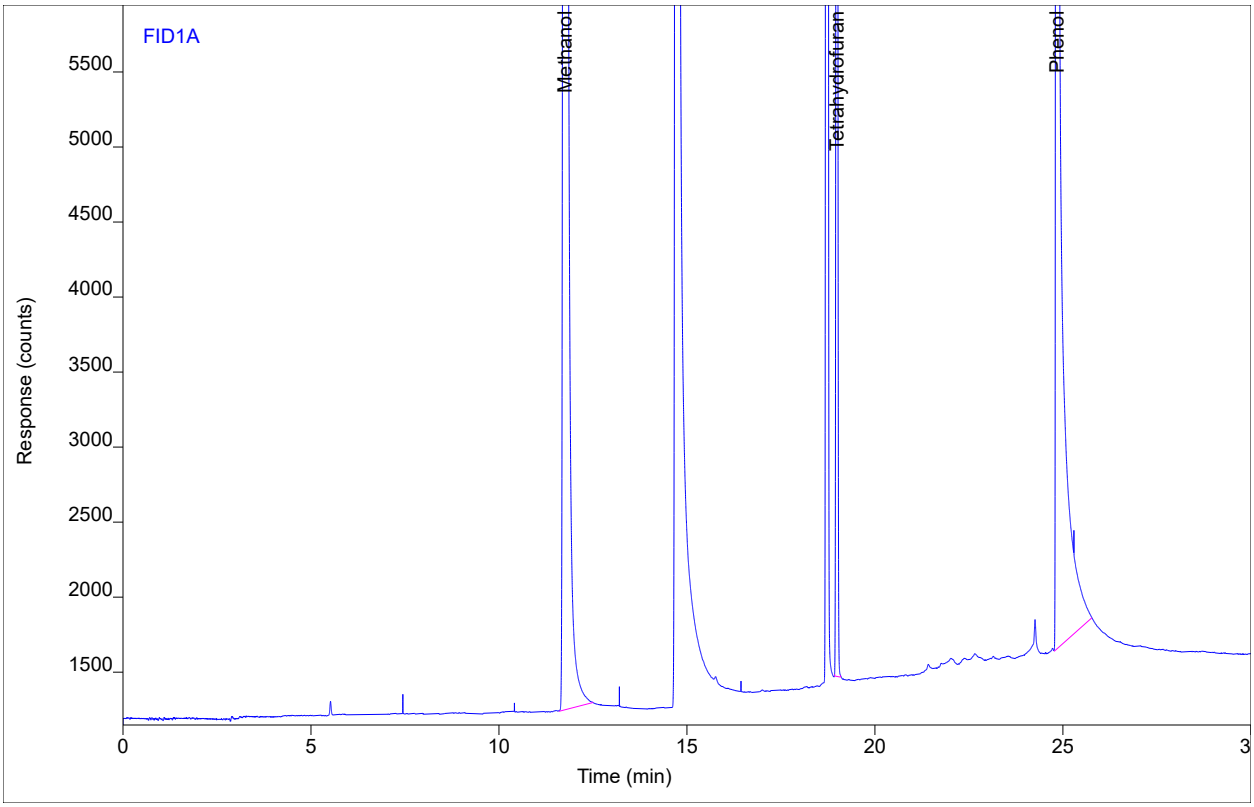
Chromatogram Report

Sample Name	gcstds1855 #7
Sequence Name	FESTER0821 1 ver.1
Inj Data File	034F0601.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 1:28 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 34
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	MM	11.75	232222	39819.2	897.664	1	897.664	ug/mL
Tetrahydrofuran	BB	18.99	54687.3	21452.1	149.190	1	149.190	ug/mL
Phenol	MM	24.84	507730	179279	1155.18	1	1155.18	ug/mL

Analyst Peak Integration Comments

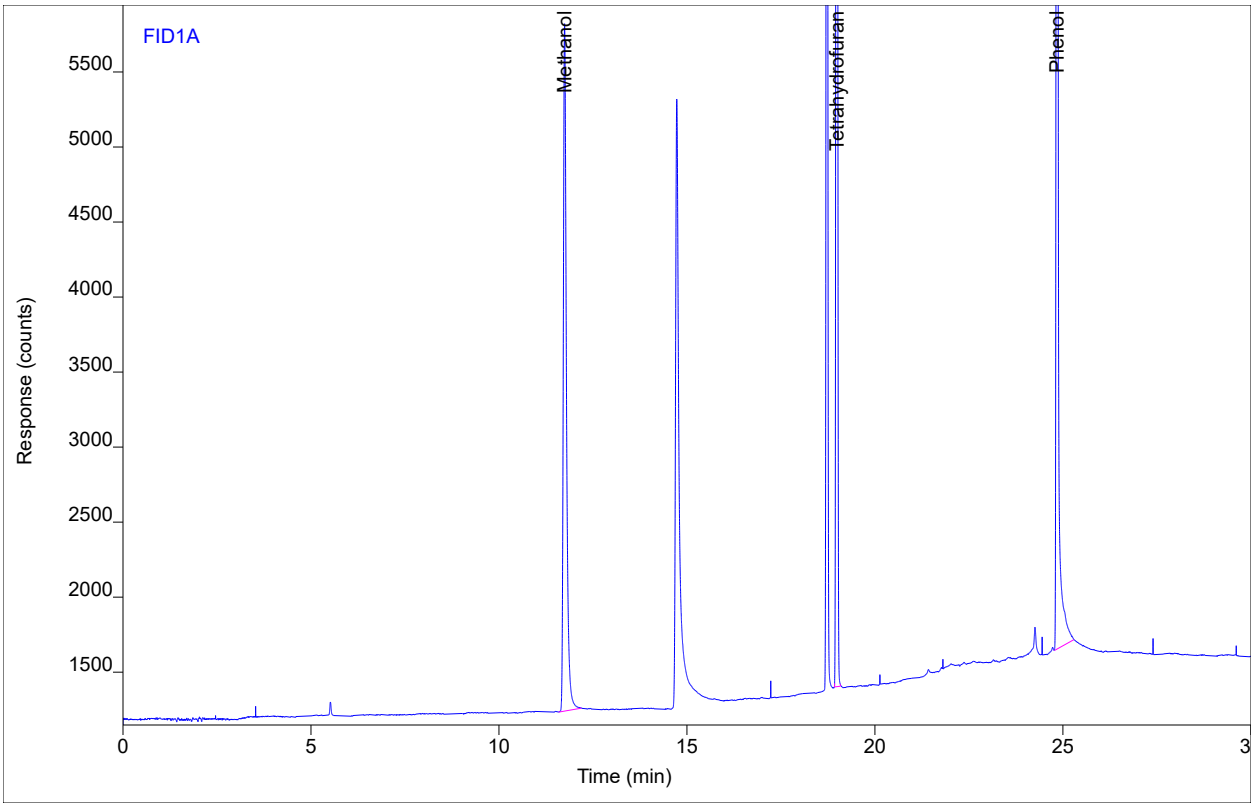
07:29:20 06/26/23 Remington Heathcoat ii

Chromatogram Report

Sample Name	gcstds1855 #6
Sequence Name	FESTER0821 1 ver.1
Inj Data File	035F0701.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 2:04 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 35
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.75	26556.5	4577.77	103.521	1	103.521	ug/mL
Tetrahydrofuran	BB	18.99	54229.8	21440.9	149.190	1	149.190	ug/mL
Phenol	MM	24.84	56613.5	19705.7	129.893	1	129.893	ug/mL

Analyst Peak Integration Comments

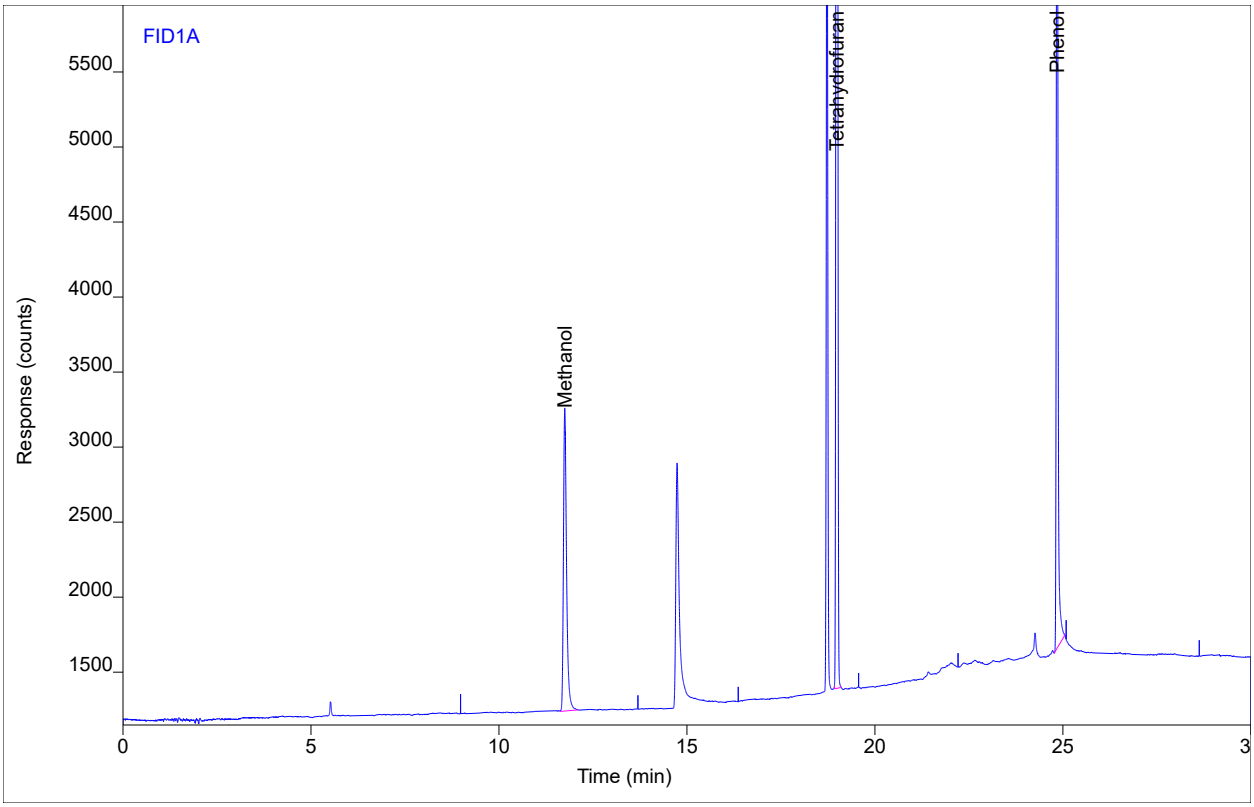
08:35:53 06/26/23 Remington Heathcoat ii

Chromatogram Report

Sample Name	gcstds1855 #5
Sequence Name	FESTER0821 1 ver.1
Inj Data File	036F0801.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 2:40 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 36
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



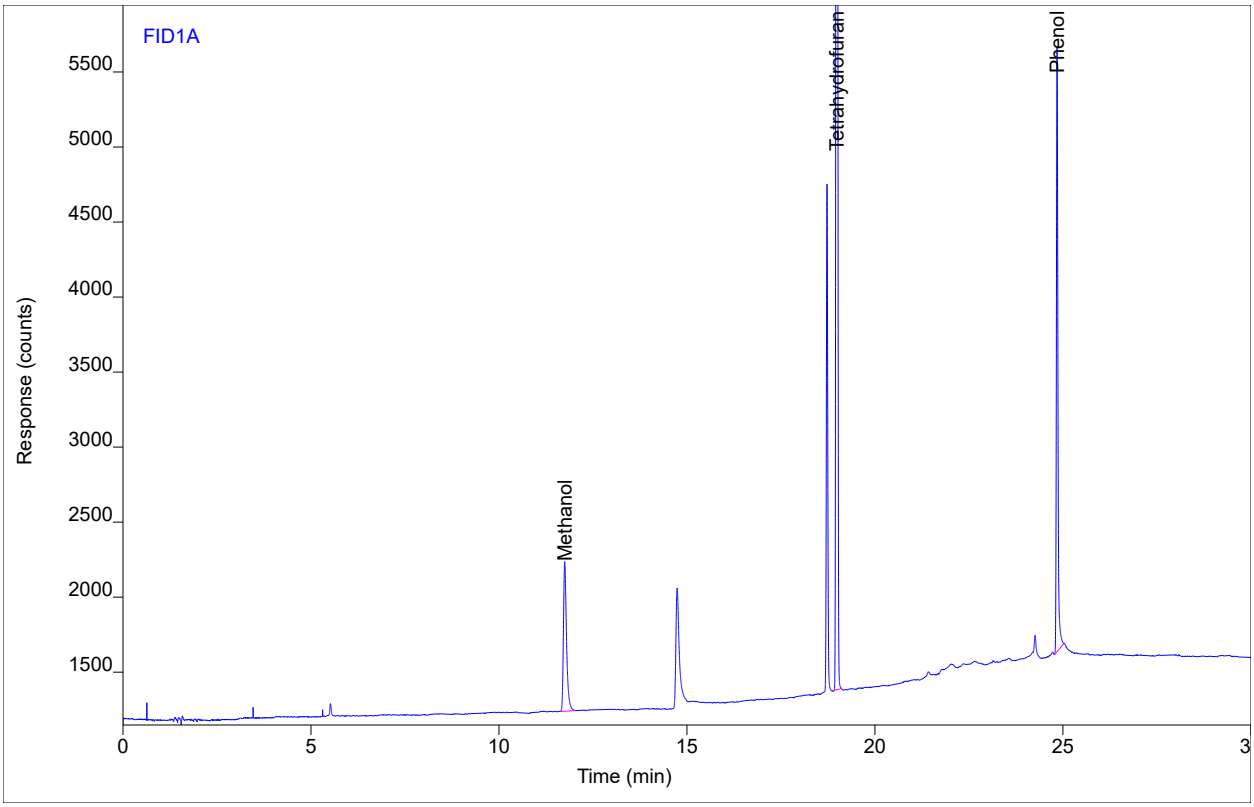
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.75	11576.9	2018.21	44.0784	1	44.0784	ug/mL
Tetrahydrofuran	BB	18.99	55521.7	21731.7	149.190	1	149.190	ug/mL
Phenol	VB	24.85	22754.6	8206.78	50.9929	1	50.9929	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #4
Sequence Name	FESTER0821 1 ver.1
Inj Data File	037F0901.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 3:16 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 37
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



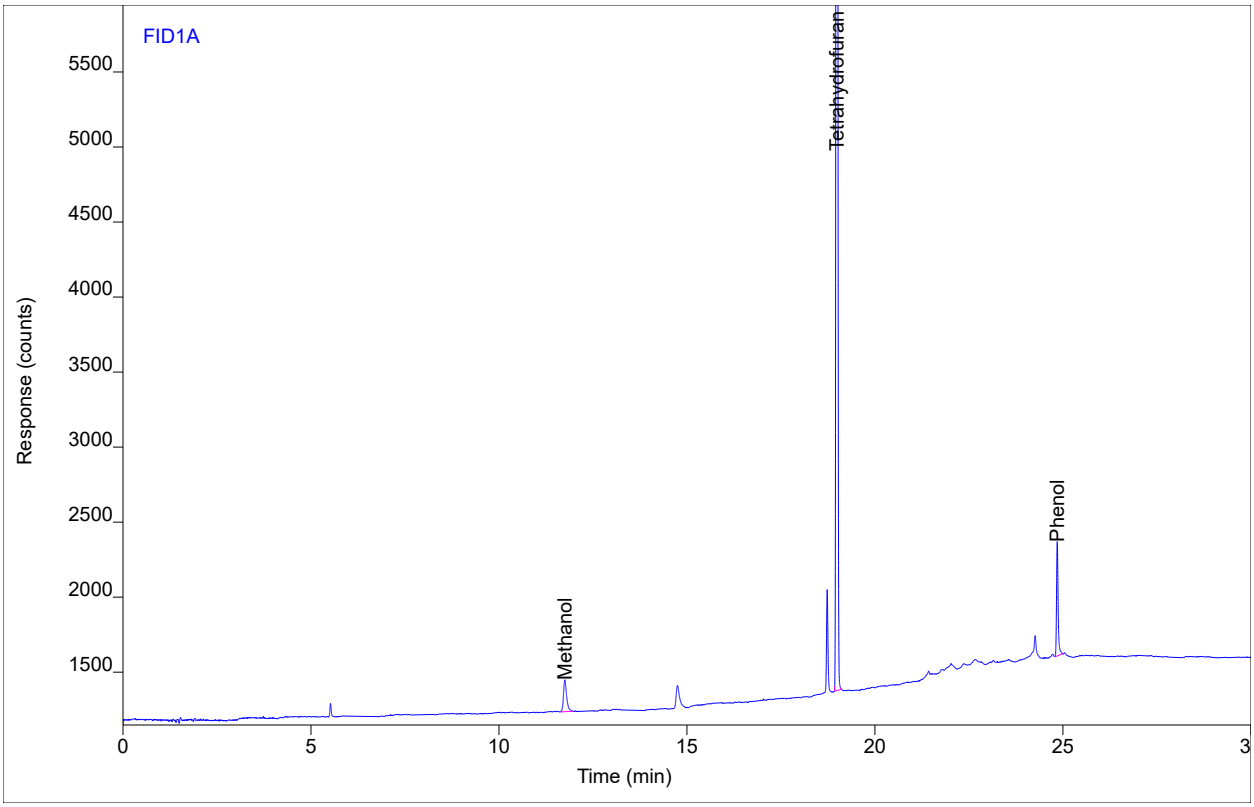
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.75	5708.51	998.001	22.1664	1	22.1664	ug/mL
Tetrahydrofuran	BB	18.99	54440.7	21499.0	149.190	1	149.190	ug/mL
Phenol	VB	24.85	11228.3	3999.46	25.6622	1	25.6622	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #3
Sequence Name	FESTER0821 1 ver.1
Inj Data File	038F1001.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 3:52 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 38
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



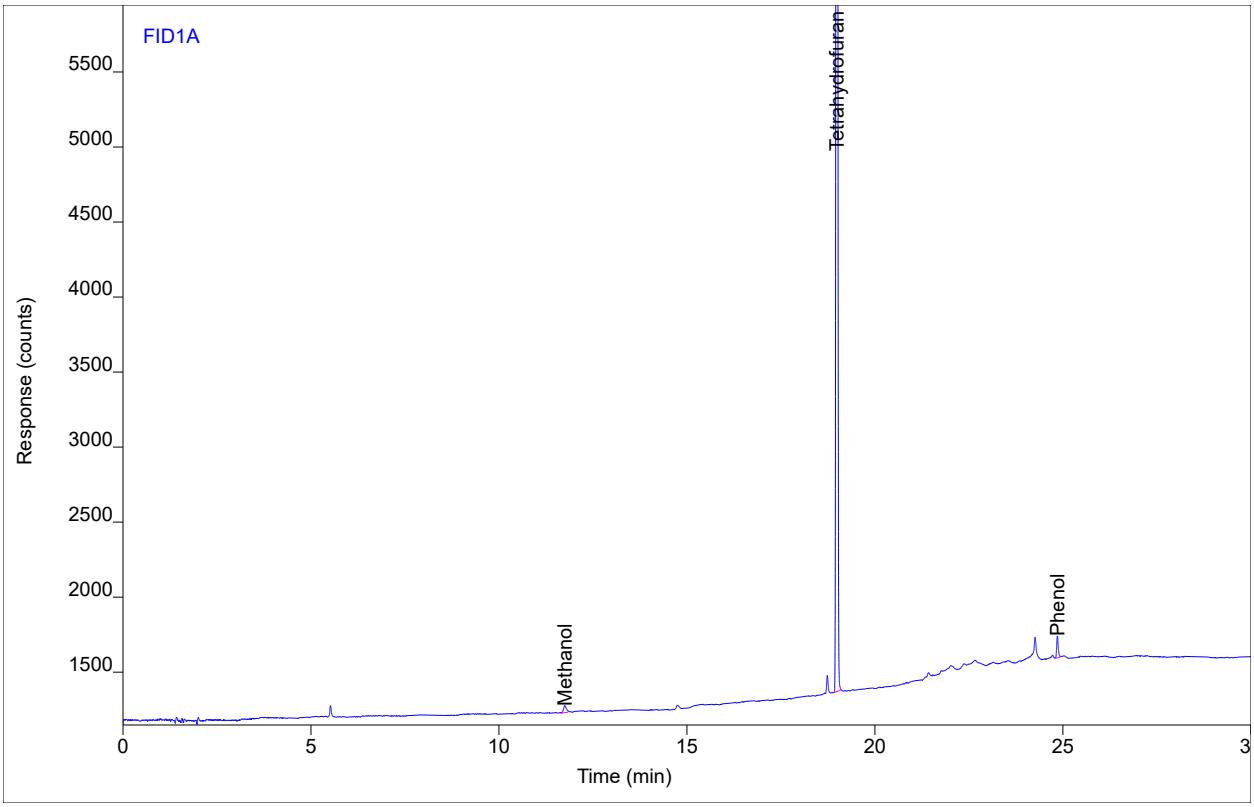
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VB	11.75	1246.11	213.589	4.82020	1	4.82020	ug/mL
Tetrahydrofuran	BB	18.99	54649.8	21602.6	149.190	1	149.190	ug/mL
Phenol	VB	24.85	2216.61	761.902	5.04666	1	5.04666	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #2
Sequence Name	FESTER0821 1 ver.1
Inj Data File	039F1101.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 4:28 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 39
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



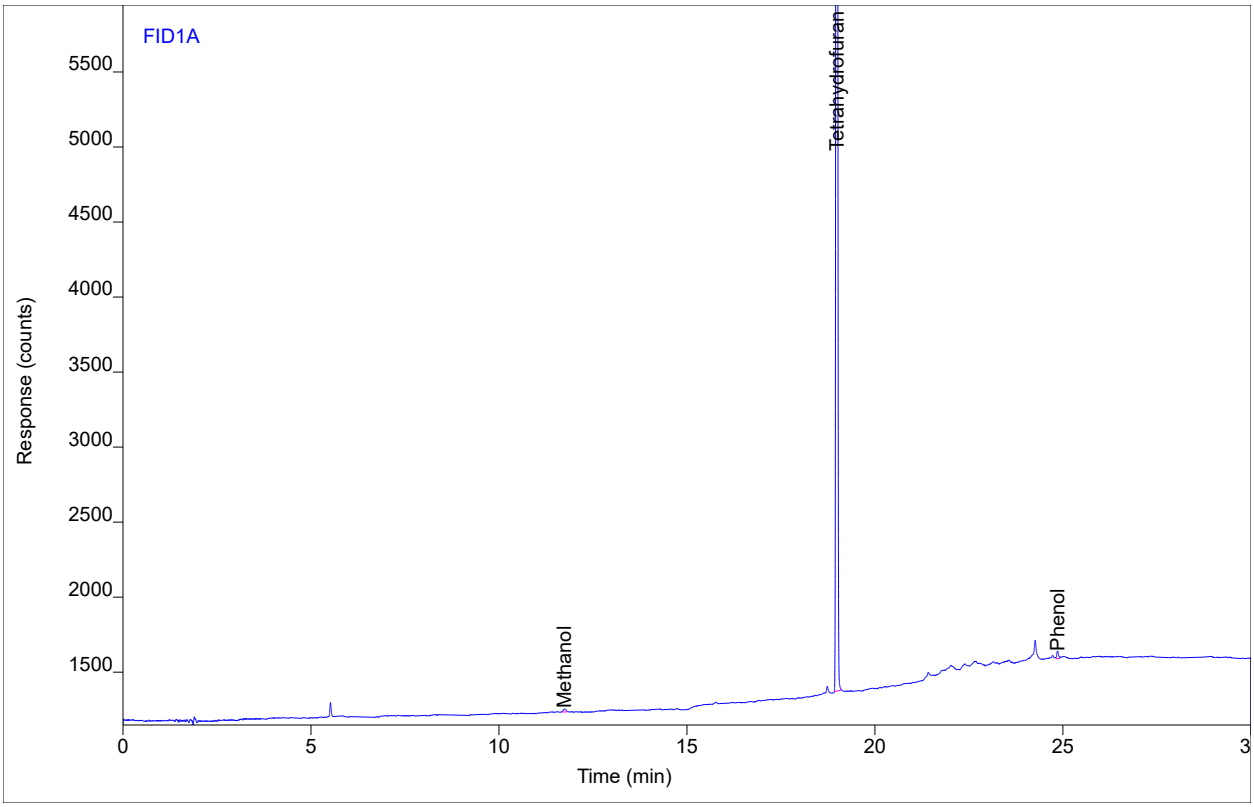
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	VV	11.75	254.051	47.8732	0.96533	1	0.96533	ug/mL
Tetrahydrofuran	BB	18.99	55634.3	22000.8	149.190	1	149.190	ug/mL
Phenol	BB	24.85	420.312	145.379	0.94001	1	0.94001	ug/mL

Chromatogram Report

Sample Name	gcstds1855 #1
Sequence Name	FESTER0821 1 ver.1
Inj Data File	040F1201.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 5:04 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	MM	11.74	110.872	25.5369	0.41800	1	0.41800	ug/mL
Tetrahydrofuran	BB	18.99	56071.1	22009.1	149.190	1	149.190	ug/mL
Phenol	MM	24.86	166.874	53.9441	0.37030	1	0.37030	ug/mL

Analyst Peak Integration Comments

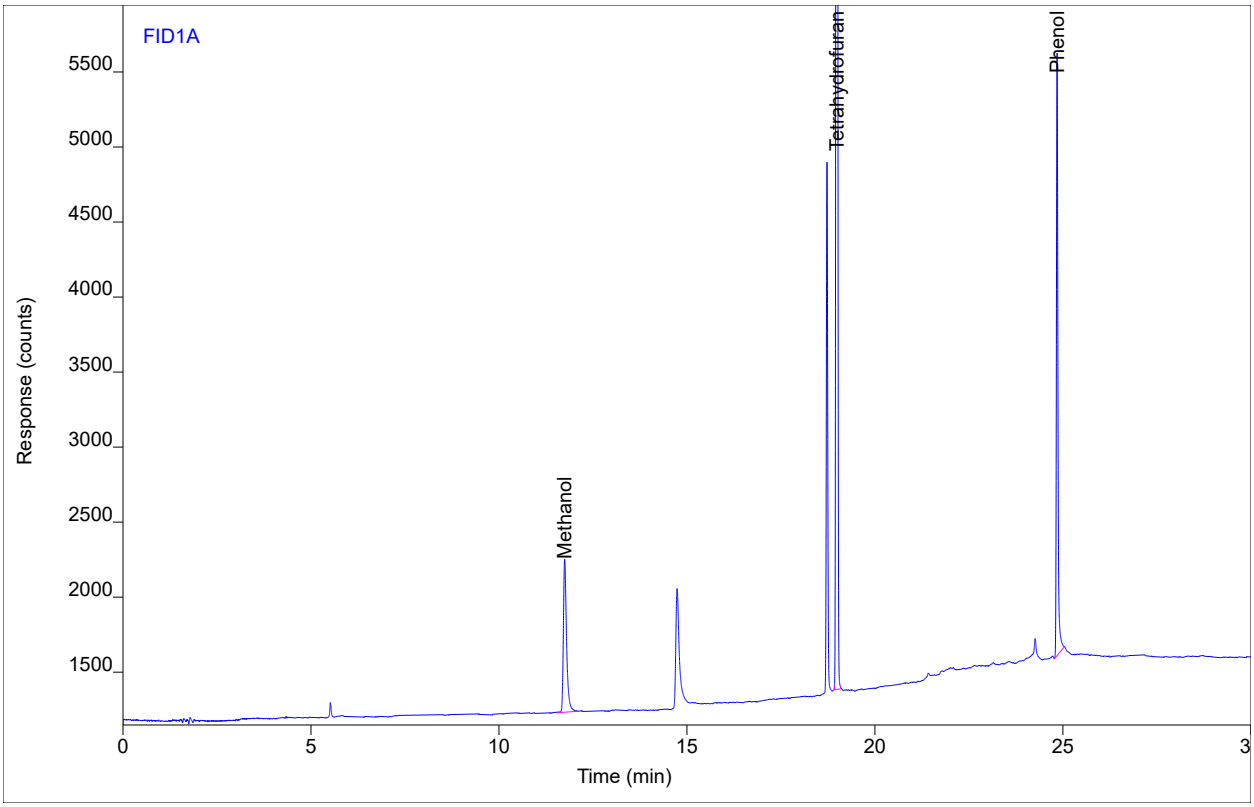
08:22:02 06/25/23	Remington Heathcoat	ii
08:22:51 06/25/23	Remington Heathcoat	i
08:30:43 06/26/23	Remington Heathcoat	ii
08:32:23 06/26/23	Remington Heathcoat	ii
08:56:18 06/26/23	Remington Heathcoat	ni-2-butanone
08:57:52 06/26/23	Remington Heathcoat	ni-ethanol
08:58:44 06/26/23	Remington Heathcoat	ii

Chromatogram Report

Sample Name	gcstds1855 #3ss
Sequence Name	FESTER0821 1 ver.1
Inj Data File	041F1301.D
File Location	GC/2023/Fester/Quarter 2
Injection Date	6/23/2023 5:40 PM
File Modified	6/26/2023 12:52 PM
Instrument	Fester
Operator	Remington Heathcoat

Enthalpy Analytical

Sample Type	Control
Vial Number	Vial 41
Injection Volume	1
Injection	1 of 1
Acquisition Method	FESTER0258.M
Analysis Method	FESTER0821_MEOH_PHENOL_THF-IS.M
Method Modified	6/26/2023 12:49 PM
Printed	6/26/2023 2:04 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Methanol	BB	11.75	6008.68	1021.39	22.0546	1	22.0546	ug/mL
Tetrahydrofuran	BB	18.99	57593.9	22565.9	149.190	1	149.190	ug/mL
Phenol	VB	24.85	11243.2	4002.76	24.2894	1	24.2894	ug/mL

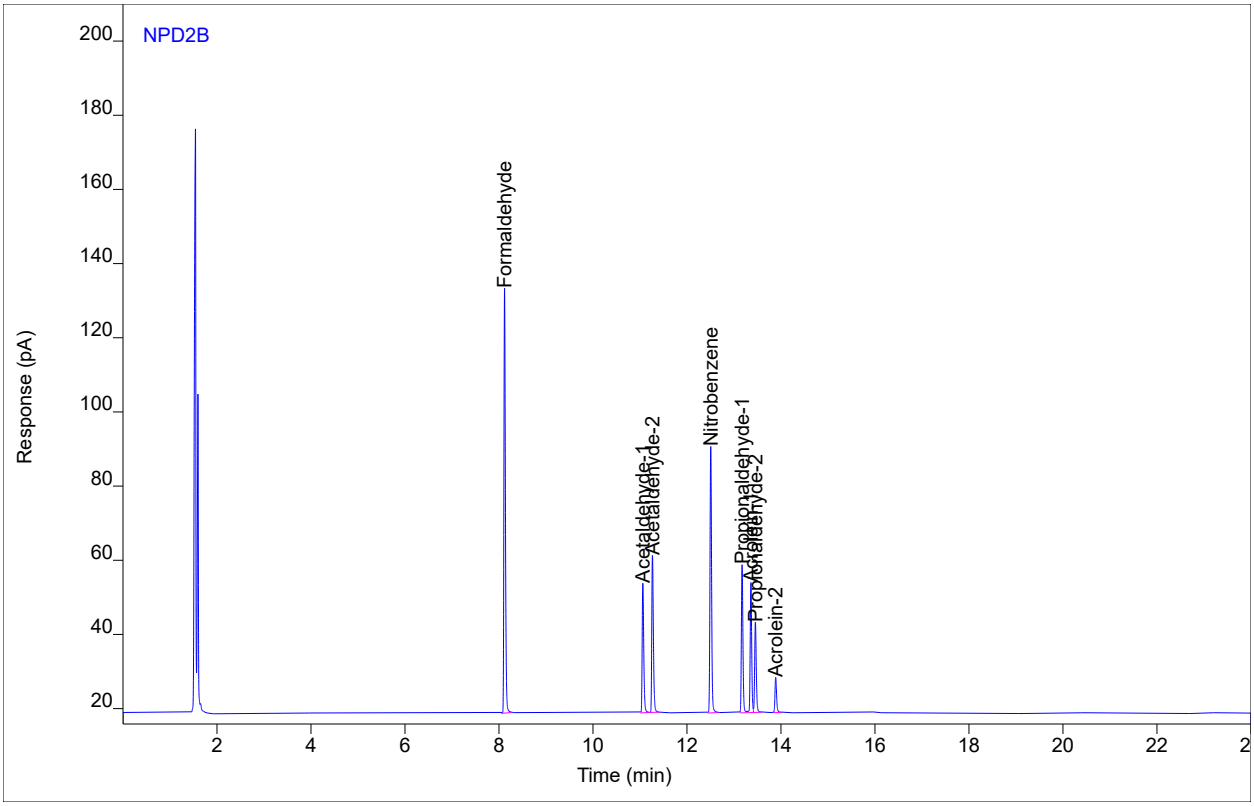
Raw Data

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0463 ver.1
Inj Data File	040B0601.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 12:54 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



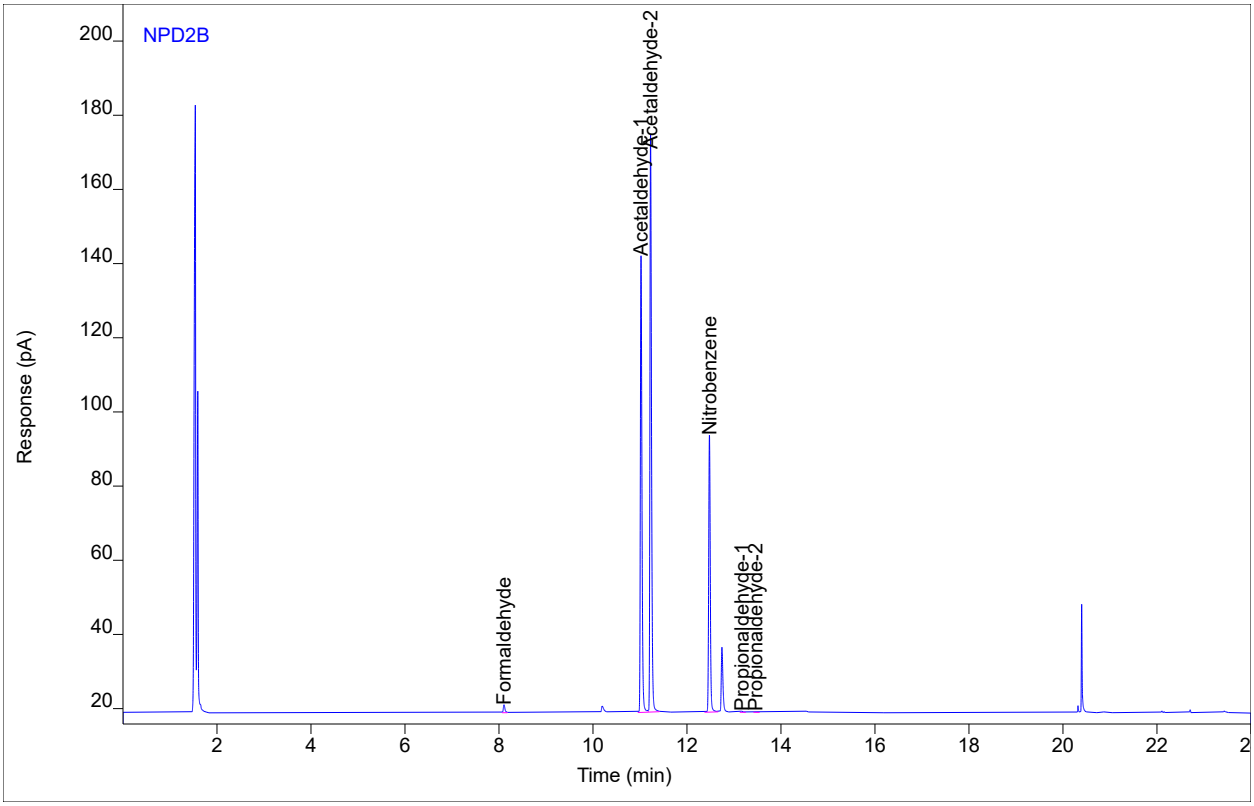
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				5.96350	1	5.96350	
Acrolein	Group				6.33704	1	6.33704	
Propionaldehyde	Group				6.17200	1	6.17200	
Formaldehyde	BB	8.12	250.199	114.615	6.24373	1	6.24373	ug/ml
Acetaldehyde-1	VB	11.06	81.0862	35.0615	2.67094	1	2.67094	ug/ml
Acetaldehyde-2	BB	11.27	99.9577	42.4888	3.29256	1	3.29256	ug/ml
Nitrobenzene	BB	12.51	168.037	71.9717	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.17	90.4789	40.0494	3.76910	1	3.76910	ug/ml
Acrolein-1	BV	13.36	76.4540	35.1811	4.88171	1	4.88171	ug/ml
Propionaldehyde-2	VB	13.46	57.6826	24.4373	2.40290	1	2.40290	ug/ml
Acrolein-2	BB	13.89	22.7923	9.62280	1.45533	1	1.45533	ug/ml

Chromatogram Report

Sample Name	0623-263.R1.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	026B0801.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 2:44 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 26
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



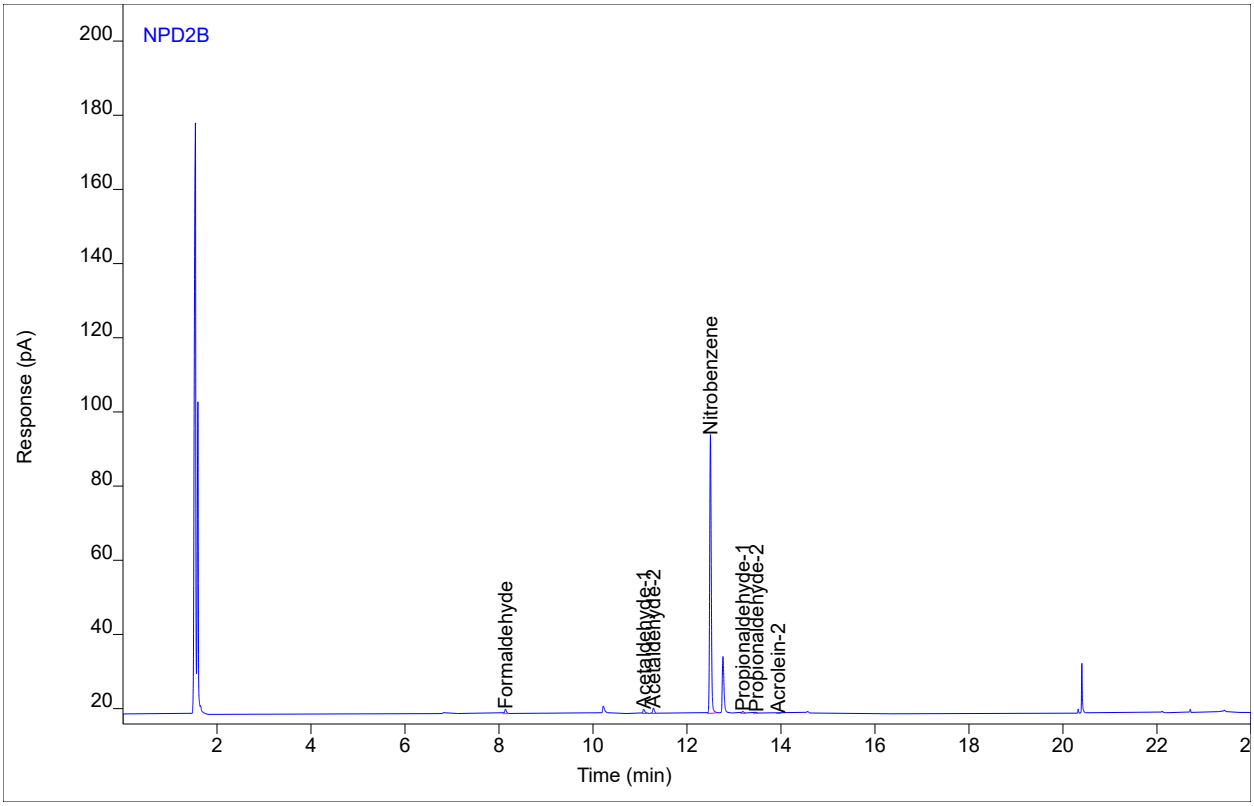
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				20.6013	1	20.6013	
Acrolein	Group					1		
Propionaldehyde	Group				0.08722	1	0.08722	
Formaldehyde	VV	8.11	5.22688	2.19716	0.12567	1	0.12567	ug/ml
Acetaldehyde-1	VV	11.02	285.956	123.351	9.07530	1	9.07530	ug/ml
Acetaldehyde-2	VV	11.23	363.176	155.756	11.5260	1	11.5260	ug/ml
Nitrobenzene	BB	12.48	174.405	74.7600	100.000	1	100.000	ug/ml
Propionaldehyde-1	VB	13.17	1.26757	0.46807	0.05088	1	0.05088	ug/ml
Acrolein-1		(13.38)				1		
Propionaldehyde-2	BB	13.46	0.90556	0.29702	0.03635	1	0.03635	ug/ml
Acrolein-2		(13.91)				1		

Chromatogram Report

Sample Name	0623-263.R1-DUP.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	027B0901.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 3:13 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 27
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



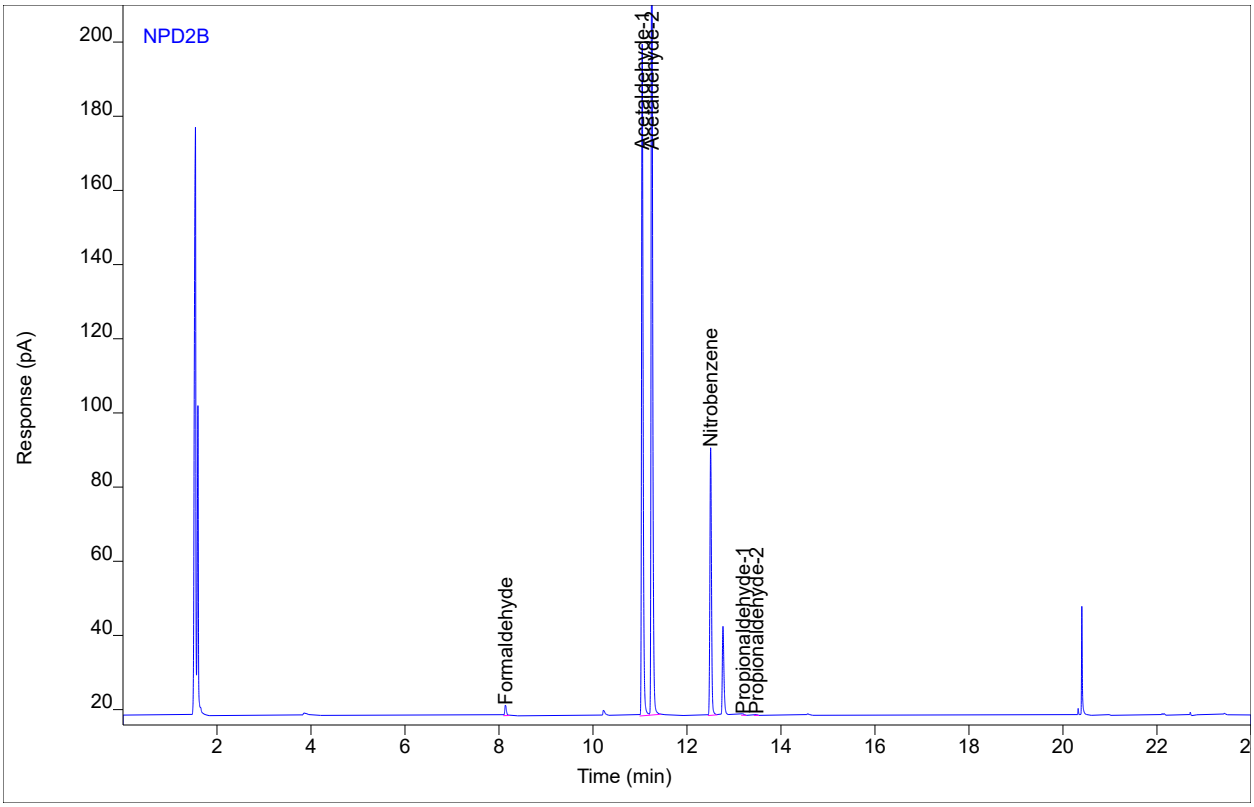
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				0.23573	1	0.23573	
Acrolein	Group				0.02396	1	0.02396	
Propionaldehyde	Group				0.09179	1	0.09179	
Formaldehyde	BV	8.14	3.15037	1.29794	0.07600	1	0.07600	ug/ml
Acetaldehyde-1	VV	11.08	3.31094	1.33344	0.10542	1	0.10542	ug/ml
Acetaldehyde-2	BB	11.29	4.09238	1.63369	0.13031	1	0.13031	ug/ml
Nitrobenzene	VB	12.50	173.833	75.1955	100.000	1	100.000	ug/ml
Propionaldehyde-1	VV	13.19	1.41075	0.55793	0.05681	1	0.05681	ug/ml
Acrolein-1		(13.38)				1		
Propionaldehyde-2	VV	13.48	0.86862	0.33514	0.03498	1	0.03498	ug/ml
Acrolein-2	VV	13.94	0.38827	0.10141	0.02396	1	0.02396	ug/ml

Chromatogram Report

Sample Name	0623-263.R2.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	028B1001.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 3:42 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 28
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



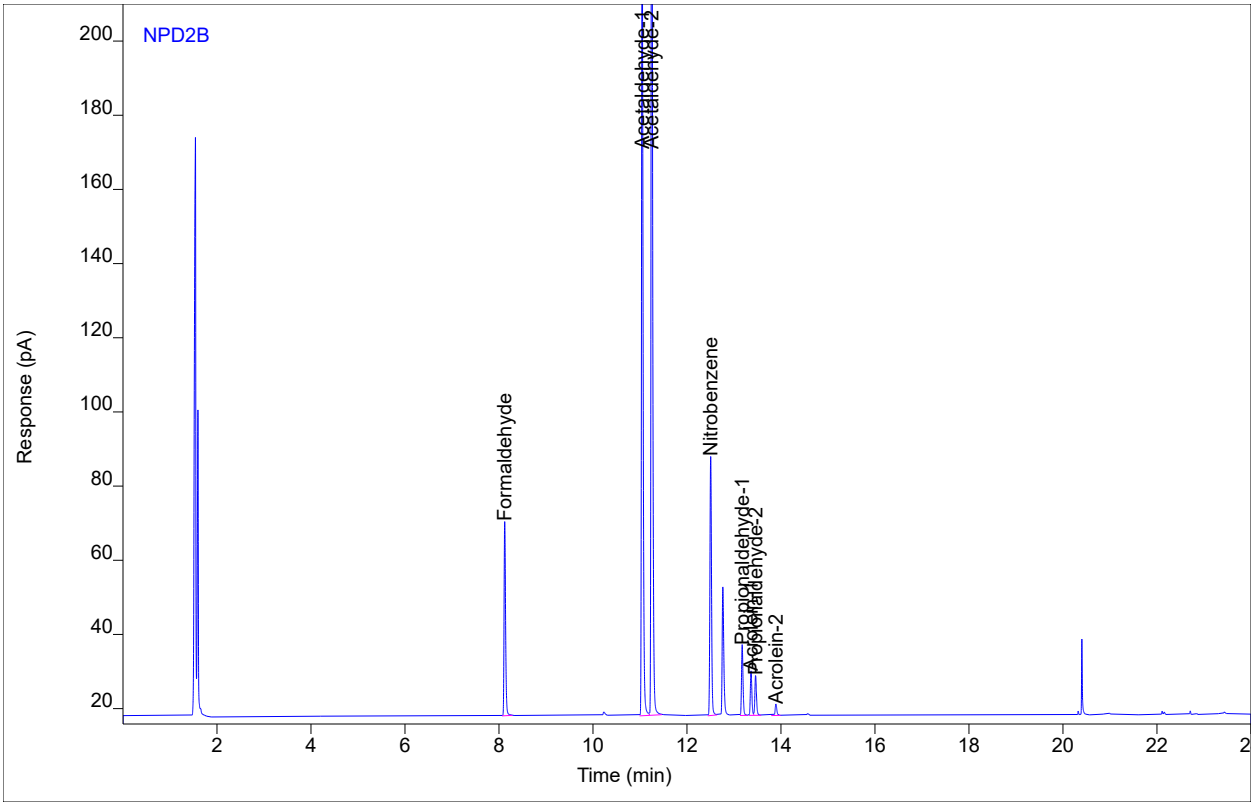
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				30.9041	1	30.9041	
Acrolein	Group					1		
Propionaldehyde	Group				0.07801	1	0.07801	
Formaldehyde	VB	8.14	6.86512	2.99437	0.16979	1	0.16979	ug/ml
Acetaldehyde-1	VV	11.05	416.280	181.146	13.5900	1	13.5900	ug/ml
Acetaldehyde-2	VV	11.25	530.351	231.127	17.3141	1	17.3141	ug/ml
Nitrobenzene	VB	12.50	169.545	72.3709	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.20	1.19454	0.47629	0.04932	1	0.04932	ug/ml
Acrolein-1		(13.38)				1		
Propionaldehyde-2	BV	13.48	0.69485	0.27842	0.02869	1	0.02869	ug/ml
Acrolein-2		(13.91)				1		

Chromatogram Report

Sample Name	0623-263.R2-L-SPK.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	029B1101.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 4:11 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 29
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



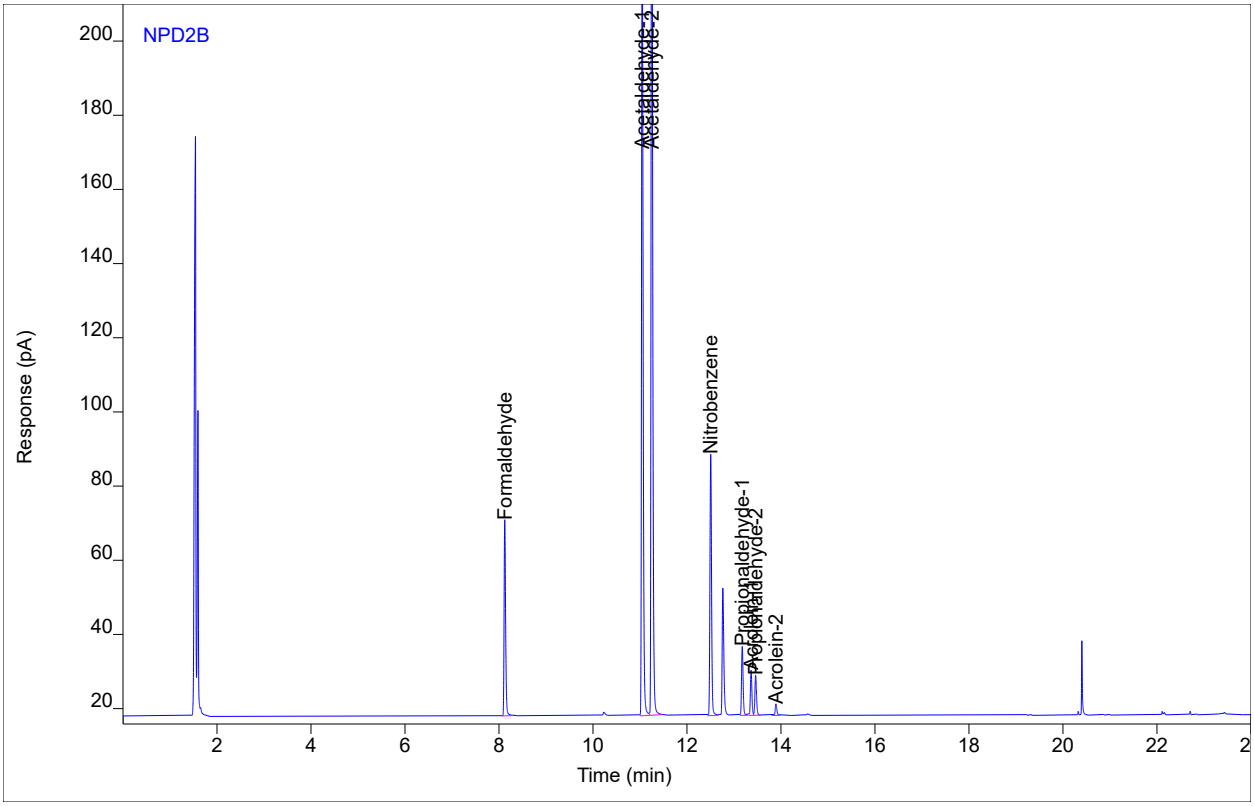
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				38.1971	1	38.1971	
Acrolein	Group				2.24043	1	2.24043	
Propionaldehyde	Group				2.88491	1	2.88491	
Formaldehyde	VB	8.12	116.474	52.5166	2.95316	1	2.95316	ug/ml
Acetaldehyde-1	BV	11.05	499.042	218.244	16.7015	1	16.7015	ug/ml
Acetaldehyde-2	VB	11.25	642.292	278.266	21.4956	1	21.4956	ug/ml
Nitrobenzene	VB	12.50	165.388	70.0596	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.18	42.4269	19.1411	1.79569	1	1.79569	ug/ml
Acrolein-1	BV	13.36	26.9356	12.0700	1.74743	1	1.74743	ug/ml
Propionaldehyde-2	VB	13.46	25.7350	10.8695	1.08922	1	1.08922	ug/ml
Acrolein-2	BB	13.89	7.59933	3.15124	0.49300	1	0.49300	ug/ml

Chromatogram Report

Sample Name	0623-263.R2-L-SPK-LD.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	030B1201.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 4:40 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 30
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



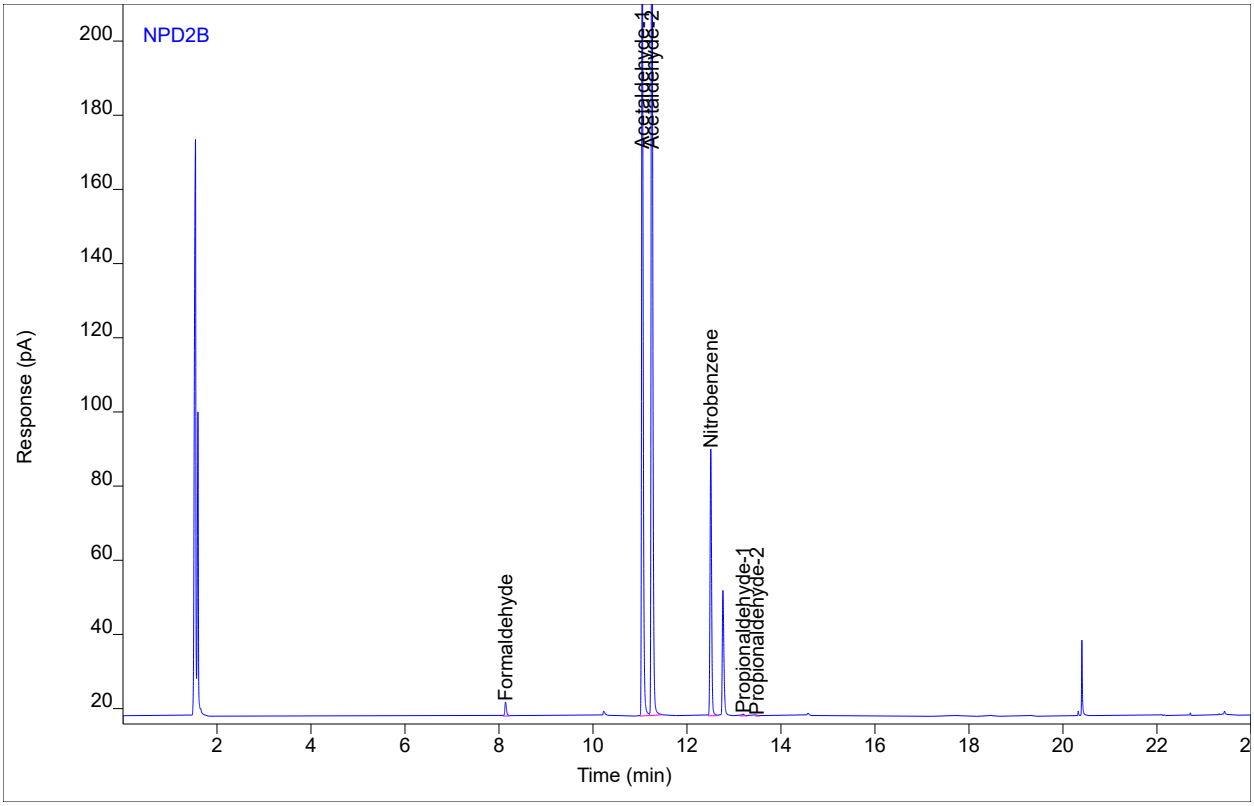
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				37.9078	1	37.9078	
Acrolein	Group				2.23273	1	2.23273	
Propionaldehyde	Group				2.89395	1	2.89395	
Formaldehyde	VB	8.12	116.744	52.9339	2.93437	1	2.93437	ug/ml
Acetaldehyde-1	BV	11.05	500.234	219.679	16.5964	1	16.5964	ug/ml
Acetaldehyde-2	VB	11.25	642.351	282.808	21.3114	1	21.3114	ug/ml
Nitrobenzene	VB	12.51	166.833	70.5321	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.18	42.9941	18.6832	1.80394	1	1.80394	ug/ml
Acrolein-1	BV	13.36	27.0082	12.1983	1.73696	1	1.73696	ug/ml
Propionaldehyde-2	VB	13.46	25.9787	10.7754	1.09001	1	1.09001	ug/ml
Acrolein-2	BB	13.89	7.70883	3.20779	0.49577	1	0.49577	ug/ml

Chromatogram Report

Sample Name	0623-263.R3.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	031B1301.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 5:09 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 31
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



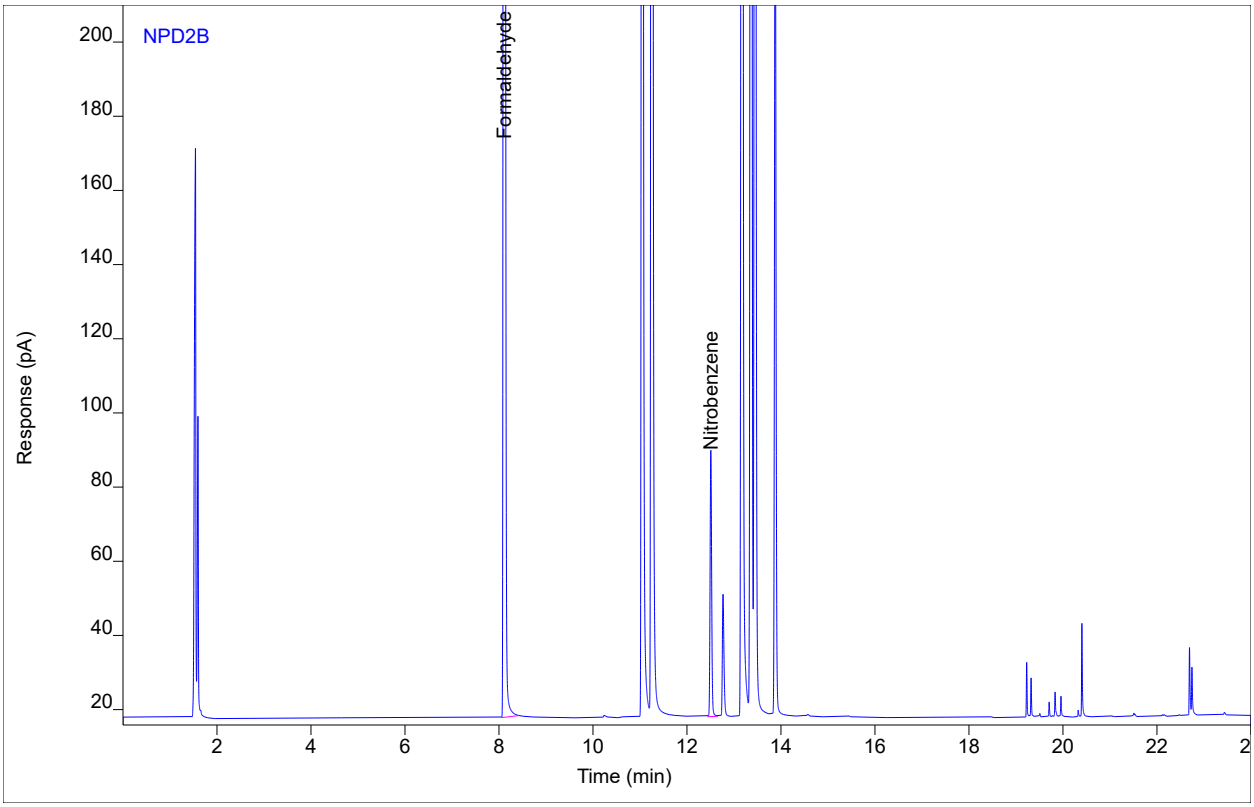
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				37.4589	1	37.4589	
Acrolein	Group					1		
Propionaldehyde	Group				0.11769	1	0.11769	
Formaldehyde	VV	8.14	9.26319	3.94808	0.23344	1	0.23344	ug/ml
Acetaldehyde-1	VV	11.05	494.768	216.995	16.4582	1	16.4582	ug/ml
Acetaldehyde-2	VV	11.25	631.325	271.387	21.0007	1	21.0007	ug/ml
Nitrobenzene	BV	12.51	166.395	72.1766	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.20	1.94769	0.69703	0.08194	1	0.08194	ug/ml
Acrolein-1		(13.38)				1		
Propionaldehyde-2	BB	13.48	0.84996	0.37418	0.03576	1	0.03576	ug/ml
Acrolein-2		(13.91)				1		

Chromatogram Report

Sample Name	0623-263.R3-H-SPK.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	032B1401.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 5:38 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 32
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



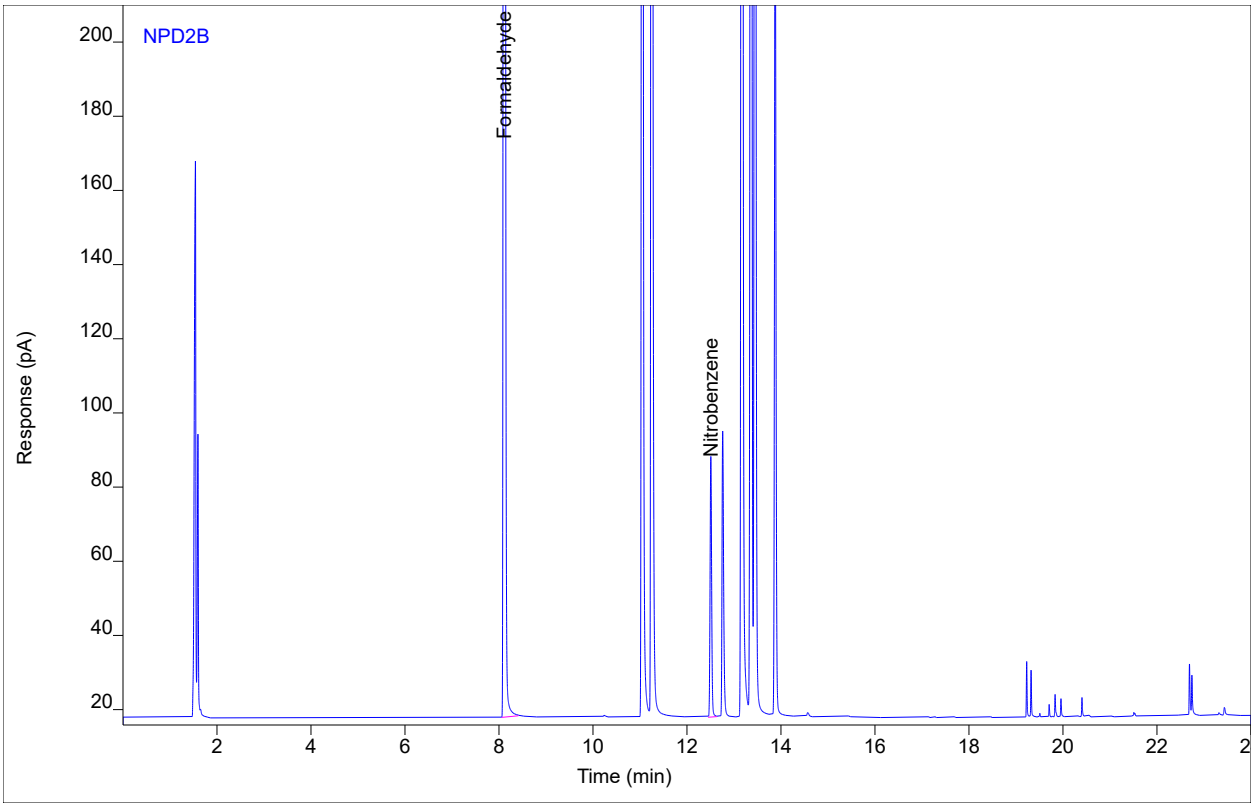
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Formaldehyde	BB	8.11	3723.18	1705.33	93.6695	1	93.6695	ug/ml
Nitrobenzene	VB	12.51	166.678	71.9550	100.000	1	100.000	ug/ml

Chromatogram Report

Sample Name	0623-263.TS.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	033B1501.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 6:07 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 33
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



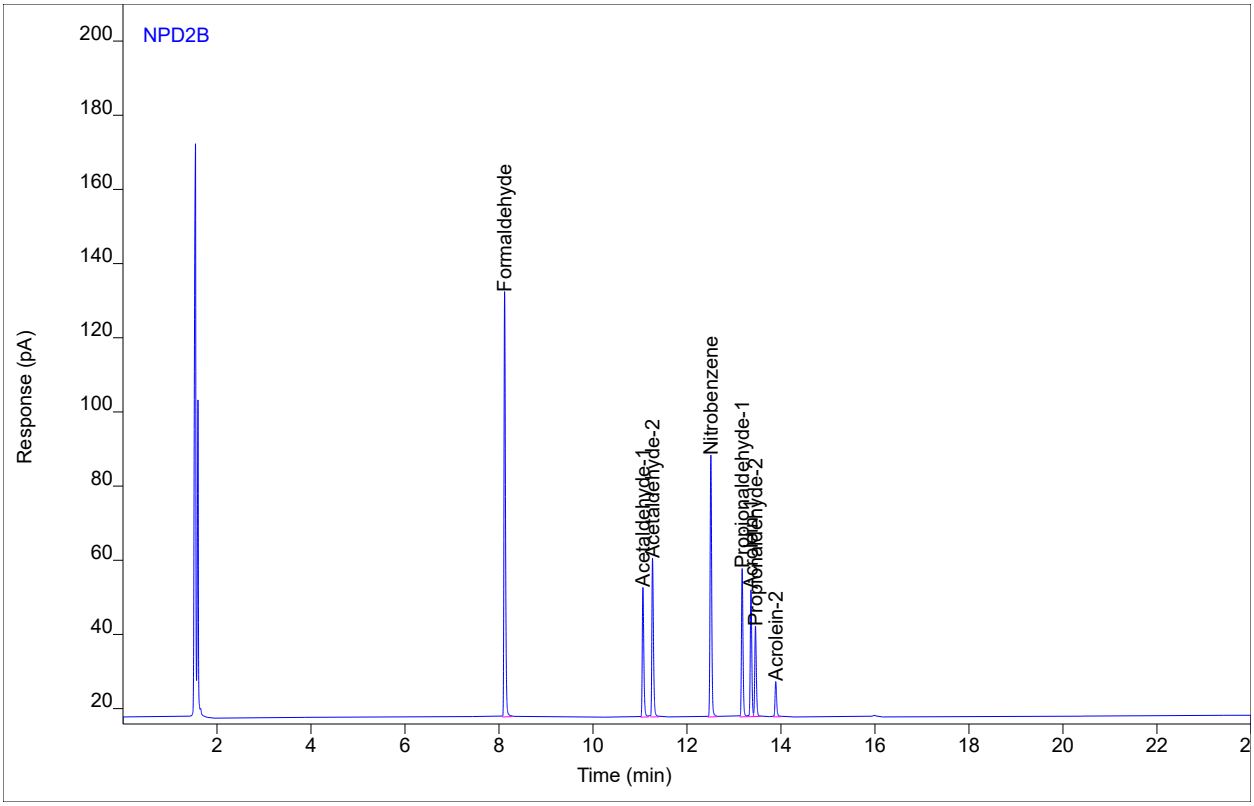
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Formaldehyde	VV	8.11	3363.71	1553.69	86.7490	1	86.7490	ug/ml
Nitrobenzene	BB	12.51	162.598	70.2877	100.000	1	100.000	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0463 ver.1
Inj Data File	040B1601.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 6:36 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



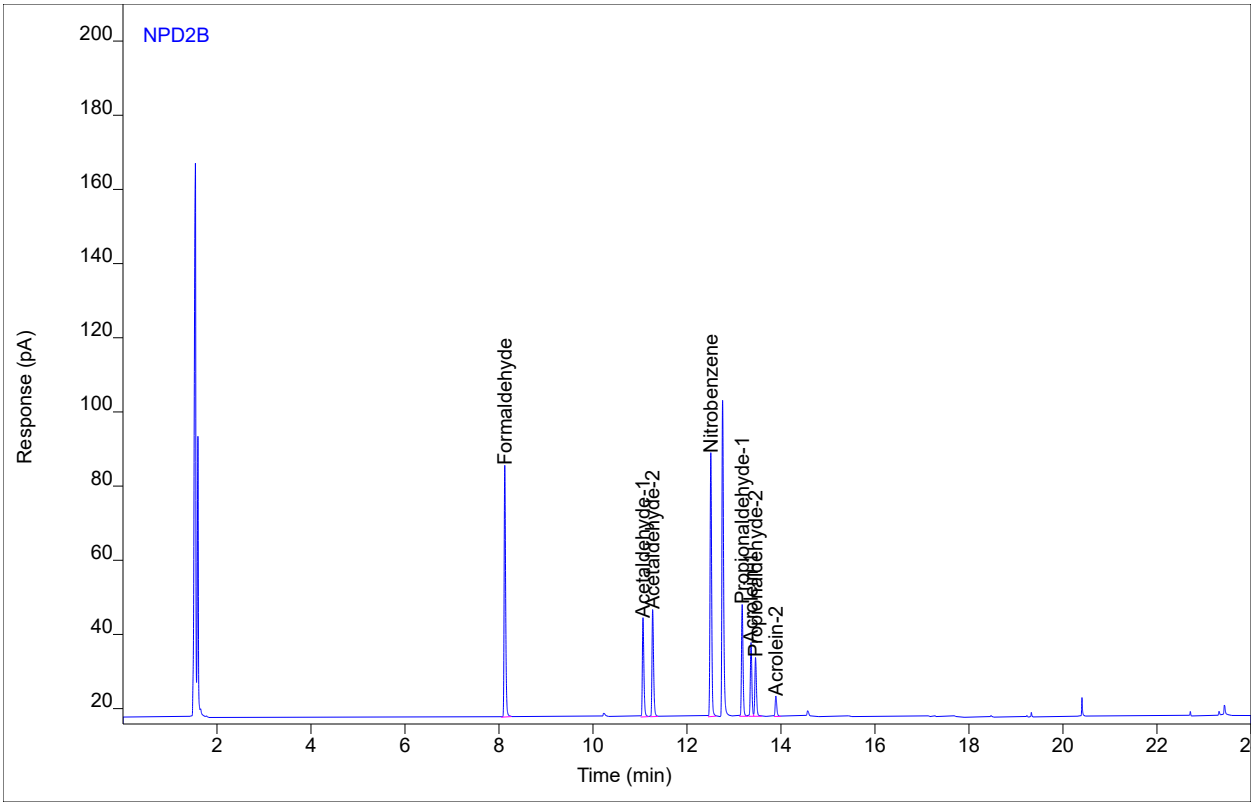
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				6.05708	1	6.05708	
Acrolein	Group				6.41330	1	6.41330	
Propionaldehyde	Group				6.22292	1	6.22292	
Formaldehyde	BB	8.12	250.599	114.709	6.34328	1	6.34328	ug/ml
Acetaldehyde-1	VV	11.06	80.5560	35.1768	2.69149	1	2.69149	ug/ml
Acetaldehyde-2	BV	11.27	100.732	42.8235	3.36559	1	3.36559	ug/ml
Nitrobenzene	BB	12.51	165.664	70.7003	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.17	90.1259	40.1408	3.80817	1	3.80817	ug/ml
Acrolein-1	VV	13.36	76.0256	34.3654	4.92389	1	4.92389	ug/ml
Propionaldehyde-2	VB	13.46	57.1484	24.4163	2.41474	1	2.41474	ug/ml
Acrolein-2	VB	13.89	22.9967	9.71206	1.48941	1	1.48941	ug/ml

Chromatogram Report

Sample Name	0623-263.F-L-SPK.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	034B1701.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 7:05 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 34
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



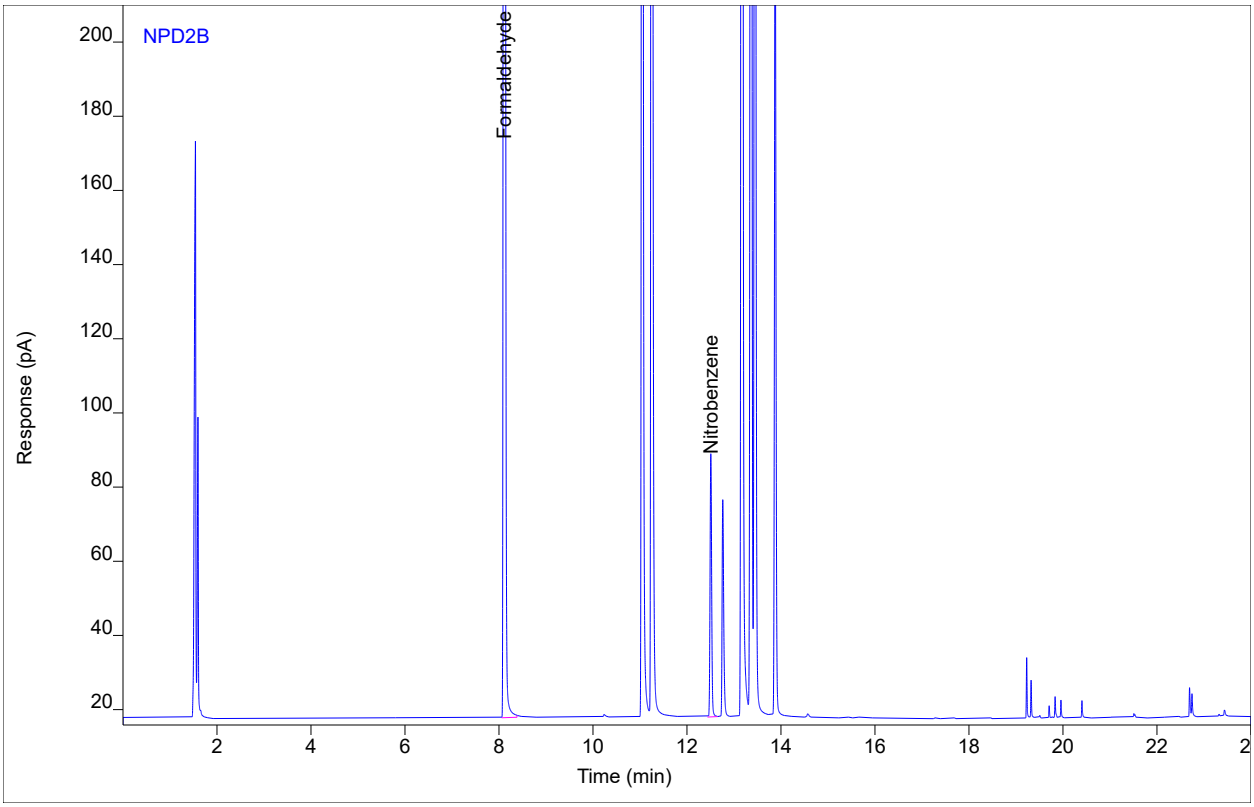
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				4.32593	1	4.32593	
Acrolein	Group				3.74452	1	3.74452	
Propionaldehyde	Group				4.51644	1	4.51644	
Formaldehyde	VB	8.12	148.204	67.9874	3.76551	1	3.76551	ug/ml
Acetaldehyde-1	VB	11.06	60.6724	26.7617	2.03477	1	2.03477	ug/ml
Acetaldehyde-2	VB	11.27	68.3178	29.0436	2.29117	1	2.29117	ug/ml
Nitrobenzene	VV	12.51	165.044	71.1774	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.17	68.8080	30.3282	2.91834	1	2.91834	ug/ml
Acrolein-1	BV	13.36	44.2742	19.8792	2.87825	1	2.87825	ug/ml
Propionaldehyde-2	VB	13.46	37.6799	15.9286	1.59811	1	1.59811	ug/ml
Acrolein-2	BB	13.89	13.3252	5.58137	0.86627	1	0.86627	ug/ml

Chromatogram Report

Sample Name	0623-263.F-H-SPK.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	035B1801.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 7:34 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 35
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



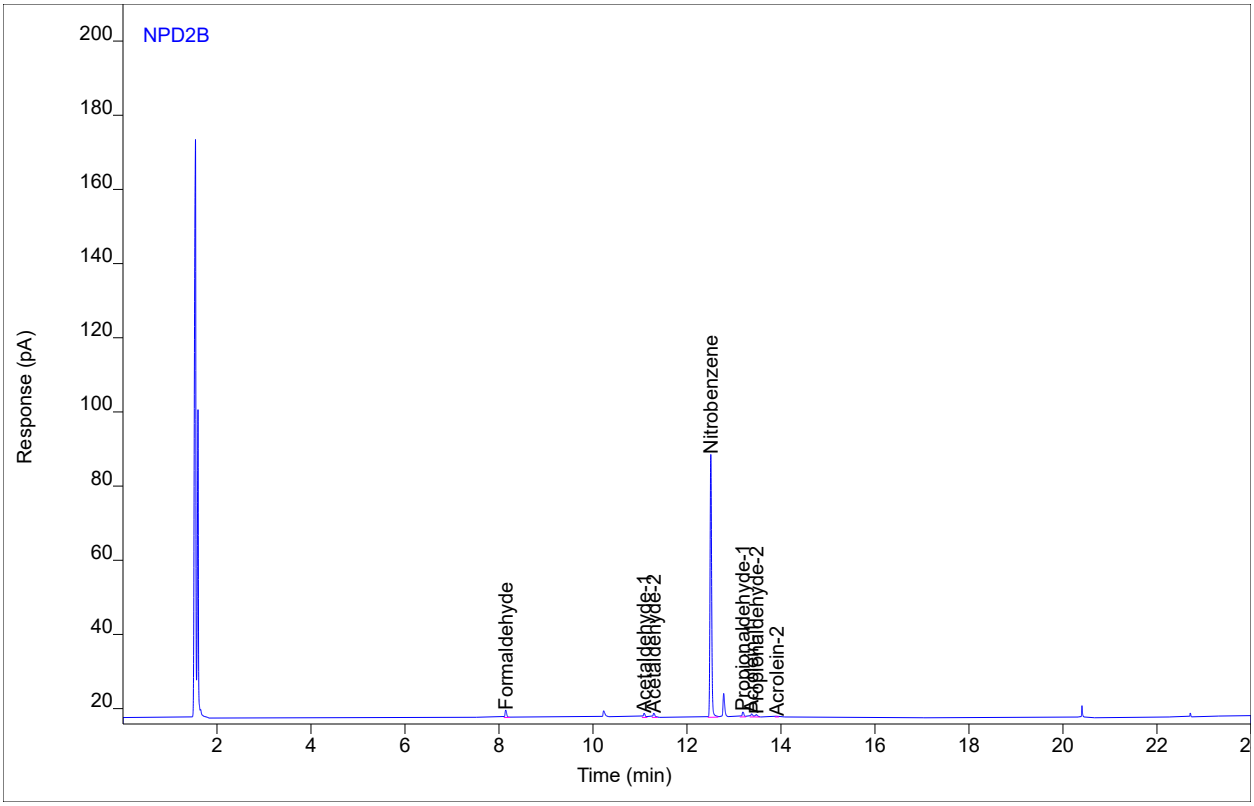
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Formaldehyde	BV	8.11	3322.22	1523.74	83.4589	1	83.4589	ug/ml
Nitrobenzene	BB	12.51	166.924	71.0069	100.000	1	100.000	ug/ml

Chromatogram Report

Sample Name	0623-263.BLK.HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	036B1901.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 8:03 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 36
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



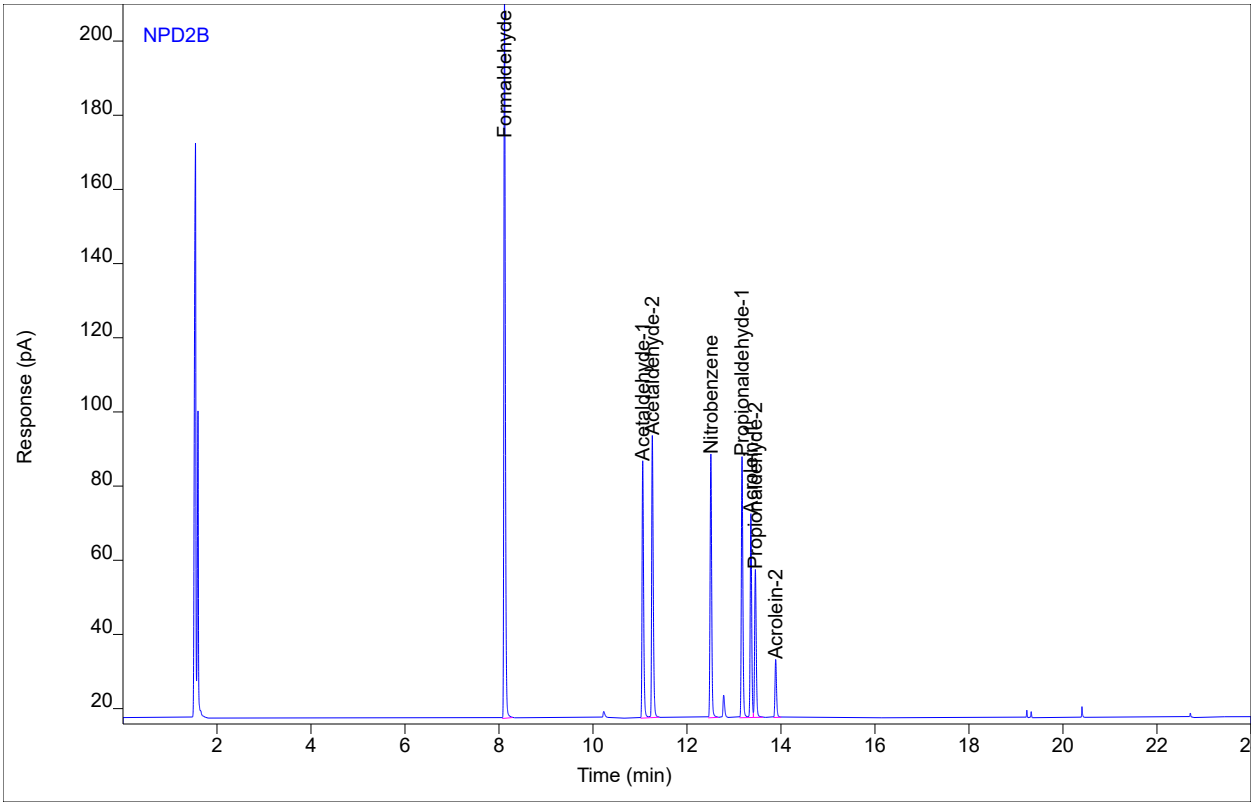
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				0.20818	1	0.20818	
Acrolein	Group				0.20582	1	0.20582	
Propionaldehyde	Group				0.24093	1	0.24093	
Formaldehyde	VB	8.14	4.90878	2.11868	0.12312	1	0.12312	ug/ml
Acetaldehyde-1	VV	11.09	3.06644	1.19891	0.10152	1	0.10152	ug/ml
Acetaldehyde-2	VV	11.30	3.22196	1.26525	0.10666	1	0.10666	ug/ml
Nitrobenzene	VV	12.51	167.195	71.0612	100.000	1	100.000	ug/ml
Propionaldehyde-1	VB	13.19	3.63264	1.50512	0.15209	1	0.15209	ug/ml
Acrolein-1	BV	13.38	2.44576	0.96332	0.15695	1	0.15695	ug/ml
Propionaldehyde-2	VV	13.48	2.12198	0.82926	0.08884	1	0.08884	ug/ml
Acrolein-2	VV	13.91	0.76153	0.29639	0.04887	1	0.04887	ug/ml

Chromatogram Report

Sample Name	gcprep5570 #LCS-L-HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	037B2001.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 8:32 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 37
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



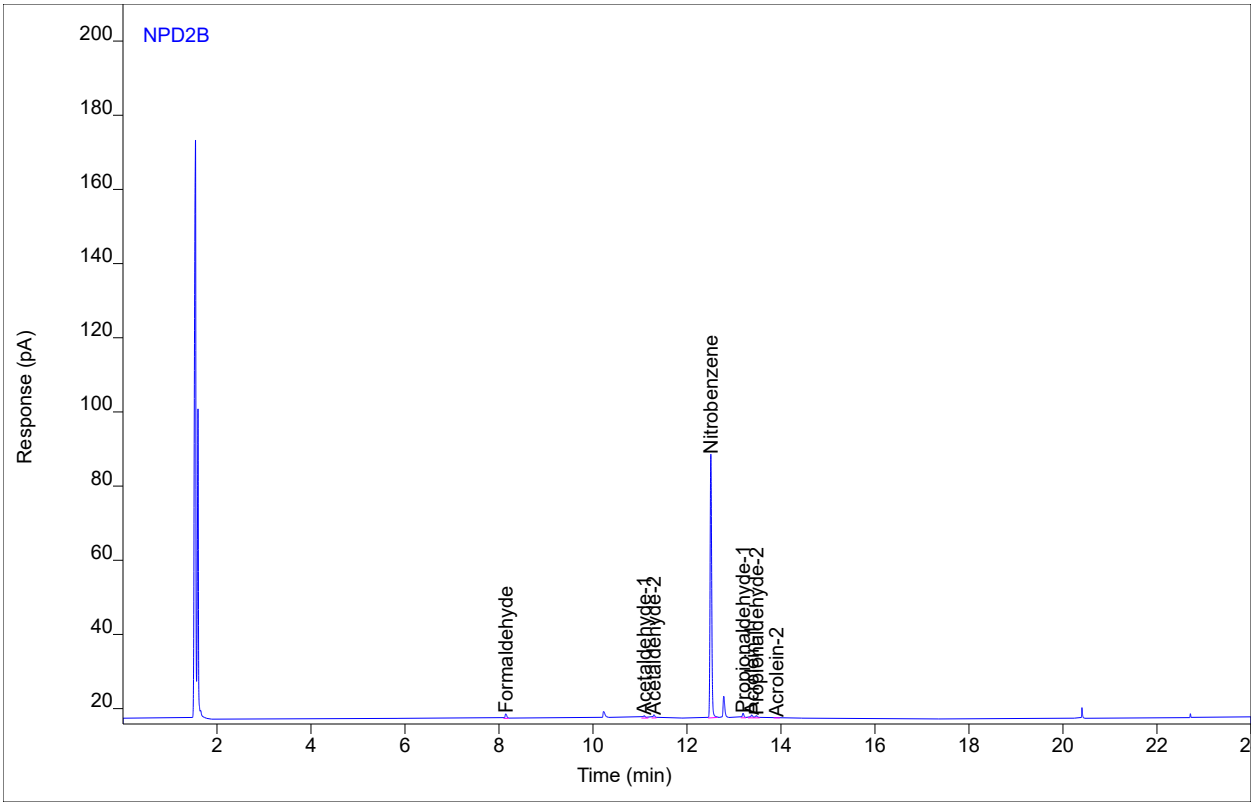
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				11.1795	1	11.1795	
Acrolein	Group				10.0527	1	10.0527	
Propionaldehyde	Group				10.7903	1	10.7903	
Formaldehyde	BB	8.12	420.595	194.055	10.6561	1	10.6561	ug/ml
Acetaldehyde-1	BB	11.06	158.148	69.4181	5.28879	1	5.28879	ug/ml
Acetaldehyde-2	BB	11.26	176.147	76.2163	5.89070	1	5.89070	ug/ml
Nitrobenzene	BB	12.51	165.512	71.1057	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.17	160.183	70.5275	6.77458	1	6.77458	ug/ml
Acrolein-1	VV	13.36	119.257	55.0100	7.73092	1	7.73092	ug/ml
Propionaldehyde-2	VB	13.46	94.9502	39.8956	4.01570	1	4.01570	ug/ml
Acrolein-2	BB	13.89	35.8165	15.7399	2.32183	1	2.32183	ug/ml

Chromatogram Report

Sample Name	gcprep5570 #MB-HEX
Sequence Name	LOLITA0463 ver.1
Inj Data File	039B2201.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 9:30 PM
File Modified	7/19/2023 11:27 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 39
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



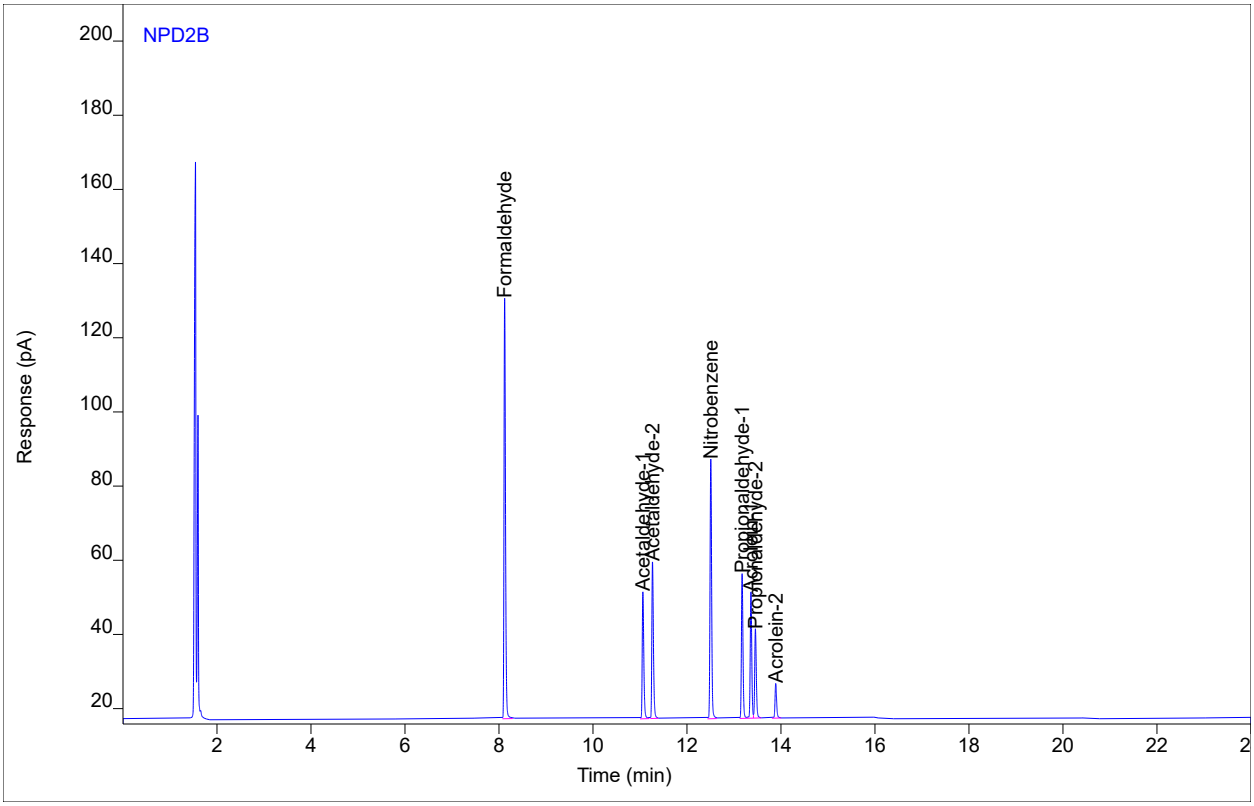
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				0.13225	1	0.13225	
Acrolein	Group				0.20360	1	0.20360	
Propionaldehyde	Group				0.21107	1	0.21107	
Formaldehyde	VV	8.15	3.27343	1.38335	0.08202	1	0.08202	ug/ml
Acetaldehyde-1	VV	11.09	1.88645	0.74385	0.06239	1	0.06239	ug/ml
Acetaldehyde-2	VV	11.30	2.11245	0.88448	0.06986	1	0.06986	ug/ml
Nitrobenzene	BV	12.51	167.360	71.1932	100.000	1	100.000	ug/ml
Propionaldehyde-1	VV	13.19	3.06467	1.24071	0.12818	1	0.12818	ug/ml
Acrolein-1	VV	13.38	2.25956	0.88862	0.14486	1	0.14486	ug/ml
Propionaldehyde-2	VV	13.48	1.98187	0.74292	0.08289	1	0.08289	ug/ml
Acrolein-2	BV	13.91	0.91629	0.27471	0.05874	1	0.05874	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0463 ver.1
Inj Data File	040B2301.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/19/2023 9:59 PM
File Modified	7/19/2023 11:28 PM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



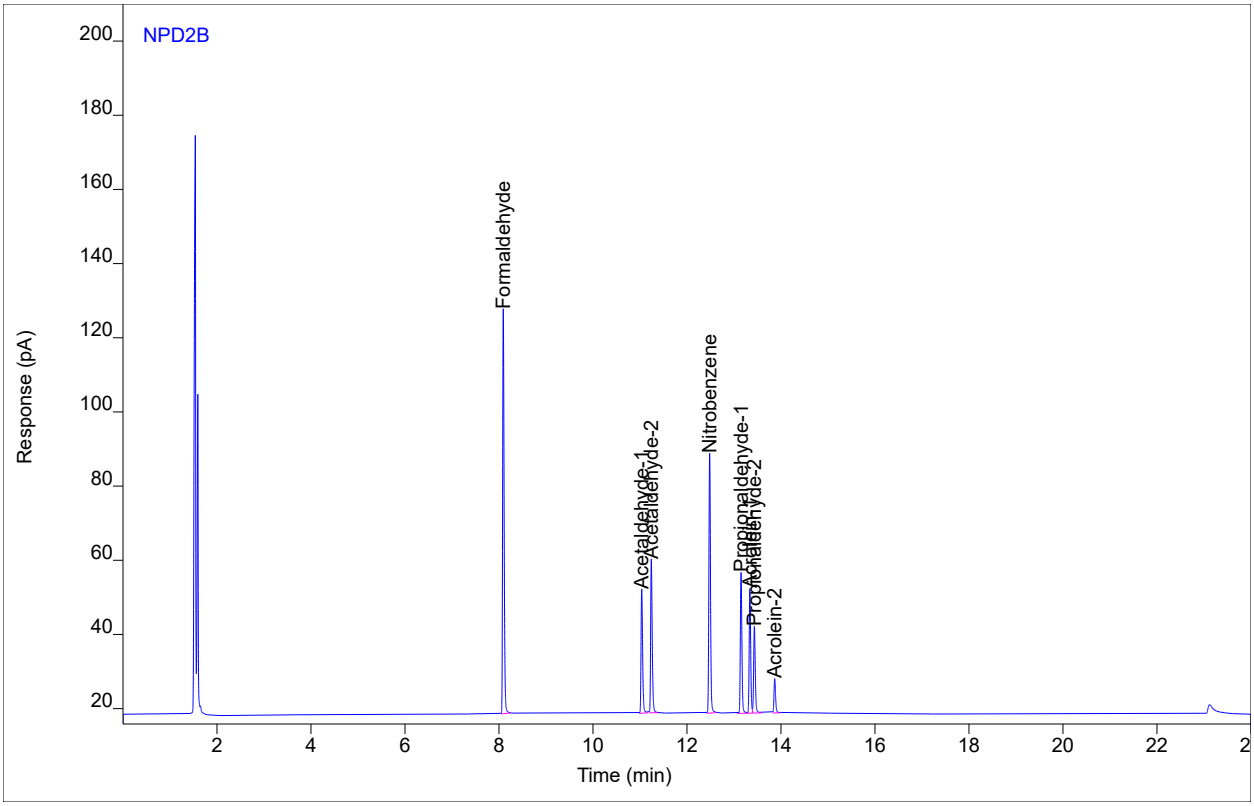
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				5.98543	1	5.98543	
Acrolein	Group				6.36738	1	6.36738	
Propionaldehyde	Group				6.20758	1	6.20758	
Formaldehyde	VB	8.12	248.887	113.390	6.33888	1	6.33888	ug/ml
Acetaldehyde-1	VV	11.06	79.6042	34.4210	2.67612	1	2.67612	ug/ml
Acetaldehyde-2	VV	11.27	98.4393	42.3530	3.30931	1	3.30931	ug/ml
Nitrobenzene	VV	12.51	164.646	70.1012	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.17	89.0694	39.2094	3.78679	1	3.78679	ug/ml
Acrolein-1	VV	13.36	75.5398	34.0534	4.92266	1	4.92266	ug/ml
Propionaldehyde-2	VB	13.46	56.9396	24.1098	2.42079	1	2.42079	ug/ml
Acrolein-2	BB	13.89	22.1698	9.53922	1.44472	1	1.44472	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0464 ver.1
Inj Data File	040B0201.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 12:02 PM
File Modified	7/25/2023 9:25 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



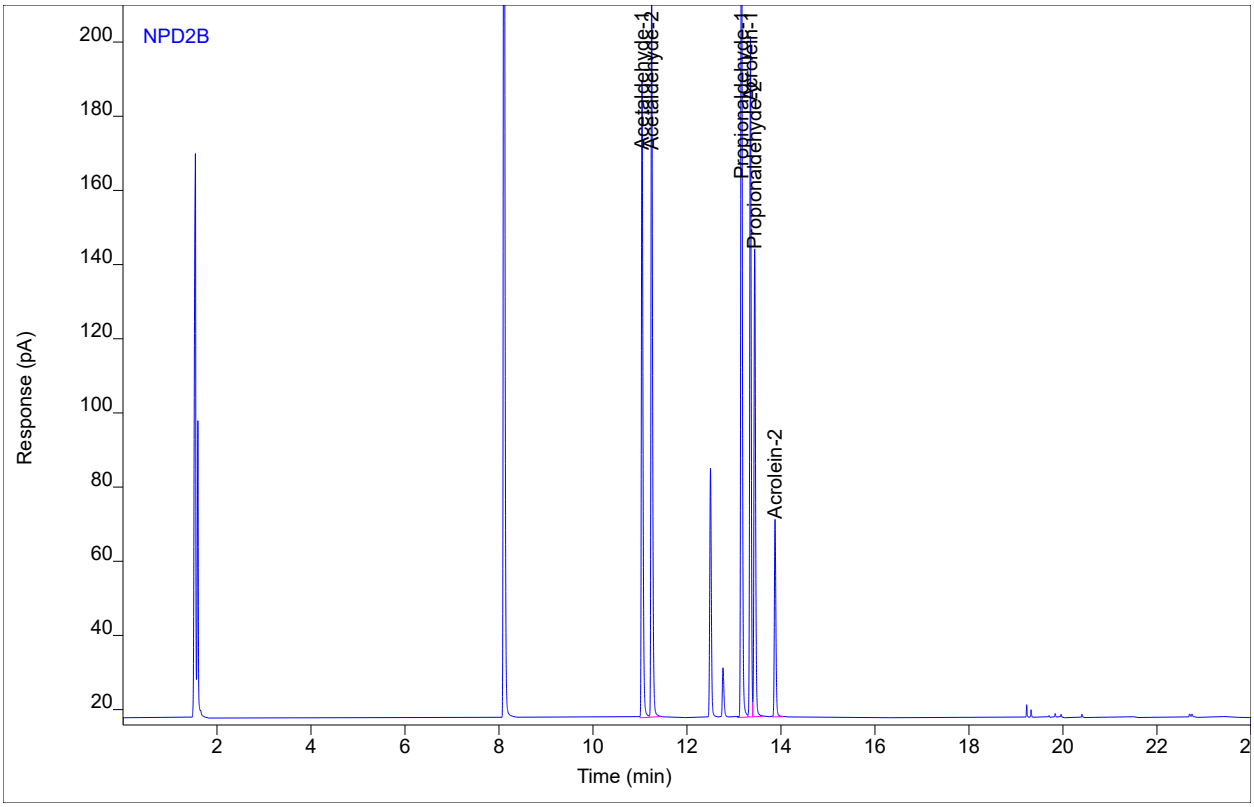
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				5.81766	1	5.81766	
Acrolein	Group				6.23955	1	6.23955	
Propionaldehyde	Group				6.08547	1	6.08547	
Formaldehyde	BB	8.09	238.780	109.203	6.05415	1	6.05415	ug/ml
Acetaldehyde-1	VB	11.04	77.9648	33.5368	2.60924	1	2.60924	ug/ml
Acetaldehyde-2	VB	11.24	95.8689	41.6011	3.20843	1	3.20843	ug/ml
Nitrobenzene	VB	12.48	165.389	70.2024	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.15	87.7750	38.2141	3.71500	1	3.71500	ug/ml
Acrolein-1	VV	13.34	74.3461	33.7667	4.82312	1	4.82312	ug/ml
Propionaldehyde-2	VB	13.43	56.0075	23.3963	2.37047	1	2.37047	ug/ml
Acrolein-2	BB	13.87	21.8336	9.40288	1.41643	1	1.41643	ug/ml

Chromatogram Report

Sample Name	0623-263.F-H-SPK.HEX
Sequence Name	LOLITA0464 ver.1
Inj Data File	042B0401.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 1:00 PM
File Modified	7/25/2023 9:25 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 42
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



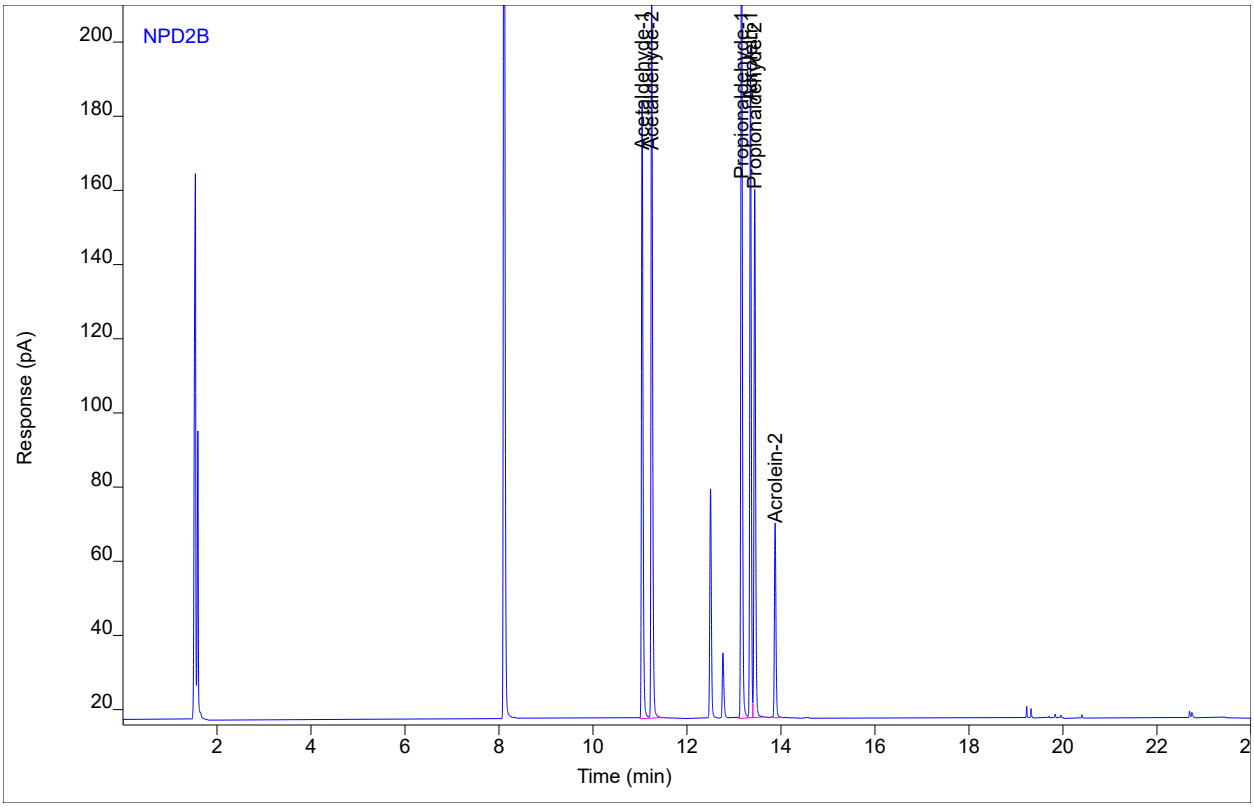
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				30.1567	4	120.627	
Acrolein	Group				35.4572	4	141.829	
Propionaldehyde	Group				38.7969	4	155.188	
Acetaldehyde-1	VV	11.04	393.969	171.993	13.9376	4	55.7506	ug/ml
Acetaldehyde-2	VB	11.25	458.458	198.013	16.2191	4	64.8764	ug/ml
Propionaldehyde-1	BV	13.16	572.396	250.112	25.6093	4	102.437	ug/ml
Acrolein-1	VV	13.35	396.779	183.568	27.2101	4	108.840	ug/ml
Propionaldehyde-2	VB	13.44	294.759	126.153	13.1877	4	52.7506	ug/ml
Acrolein-2	BB	13.87	120.259	53.4011	8.24710	4	32.9884	ug/ml

Chromatogram Report

Sample Name	0623-263.TS.HEX
Sequence Name	LOLITA0464 ver.1
Inj Data File	043B0501.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 1:29 PM
File Modified	7/25/2023 9:25 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 43
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



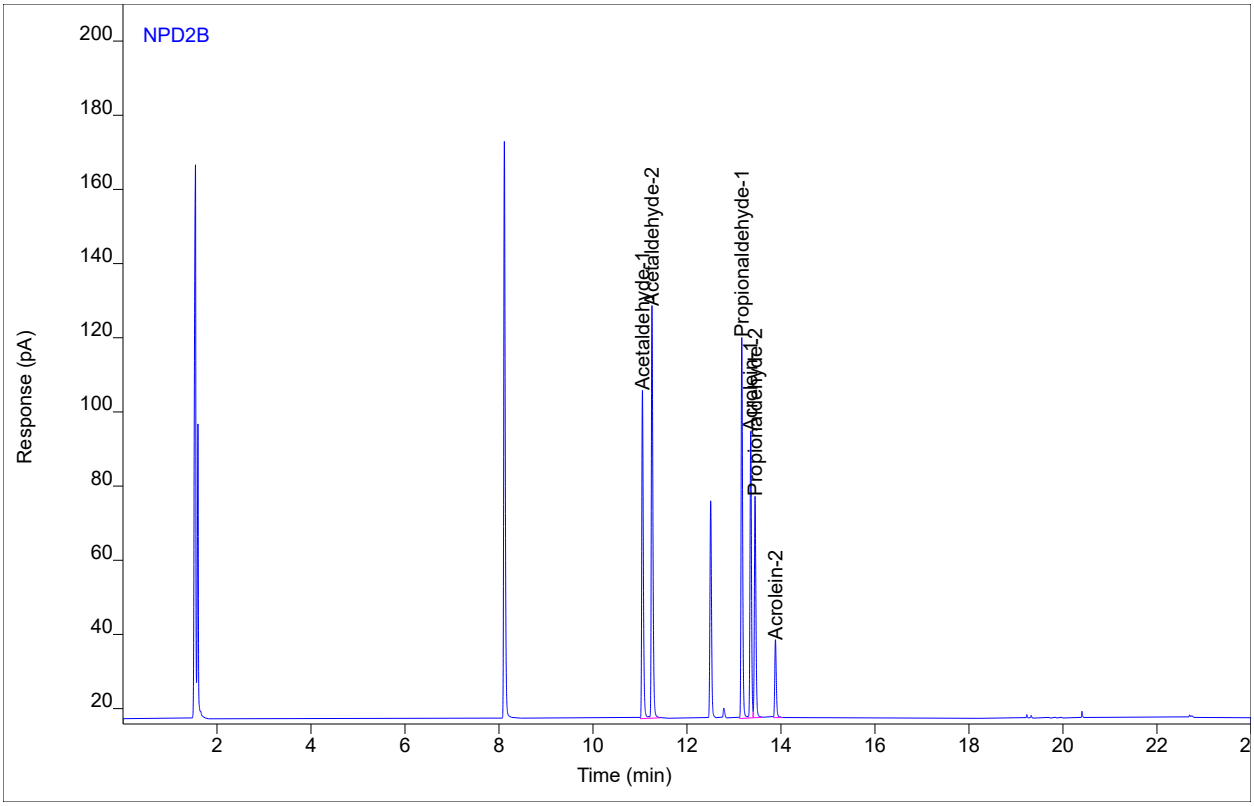
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				32.7481	4	130.993	
Acrolein	Group				38.2834	4	153.134	
Propionaldehyde	Group				42.2666	4	169.066	
Acetaldehyde-1	VV	11.05	382.473	166.512	14.7332	4	58.9327	ug/ml
Acetaldehyde-2	VB	11.25	467.667	202.981	18.0150	4	72.0598	ug/ml
Propionaldehyde-1	BV	13.16	540.329	242.030	26.3225	4	105.290	ug/ml
Acrolein-1	VV	13.35	393.199	180.772	29.3605	4	117.442	ug/ml
Propionaldehyde-2	VB	13.44	327.288	142.391	15.9441	4	63.7762	ug/ml
Acrolein-2	BB	13.88	119.497	52.5564	8.92296	4	35.6919	ug/ml

Chromatogram Report

Sample Name	0623-263.R3-H-SPK.HEX
Sequence Name	LOLITA0464 ver.1
Inj Data File	044B0601.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 1:58 PM
File Modified	7/25/2023 9:25 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 44
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



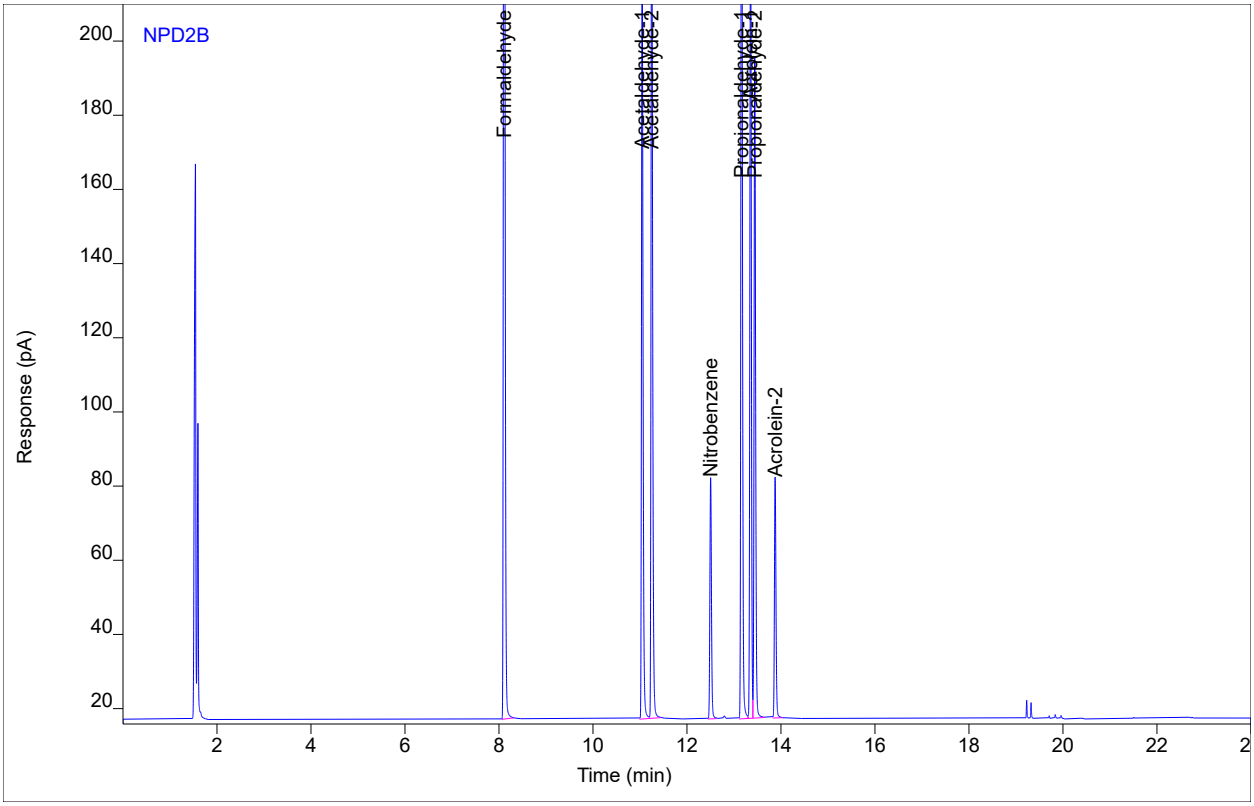
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				18.7448	10	187.448	
Acrolein	Group				16.9553	10	169.553	
Propionaldehyde	Group				18.9087	10	189.087	
Acetaldehyde-1	VB	11.05	204.084	88.5547	8.25613	10	82.5613	ug/ml
Acetaldehyde-2	BB	11.26	259.269	111.393	10.4886	10	104.886	ug/ml
Propionaldehyde-1	BV	13.17	232.856	102.884	11.9132	10	119.132	ug/ml
Acrolein-1	VV	13.36	168.011	77.3233	13.1753	10	131.753	ug/ml
Propionaldehyde-2	VB	13.45	136.734	59.9312	6.99549	10	69.9549	ug/ml
Acrolein-2	BB	13.88	48.2026	21.0482	3.78002	10	37.8002	ug/ml

Chromatogram Report

Sample Name	gcprep5570 #LCS-H-HEX
Sequence Name	LOLITA0464 ver.1
Inj Data File	045B0701.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 2:27 PM
File Modified	7/25/2023 9:25 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Sample
Vial Number	Vial 45
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



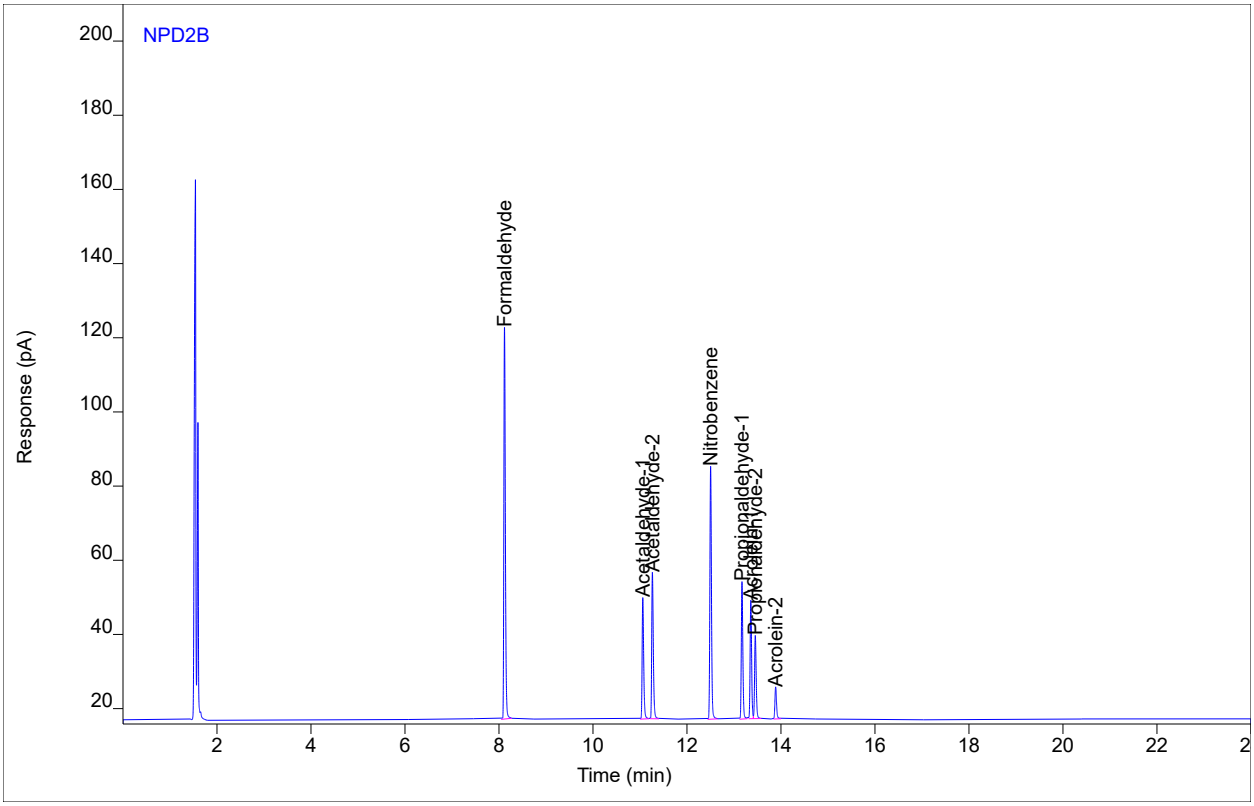
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				37.8618	10	378.618	
Acrolein	Group				45.0686	10	450.686	
Propionaldehyde	Group				48.9565	10	489.565	
Formaldehyde	BB	8.11	947.649	438.202	26.3258	10	263.258	ug/ml
Acetaldehyde-1	VV	11.05	468.455	205.772	17.1776	10	171.776	ug/ml
Acetaldehyde-2	VB	11.25	564.087	246.798	20.6842	10	206.842	ug/ml
Nitrobenzene	BV	12.50	150.948	65.2179	10.0000	10	100.000	ug/ml
Propionaldehyde-1	BV	13.16	648.220	290.959	30.0600	10	300.600	ug/ml
Acrolein-1	VV	13.35	487.919	224.075	34.6814	10	346.814	ug/ml
Propionaldehyde-2	VB	13.44	407.488	178.466	18.8965	10	188.965	ug/ml
Acrolein-2	VB	13.88	146.134	65.0541	10.3873	10	103.873	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0464 ver.1
Inj Data File	040B0801.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	7/24/2023 2:56 PM
File Modified	7/25/2023 9:26 AM
Instrument	Lolita
Operator	Aaron Petersen

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 40
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	7/25/2023 12:44 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				5.85760	1	5.85760	
Acrolein	Group				6.19050	1	6.19050	
Propionaldehyde	Group				6.04048	1	6.04048	
Formaldehyde	VB	8.12	232.166	105.637	6.17116	1	6.17116	ug/ml
Acetaldehyde-1	VB	11.06	74.6896	32.8949	2.62052	1	2.62052	ug/ml
Acetaldehyde-2	BV	11.26	92.2625	39.5139	3.23707	1	3.23707	ug/ml
Nitrobenzene	VB	12.50	157.759	68.3392	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.17	83.2462	37.1908	3.69373	1	3.69373	ug/ml
Acrolein-1	BV	13.36	70.3059	31.9619	4.78161	1	4.78161	ug/ml
Propionaldehyde-2	VB	13.45	52.8890	22.4813	2.34675	1	2.34675	ug/ml
Acrolein-2	BB	13.89	20.7154	8.69140	1.40889	1	1.40889	ug/ml

Calibration Table

Calib. Data Modified : Monday, June 26, 2023 12:20:37 PM

Rel. Reference Window : 0.000 %
Abs. Reference Window : 0.200 min
Rel. Non-ref. Window : 0.000 %
Abs. Non-ref. Window : 0.200 min
Uncalibrated Peaks : not reported
Partial Calibration : Yes, identified peaks are recalibrated
Correct All Ret. Times: No, only for identified peaks

Curve Type : Average Response/Amount
Origin : Ignored
Weight : Equal

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount [ug/ml]	Name
1	100.00000	Nitrobenzene

Signal 1: NPD2 B,

RetTime [min]	Sig	Lvl	Amount [ug/ml]	Area	Amt/Area	Ref Grp	Name
8.138	1	1	4.85074e-1	16.36321	2.96442e-2	1	Formaldehyde
		2	2.52220	83.14323	3.03356e-2		
		3	6.03567	210.03967	2.87359e-2		
		4	12.01158	455.22662	2.63859e-2		
		5	29.58915	1042.53992	2.83818e-2		
		6	57.77000	2076.06104	2.78267e-2		
		7	110.28818	4080.39404	2.70288e-2		
11.085	1	1	2.05061e-1	5.61247	3.65367e-2	1	1 Acetaldehyde-1
		2	1.09480	27.99113	3.91125e-2		
		3	2.62140	68.14464	3.84681e-2		
		4	5.20328	148.62059	3.50105e-2		
		5	12.77683	333.11761	3.83553e-2		
		6	24.90202	661.56635	3.76410e-2		
		7	47.30046	1293.97083	3.65545e-2		
11.291	1	1	2.67939e-1	7.33343	3.65367e-2	1	1 Acetaldehyde-2

RetTime [min]	Sig	Lvl	Amount [ug/ml]	Area	Amt/Area	Ref	Grp	Name
		2	1.36720	34.95557	3.91125e-2			
		3	3.26960	84.99519	3.84681e-2			
		4	6.52072	186.25031	3.50105e-2			
		5	16.10417	419.86819	3.83553e-2			
		6	31.48498	836.45410	3.76410e-2			
		7	60.34954	1650.94678	3.65545e-2			
12.514	1	1	100.00000	144.90929	6.90087e-1	I1		Nitrobenzene
		2	100.00000	143.58173	6.96467e-1			
		3	100.00000	144.10732	6.93927e-1			
		4	100.00000	159.96103	6.25152e-1			
		5	100.00000	146.16470	6.84160e-1			
		6	100.00000	147.56770	6.77655e-1			
		7	100.00000	151.67018	6.59325e-1			
13.191	1	1	2.81412e-1	6.02810	4.66833e-2	1	2	Propionaldehyde-1
		2	1.52720	30.07953	5.07721e-2			
		3	3.65560	76.35092	4.78789e-2			
		4	7.23230	162.19019	4.45915e-2			
		5	17.77151	368.06042	4.82842e-2			
		6	34.59930	733.82892	4.71490e-2			
		7	65.51278	1435.39624	4.56409e-2			
13.377	1	1	3.88994e-1	5.12206	7.59449e-2	1	3	Acrolein-1
		2	1.97084	25.57232	7.70692e-2			
		3	4.79562	65.14576	7.36137e-2			
		4	9.49384	140.42151	6.76096e-2			
		5	23.40001	320.67676	7.29707e-2			
		6	45.64961	640.73010	7.12462e-2			
		7	86.85206	1258.95776	6.89873e-2			
13.476	1	1	2.00588e-1	4.29678	4.66833e-2	1	2	Propionaldehyde-2
		2	9.80800e-1	19.31771	5.07721e-2			
		3	2.34440	48.96522	4.78789e-2			
		4	4.71070	105.64125	4.45915e-2			
		5	11.65049	241.28981	4.82842e-2			
		6	22.84370	484.50018	4.71490e-2			
		7	44.14722	967.27332	4.56409e-2			
13.906	1	1	1.10006e-1	1.44849	7.59449e-2	1	3	Acrolein-2
		2	6.22161e-1	8.07276	7.70692e-2			
		3	1.41038	19.15918	7.36137e-2			
		4	2.85616	42.24499	6.76096e-2			
		5	7.02399	96.25770	7.29707e-2			
		6	13.75039	192.99820	7.12462e-2			
		7	26.54794	384.82370	6.89873e-2			

Group summary :

Group 1 (Acetaldehyde) :
Group members:
Acetaldehyde-1 with retention time 11.085 min
Acetaldehyde-2 with retention time 11.291 min
Group Amount Calculation:
Level 1 with amount 0.47300 ug/ml
Level 2 with amount 2.46200 ug/ml
Level 3 with amount 5.89100 ug/ml
Level 4 with amount 11.72400 ug/ml
Level 5 with amount 28.88100 ug/ml
Level 6 with amount 56.38700 ug/ml

Level 7 with amount 107.65000 ug/ml
Group 2 (Propionaldehyde) :
Group members:
Propionaldehyde-1 with retention time 13.191 min
Propionaldehyde-2 with retention time 13.476 min
Group Amount Calculation:
Level 1 with amount 0.48200 ug/ml
Level 2 with amount 2.50800 ug/ml
Level 3 with amount 6.00000 ug/ml
Level 4 with amount 11.94300 ug/ml
Level 5 with amount 29.42200 ug/ml
Level 6 with amount 57.44300 ug/ml
Level 7 with amount 109.66000 ug/ml
Group 3 (Acrolein) :
Group members:
Acrolein-1 with retention time 13.377 min
Acrolein-2 with retention time 13.906 min
Group Amount Calculation:
Level 1 with amount 0.49900 ug/ml
Level 2 with amount 2.59300 ug/ml
Level 3 with amount 6.20600 ug/ml
Level 4 with amount 12.35000 ug/ml
Level 5 with amount 30.42400 ug/ml
Level 6 with amount 59.40000 ug/ml
Level 7 with amount 113.40000 ug/ml

2 Warnings or Errors :

Warning : Overlapping peak time windows at 13.191 min, signal 1
Warning : Overlapping peak time windows at 13.377 min, signal 1

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Peak Sum Table

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No Entries in table

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Calibration Curves

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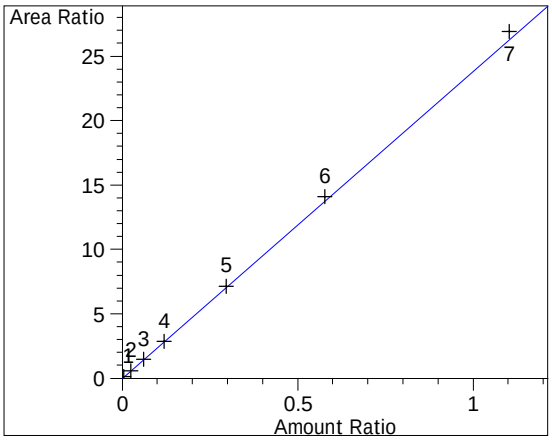
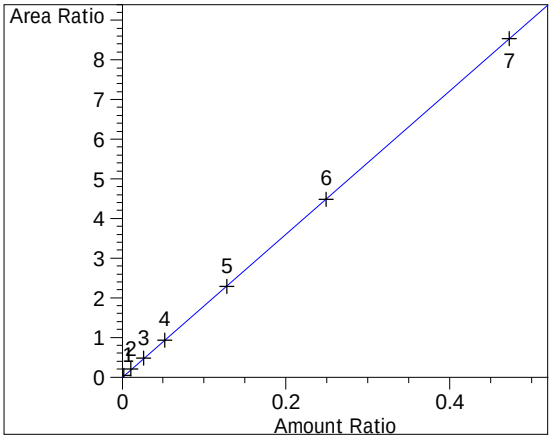
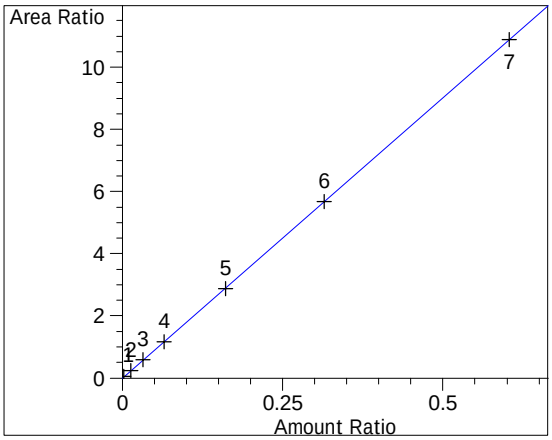


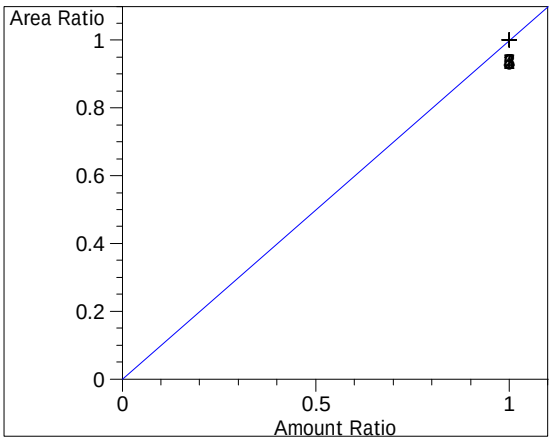
Formaldehyde at exp. RT: 8.138
NPD2 B,
Correlation: 0.99999
Residual Std. Dev.: 0.30172
Formula: y = mx
m: 23.84722
x: Amount
y: Area



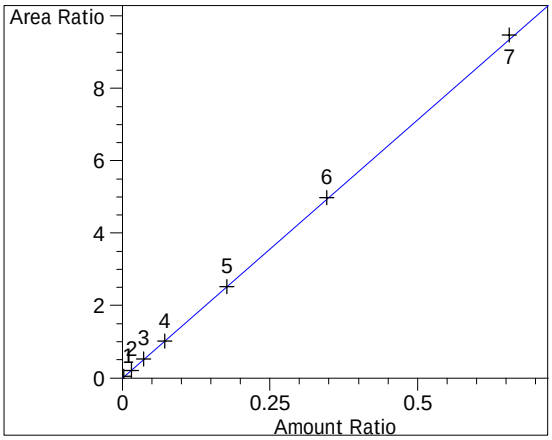
Acetaldehyde-1 at exp. RT: 11.085
NPD2 B,
Correlation: 1.00000
Residual Std. Dev.: 0.01697
Formula: y = mx
m: 18.06668
x: Amount
y: Area



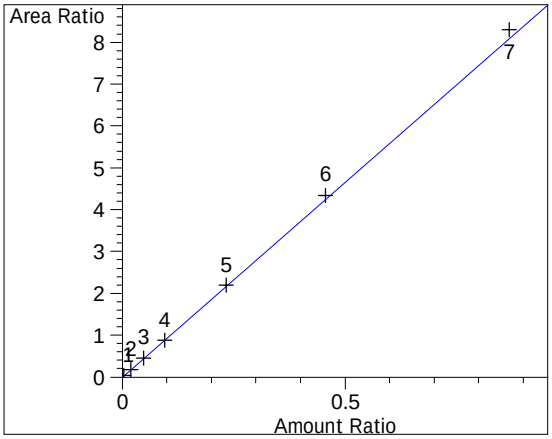
Acetaldehyde-2 at exp. RT: 11.291
NPD2 B,
Correlation: 1.00000
Residual Std. Dev.: 0.02143
Formula: y = mx
m: 18.06668
x: Amount
y: Area



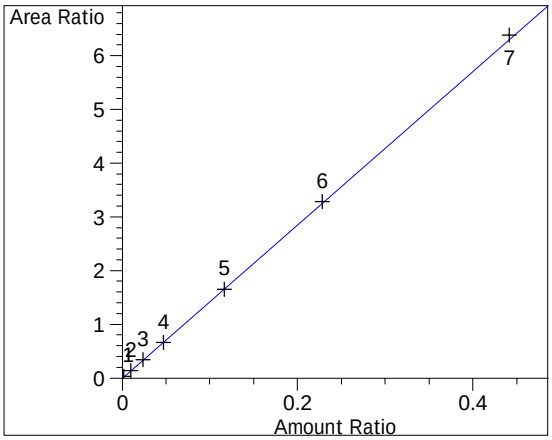
Nitrobenzene at exp. RT: 12.514
NPD2 B,
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: y = mx
m: 1.00000
x: Amount
y: Area



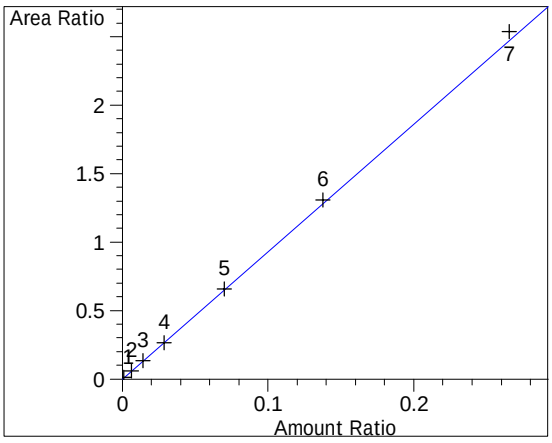
Propionaldehyde-1 at exp. RT: 13.191
NPD2 B,
Correlation: 0.99998
Residual Std. Dev.: 0.05067
Formula: y = mx
m: 14.28582
x: Amount
y: Area



Acrolein-1 at exp. RT: 13.377
NPD2 B,
Correlation: 0.99999
Residual Std. Dev.: 0.10028
Formula: y = mx
m: 9.32017
x: Amount
y: Area



Propionaldehyde-2 at exp. RT: 13.476
NPD2 B,
Correlation: 0.99998
Residual Std. Dev.: 0.03402
Formula: y = mx
m: 14.28582
x: Amount
y: Area



Acrolein-2 at exp. RT: 13.906
NPD2 B,
Correlation: 0.99999
Residual Std. Dev.: 0.03058
Formula: y = mx
m: 9.32017
x: Amount
y: Area

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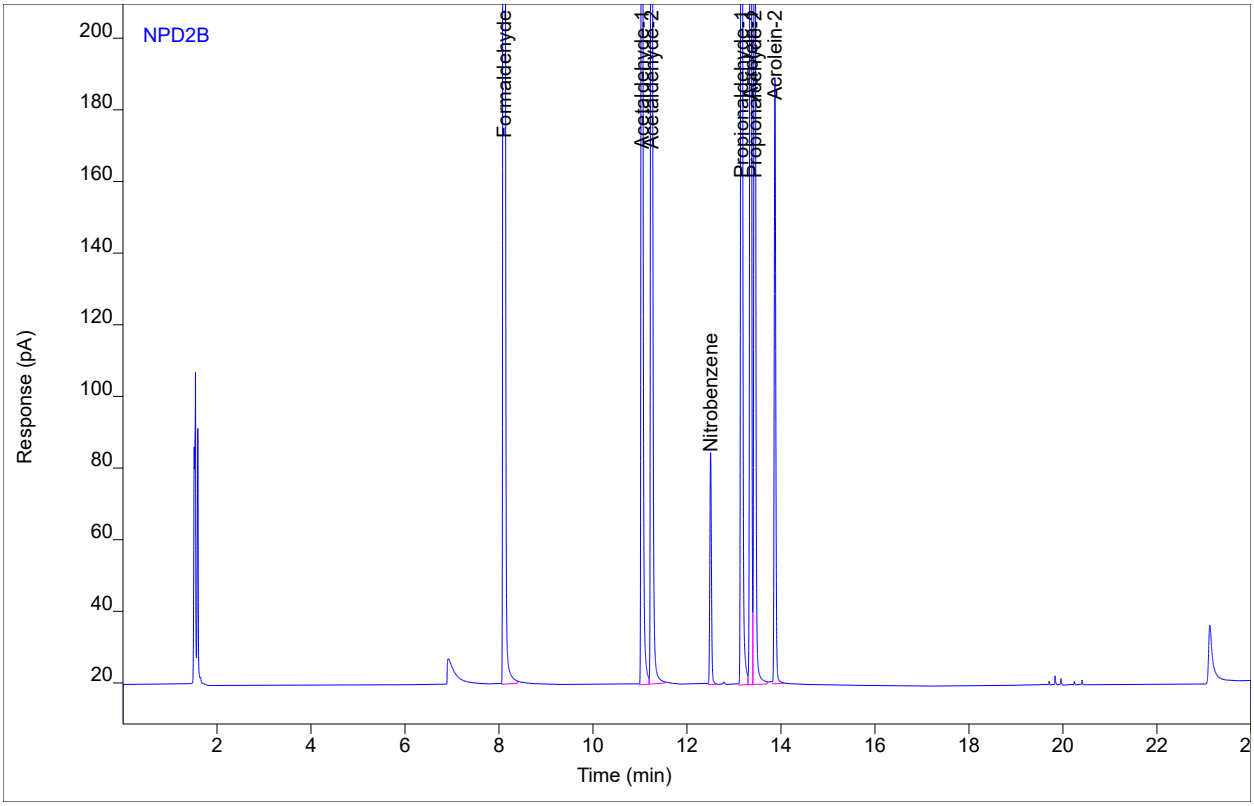
Chromatogram Report

Sample Name	gcstds1919 #7
Sequence Name	LOLITA0458 ver.5
Inj Data File	026B0201.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 10:22 AM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 26
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



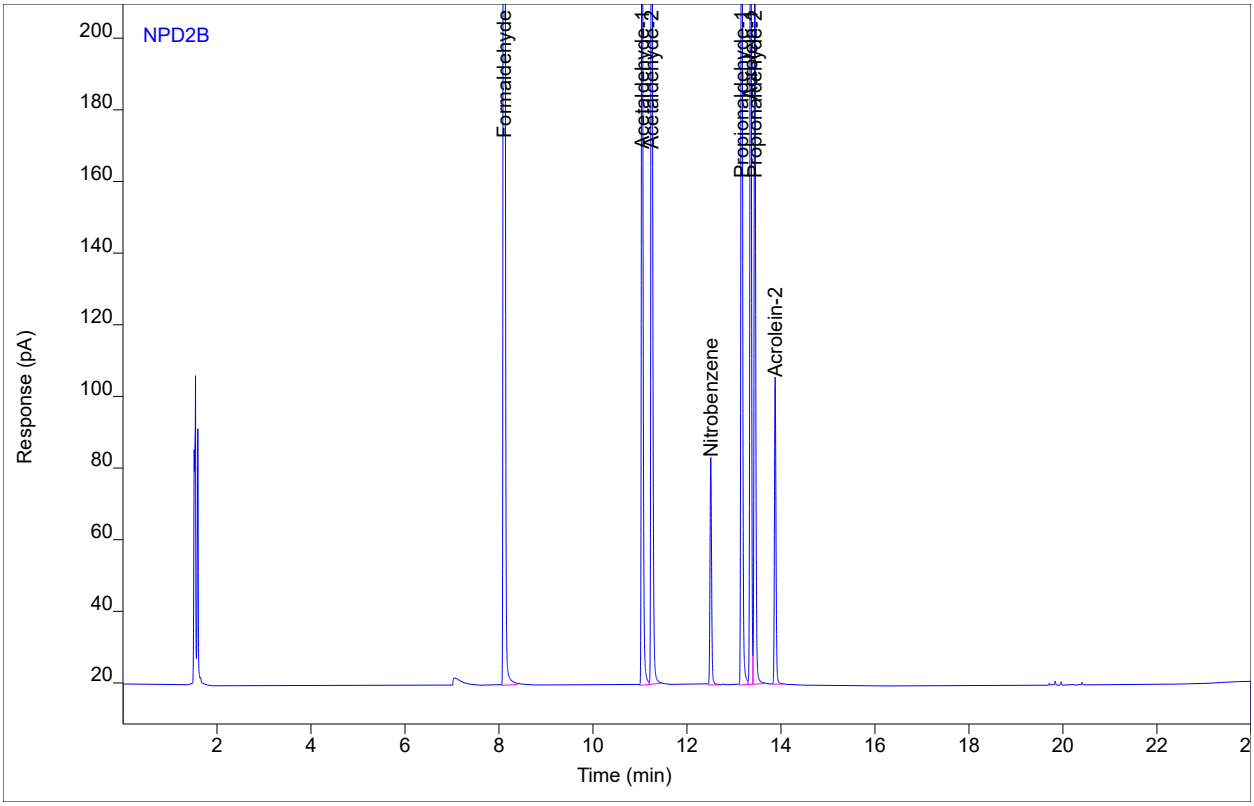
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				107.472	1	107.472	
Acrolein	Group				116.284	1	116.284	
Propionaldehyde	Group				110.889	1	110.889	
Formaldehyde	VV	8.11	4080.39	1843.91	112.814	1	112.814	ug/ml
Acetaldehyde-1	VV	11.04	1293.97	560.848	47.2222	1	47.2222	ug/ml
Acetaldehyde-2	VV	11.25	1650.95	720.260	60.2496	1	60.2496	ug/ml
Nitrobenzene	VV	12.50	151.670	64.9038	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.16	1435.40	623.964	66.2470	1	66.2470	ug/ml
Acrolein-1	VV	13.36	1258.96	566.521	89.0609	1	89.0609	ug/ml
Propionaldehyde-2	VV	13.44	967.273	414.382	44.6420	1	44.6420	ug/ml
Acrolein-2	BB	13.87	384.824	169.198	27.2231	1	27.2231	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #6
Sequence Name	LOLITA0458 ver.5
Inj Data File	027B0301.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 10:51 AM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 27
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



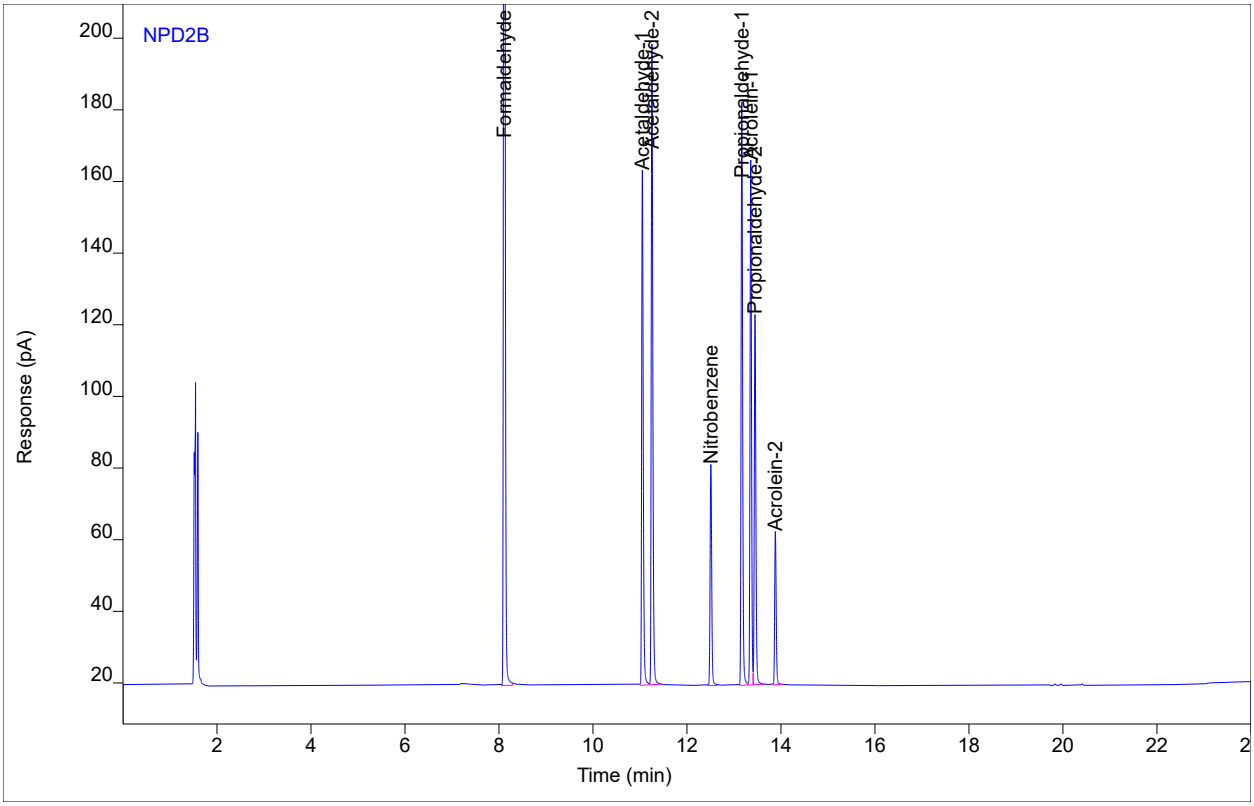
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				56.1886	1	56.1886	
Acrolein	Group				60.6191	1	60.6191	
Propionaldehyde	Group				57.7921	1	57.7921	
Formaldehyde	BB	8.11	2076.06	959.118	58.9944	1	58.9944	ug/ml
Acetaldehyde-1	VV	11.05	661.566	291.454	24.8144	1	24.8144	ug/ml
Acetaldehyde-2	VB	11.25	836.454	363.290	31.3742	1	31.3742	ug/ml
Nitrobenzene	VB	12.51	147.568	63.6662	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.16	733.829	317.726	34.8095	1	34.8095	ug/ml
Acrolein-1	VV	13.36	640.730	294.351	46.5865	1	46.5865	ug/ml
Propionaldehyde-2	VB	13.44	484.500	207.527	22.9825	1	22.9825	ug/ml
Acrolein-2	BB	13.88	192.998	85.7424	14.0326	1	14.0326	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #5
Sequence Name	LOLITA0458 ver.5
Inj Data File	028B0401.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 11:20 AM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 28
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



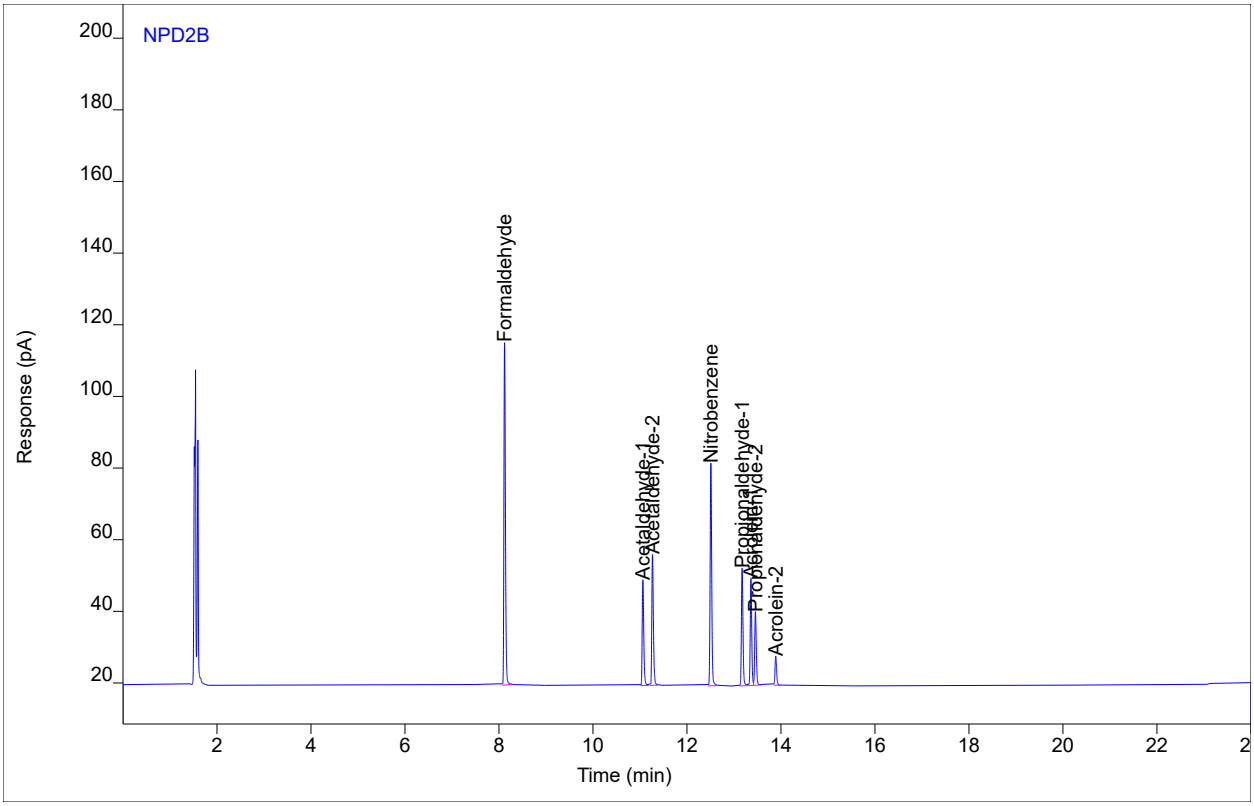
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				28.5145	1	28.5145	
Acrolein	Group				30.6056	1	30.6056	
Propionaldehyde	Group				29.1823	1	29.1823	
Formaldehyde	BV	8.11	1042.54	477.407	29.9097	1	29.9097	ug/ml
Acetaldehyde-1	VV	11.05	333.118	143.865	12.6147	1	12.6147	ug/ml
Acetaldehyde-2	VB	11.25	419.868	178.935	15.8998	1	15.8998	ug/ml
Nitrobenzene	VB	12.51	146.165	61.9394	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.17	368.060	162.822	17.6267	1	17.6267	ug/ml
Acrolein-1	VV	13.36	320.677	146.582	23.5397	1	23.5397	ug/ml
Propionaldehyde-2	VB	13.45	241.290	103.539	11.5556	1	11.5556	ug/ml
Acrolein-2	BB	13.88	96.2577	42.9174	7.06593	1	7.06593	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #3
Sequence Name	LOLITA0458 ver.5
Inj Data File	029B0501.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 11:49 AM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 29
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



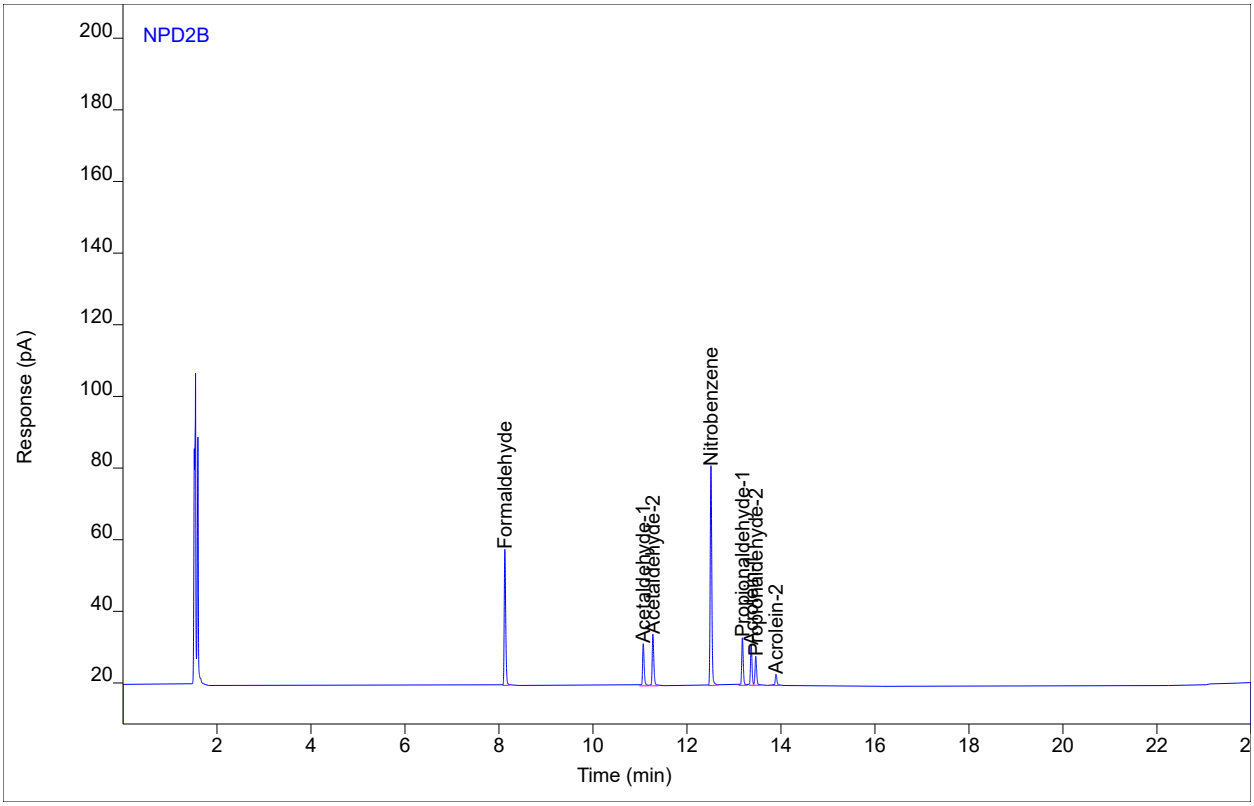
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				5.88198	1	5.88198	
Acrolein	Group				6.27687	1	6.27687	
Propionaldehyde	Group				6.08718	1	6.08718	
Formaldehyde	VB	8.12	210.040	95.7618	6.11192	1	6.11192	ug/ml
Acetaldehyde-1	VV	11.06	68.1446	29.5525	2.61738	1	2.61738	ug/ml
Acetaldehyde-2	VV	11.27	84.9952	36.6892	3.26460	1	3.26460	ug/ml
Nitrobenzene	VB	12.51	144.107	62.1817	100.000	1	100.000	ug/ml
Propionaldehyde-1	VB	13.17	76.3509	32.8412	3.70871	1	3.70871	ug/ml
Acrolein-1	BV	13.36	65.1458	29.8954	4.85039	1	4.85039	ug/ml
Propionaldehyde-2	VB	13.46	48.9652	20.5938	2.37846	1	2.37846	ug/ml
Acrolein-2	BB	13.89	19.1592	8.25773	1.42649	1	1.42649	ug/ml

Chromatogram Report

Enthalpy Analytical

Sample Name	gcstds1919 #2
Sequence Name	LOLITA0458 ver.5
Inj Data File	030B0601.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 12:18 PM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Sample Type	Calibration
Vial Number	Vial 30
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



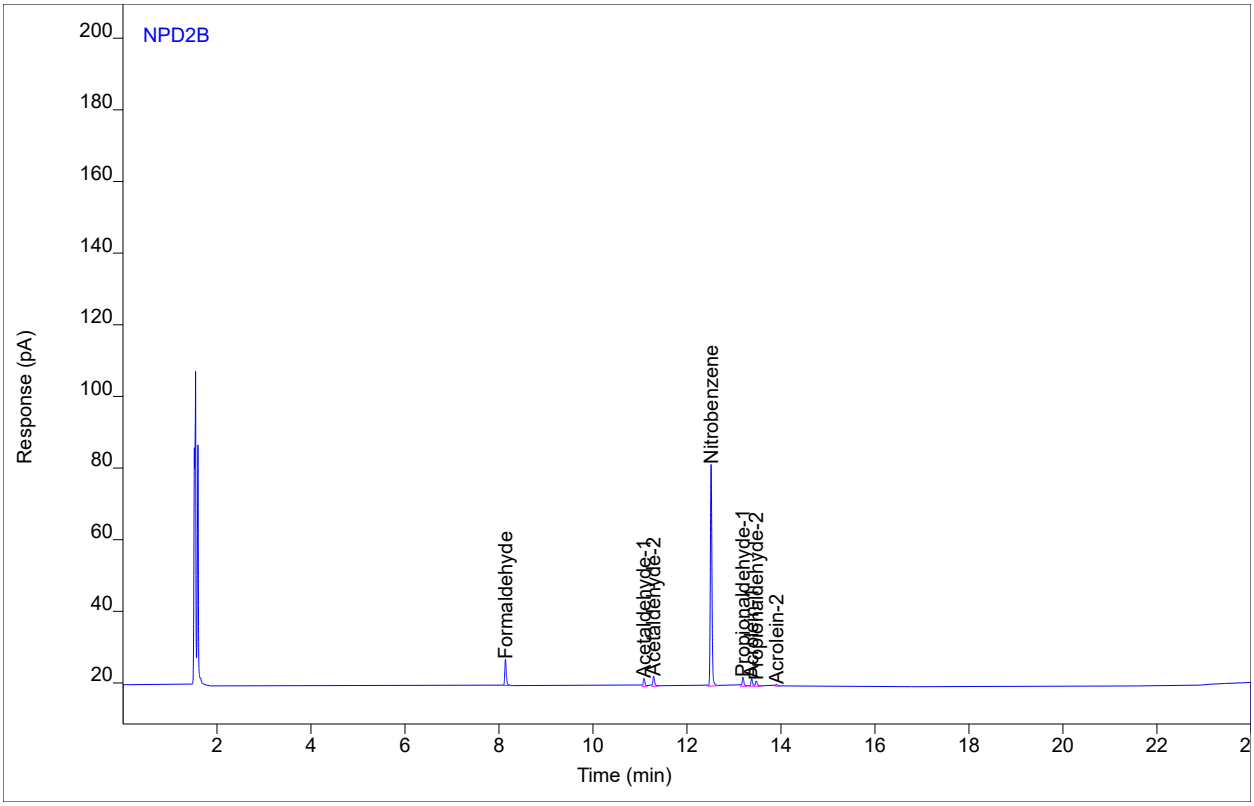
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				2.42658	1	2.42658	
Acrolein	Group				2.51419	1	2.51419	
Propionaldehyde	Group				2.40823	1	2.40823	
Formaldehyde	VV	8.13	83.1432	38.0845	2.42823	1	2.42823	ug/ml
Acetaldehyde-1	BB	11.07	27.9911	11.9303	1.07905	1	1.07905	ug/ml
Acetaldehyde-2	VV	11.27	34.9556	14.5657	1.34753	1	1.34753	ug/ml
Nitrobenzene	VB	12.51	143.582	61.3882	100.000	1	100.000	ug/ml
Propionaldehyde-1	BB	13.18	30.0795	13.4257	1.46645	1	1.46645	ug/ml
Acrolein-1	BV	13.37	25.5723	11.3739	1.91094	1	1.91094	ug/ml
Propionaldehyde-2	VB	13.46	19.3177	8.10659	0.94178	1	0.94178	ug/ml
Acrolein-2	BB	13.89	8.07276	3.27842	0.60325	1	0.60325	ug/ml

Chromatogram Report

Sample Name	gcstds1919 #1
Sequence Name	LOLITA0458 ver.5
Inj Data File	031B0701.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 12:47 PM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Calibration
Vial Number	Vial 31
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



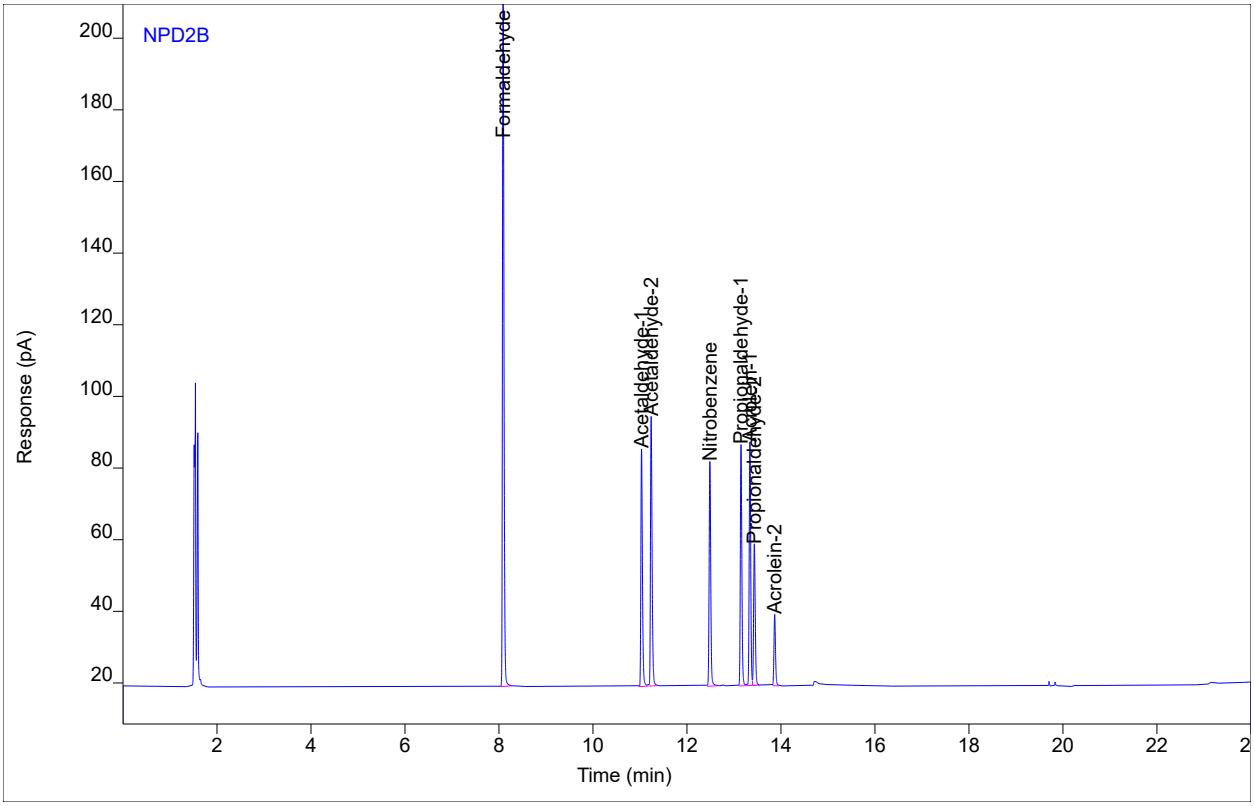
Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				0.49449	1	0.49449	
Acrolein	Group				0.48650	1	0.48650	
Propionaldehyde	Group				0.49875	1	0.49875	
Formaldehyde	VB	8.14	16.3632	7.37617	0.47352	1	0.47352	ug/ml
Acetaldehyde-1	VV	11.09	5.61247	2.30031	0.21438	1	0.21438	ug/ml
Acetaldehyde-2	VV	11.29	7.33343	2.92859	0.28011	1	0.28011	ug/ml
Nitrobenzene	VB	12.51	144.909	62.0119	100.000	1	100.000	ug/ml
Propionaldehyde-1	VB	13.19	6.02810	2.53665	0.29119	1	0.29119	ug/ml
Acrolein-1	BV	13.38	5.12206	2.19135	0.37925	1	0.37925	ug/ml
Propionaldehyde-2	VB	13.48	4.29678	1.65644	0.20756	1	0.20756	ug/ml
Acrolein-2	BB	13.91	1.44849	0.60144	0.10725	1	0.10725	ug/ml

Chromatogram Report

Sample Name	gcstds1949 #3ss
Sequence Name	LOLITA0458 ver.5
Inj Data File	032B0801.D
File Location	GC/2023/Lolita/Quarter 2
Injection Date	6/22/2023 2:12 PM
File Modified	6/26/2023 2:04 PM
Instrument	Lolita
Operator	Daniel Clayton

Enthalpy Analytical

Sample Type	Control
Vial Number	Vial 32
Injection Volume	1
Injection	1 of 1
Acquisition Method	LOLITA0349X.M
Analysis Method	LOLITA0458_NPD.M
Method Modified	6/26/2023 12:20 PM
Printed	6/26/2023 3:49 PM



Compound	Type	RT	Area	Height	Amount	DF	SampAmt	Unit
Acetaldehyde	Group				12.2762	1	12.2762	
Acrolein	Group				14.2343	1	14.2343	
Propionaldehyde	Group				11.6063	1	11.6063	
Formaldehyde	VB	8.09	436.333	200.067	12.3338	1	12.3338	ug/ml
Acetaldehyde-1	VV	11.03	152.029	66.4511	5.67234	1	5.67234	ug/ml
Acetaldehyde-2	VV	11.24	176.995	75.4092	6.60386	1	6.60386	ug/ml
Nitrobenzene	BV	12.49	148.349	62.8746	100.000	1	100.000	ug/ml
Propionaldehyde-1	BV	13.15	151.982	67.4759	7.17138	1	7.17138	ug/ml
Acrolein-1	VV	13.34	151.234	68.0700	10.9381	1	10.9381	ug/ml
Propionaldehyde-2	VB	13.43	93.9878	39.5166	4.43487	1	4.43487	ug/ml
Acrolein-2	BV	13.87	45.5746	20.0123	3.29620	1	3.29620	ug/ml

This Is The Last Page Of This Report.

APPENDIX F

CALIBRATION DATA

Advanced Industrial Resources, Inc.

Dry Gas Meter Calibration Data

Dry Gas Meter	
Console ID:	C-004
Serial Number:	229883

Reference Meter	
Meter ID:	M5RFM1
Calibration Factor, Y_w:	0.995

Date: 08/03/22 **Performed By:** DJK

Barometric Pressure, P_b (in. Hg): 29.88 **Reviewed By:** DPS

Data

Vacuum (in. Hg)	ΔH (in. H_2O)	Reference Meter Volume V_w (ft^3)	Dry Gas Meter Volume V_m (ft^3)	Temperatures (°F)				Time Elapsed θ (min.)
				Reference Meter t_w	Dry Gas Meter			
					init. t_i	final t_f	avg. t_m	
7.5	0.50	5.393	5.255	77	82.0	87.0	84.5	12.50
7.5	1.00	6.562	6.472	77	87.0	92.0	89.5	11.00
7.5	2.00	5.655	5.678	77	91.0	94.0	92.5	7.00
7.5	3.00	5.941	5.956	77	92.0	97.0	94.5	6.00
7.5	4.00	5.632	5.634	77	95.0	99.0	97.0	5.00

Calculations

ΔH (inches H_2O)	Y_m (dimensionless)	Variation		$ΔH_@$ (inches H_2O)	Variation (dimensionless)	
0.50	1.034	0.011		1.524	-0.130	
1.00	1.030	0.006		1.580	-0.074	
2.00	1.015	-0.009		1.714	0.059	
3.00	1.017	-0.006		1.705	0.051	
4.00	1.022	-0.002		1.749	0.094	
Averages:	**1.023**			**1.655**		

Where:

Y_m is the ratio of the reading of the reference meter to that of the dry gas meter (DGM); variance limit: ±0.02.

$$Y_m = \frac{Y_w V_w P_b (t_m + 460)}{V_m (P_b + \Delta H/13.6) (t_w + 460)}$$

$\Delta H_@$ is the orifice pressure differential (inches H_2O) that corresponds to 0.75 cfm of air at 68 °F and 29.92 inches of mercury; variance limit: ±0.20.

$$\Delta H_@ = \frac{0.0317 \Delta H ((t_w + 460) \theta)^2}{P_b (t_m + 460) (Y_w V_w)^2}$$

EMC Approved Alternative Method (EMC ALT-009)
Alternative Method 5 Post-test Calibration

Console ID: C-004
DGM Y_m: 1.023
$\Delta H_@$ 1.655 orifice meter calibration coefficient, in. H2O.
Source: Carbon Bed Outlet
Methods: 1, 2, 3, 4, 25A, NACSI 105.01

Run #	1	2	3	
Test Date	7/12/23	7/12/23	7/12/23	
Test time	144	134	143	total run time, min.
Vm	106.298	96.244	103.832	total sample volume measured by dry gas meter, dcf.
Tm	532	535	535	absolute average dry gas meter temp., BR.
Pb	30.12	30.12	30.12	barometric pressure, in. Hg.
ΔH_{avg}	1.71	1.71	1.71	average orifice meter differential, in. H20.
$M_{d\text{-stack gas}}$	28.84	28.84	28.84	dry molecular weight of stack gas, lb/lb-mole.
Y_{qa}	1.036	1.067	1.052	dry gas meter calibration check value, dimensionless.
K	0.0319	0.0319	0.0319	(29.92/528)(0.75)2 (in. Hg/B/R) cfm2.
$M_{d\text{-air}}$	29	29	29	dry molecular weight of air, lb/lb-mole.
Hg_{SG}	13.6	13.6	13.6	specific gravity of mercury.
% diff. from Y_m	-1.2%	-4.3%	-2.9%	

Average % diff. from Y_m: -2.8%
Calibration check value status: PASS

*Post-test DGM calibration check value (Y_{qa}) must be within ±5% of the specific DGM's established Y_m

Advanced Industrial Resources, Inc.

Dry Gas Meter Calibration Data

Dry Gas Meter	
Console ID:	C-009
Serial Number:	28507

Reference Meter	
Meter ID:	M5RFM1
Calibration Factor, Y_w:	0.995

Date: 08/03/22 **Performed By:** DJK

Barometric Pressure, P_b (in. Hg): 29.88 **Reviewed By:** DPS

Data

Vacuum (in. Hg)	ΔH (in. H_2O)	Reference Meter Volume V_w (ft^3)	Dry Gas Meter Volume V_m (ft^3)	Temperatures (°F)				Time Elapsed θ (min.)
				Reference Meter t_w	Dry Gas Meter			
					init. t_i	final t_f	avg. t_m	
7.5	0.50	5.294	5.267	77	77.0	78.0	77.5	12.50
7.5	1.00	5.442	5.358	77	78.0	78.0	78.0	9.00
7.5	2.00	5.554	5.431	77	77.0	78.0	77.5	6.50
7.5	3.00	5.874	5.682	77	77.0	78.0	77.5	5.50
7.5	4.00	6.172	5.963	77	77.0	78.0	77.5	5.00

Calculations

ΔH (inches H_2O)	Y_m (dimensionless)	Variation		$ΔH_@$ (inches H_2O)	Variation (dimensionless)	
0.50	1.000	-0.013		1.603	0.049	
1.00	1.010	-0.003		1.571	0.017	
2.00	1.013	0.000		1.575	0.021	
3.00	1.022	0.009		1.512	-0.042	
4.00	1.021	0.008		1.509	-0.045	
Averages:	**1.013**			**1.554**		

Where:

Y_m is the ratio of the reading of the reference meter to that of the dry gas meter (DGM); variance limit: ±0.02.

$$Y_m = \frac{Y_w V_w P_b (t_m + 460)}{V_m (P_b + \Delta H/13.6) (t_w + 460)}$$

$\Delta H_@$ is the orifice pressure differential (inches H_2O) that corresponds to 0.75 cfm of air at 68 °F and 29.92 inches of mercury; variance limit: ±0.20.

$$\Delta H_@ = \frac{0.0317 \Delta H ((t_w + 460)\theta)^2}{P_b (t_m + 460) (Y_w V_w)^2}$$

EMC Approved Alternative Method (EMC ALT-009)
Alternative Method 5 Post-test Calibration

Console ID: C-009
DGM Y_m: 1.013
$\Delta H_@$ 1.554 orifice meter calibration coefficient, in. H2O.
Source: Carbon Bed Outlet
Method: 1, 2, 3, 4, 25A, NACSI 105.01

Run #	1	2	3	
Test Date	7/12/23	7/12/23	7/12/23	
Test time	144	134	144	total run time, min.
Vm	108.425	98.778	106.568	total sample volume measured by dry gas meter, dcf.
Tm	525	533	535	absolute average dry gas meter temp., BR.
Pb	30.12	30.12	30.12	barometric pressure, in. Hg.
ΔH_{avg}	1.56	1.56	1.55	average orifice meter differential, in. H20.
$M_{d\text{-stack gas}}$	28.84	28.84	28.84	dry molecular weight of stack gas, lb/lb-mole.
Y_{qa}	0.993	1.021	1.018	dry gas meter calibration check value, dimensionless.
K	0.0319	0.0319	0.0319	(29.92/528)(0.75)2 (in. Hg/B/R) cfm2.
$M_{d\text{-air}}$	29	29	29	dry molecular weight of air, lb/lb-mole.
Hg_{SG}	13.6	13.6	13.6	specific gravity of mercury.
% diff. from Y_m	1.9%	-0.8%	-0.5%	

Average % diff. from Y_m: 0.2%
Calibration check value status: PASS

*Post-test DGM calibration check value (Y_{qa}) must be within ±5% of the specific DGM's established Y_m

15 POINT SECONDARY REFERENCE METER CALIBRATION

Date: July 14, 2022 **DGM Model:** S-110
Customer: Advance Industrial Resource **DGM S/N:** 356333

Reference Prover: #3050 **Tape:** #01131693

Pbar: 29.68 in Hg

Flow Rate (cfm) Q	Volume		Temperature		Pressure		Time (min) Θ	Meter Coefficient Y_{ds}	Average Meter Coefficient Y_{ds}
	Prover (ft³) V_w	DGM (ft³) V_{ds}	Prover (°F) t_w	DGM (°F) t_{ds}	Prover (in H_2O) P_w	DGM (in H_2O) P_m			
1.12	5.009	5.030	72.9	72.7	1.12	0.93	4.40	0.996	
1.12	5.009	5.035	72.9	72.8	1.12	0.93	4.40	0.995	
1.12	5.009	5.037	72.9	72.9	1.12	0.93	4.40	0.995	0.995
0.89	5.009	5.032	72.9	72.8	1.12	0.98	5.50	0.996	
0.89	5.009	5.030	72.9	72.9	1.12	0.98	5.50	0.996	
0.89	5.009	5.040	73.0	72.9	1.12	0.98	5.50	0.994	0.995
0.72	5.009	5.036	73.1	73.1	1.12	1.02	6.87	0.995	
0.72	5.009	5.038	72.9	72.9	1.12	1.02	6.87	0.994	
0.72	5.009	5.040	72.9	73.0	1.12	1.02	6.87	0.994	0.995
0.57	5.009	5.035	72.9	72.9	1.12	1.06	8.63	0.995	
0.57	5.009	5.034	72.8	72.8	1.12	1.06	8.63	0.995	
0.57	5.009	5.035	72.8	72.9	1.12	1.06	8.63	0.995	0.995
0.31	5.009	5.029	72.8	72.9	1.12	1.09	15.82	0.996	
0.31	5.009	5.032	72.8	72.8	1.12	1.09	15.82	0.996	
0.31	5.009	5.026	72.9	72.9	1.12	1.09	15.82	0.997	0.996

AVERAGE Y_{ds} **0.995**

$$Yds = \frac{Vw(tds + tstd)}{Vds(tw + tstd)} * \frac{Pbar}{\left(Pbar + Pm/13.6\right)}$$

$$Q = 17.64 \frac{Pbar}{(tw + tstd)} \frac{Vw}{\Phi}$$

Dry gas meter Serial Number 356333 was calibrated in accordance with the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 5 Section 16.1.1

Signature

Reference Meter Calibration

Environmental Supply Company, Inc.

Calibration Date: July 14, 2022

	Test Meter	Reference Meter
Model Number:	AP25	Shinagawa W-NK-1A
Serial Number:	1902110	538789
Y_i:		1.000

Flow Rate (lpm)	Test Meter Volume Initial (liters)	Test Meter Volume Final (liters)	Test Meter Volume (liters)	Test Meter Volume (std liters)	Test Meter DGM Temperatures Initial (°F)	Final (°F)	AVG (°F)	Reference Meter Volume Initial (liters)	Reference Meter Volume Final (liters)	Reference Meter Volume Total (liters)	Reference Meter Temp (°F)	Reference Meter Bar Pressure (in Hg)	Y_i	Y_i Avg	Y_i deviation
3.00	13,286.2	13,298.6	12.4	12.2	72.4	72.4	72.4	666.163	678.364	12.201	72.8	29.77	0.983	0.986	0.3
	13,298.6	13,310.8	12.2	12.0	72.6	72.4	72.5	678.364	690.565	12.201	72.8	29.77	1.000		-1.3
	13,310.8	13,323.3	12.5	12.3	72.4	72.4	72.4	690.565	702.776	12.211	72.7	29.77	0.976		1.0
1.50	13,324.7	13,338.0	13.3	13.1	72.6	72.6	72.6	704.321	717.518	13.197	72.8	29.77	0.992	0.988	-0.4
	13,338.0	13,350.7	12.7	12.5	72.6	72.6	72.6	717.518	729.910	12.392	72.9	29.77	0.975		1.3
	13,350.7	13,363.0	12.3	12.1	72.6	72.6	72.6	729.910	742.182	12.272	72.8	29.77	0.997		-0.9
0.80	13,363.4	13,370.1	6.7	6.6	72.8	72.6	72.7	742.556	749.155	6.599	72.9	29.77	0.985	0.988	0.3
	13,370.1	13,376.6	6.5	6.4	72.7	72.7	72.7	749.155	755.737	6.582	73.0	29.77	1.012		-2.4
	13,376.6	13,383.4	6.8	6.7	72.6	72.6	72.6	755.737	762.318	6.581	72.9	29.77	0.967		2.1
0.40	13,383.5	13,389.4	5.9	5.8	72.9	72.9	72.9	762.432	768.360	5.928	73.1	29.77	1.004	1.000	-0.4
	13,389.4	13,395.3	5.9	5.8	73.1	72.9	73.0	768.360	774.297	5.937	73.3	29.74	1.006		-0.5
	13,395.3	13,401.3	6.0	5.9	72.9	72.7	72.8	774.297	780.245	5.948	73.2	29.77	0.991		1.0
0.25	13,401.4	13,407.4	6.0	5.9	72.8	72.7	72.8	780.319	786.195	5.876	73.0	29.74	0.979	0.996	1.8
	13,407.4	13,413.3	5.9	5.8	72.8	72.6	72.7	786.195	792.079	5.884	73.0	29.74	0.997		0.0
	13,413.3	13,419.1	5.8	5.7	72.6	72.8	72.7	792.079	797.961	5.882	73.0	29.74	1.014		-1.7

Y_i Avg	0.992

signature

07/15/22
date

Advanced Industrial Resources, Inc.

Thermocouple Calibration Data

Thermometer ID: RT-01 ; RT-03 **Date:** 07/29/23

Bias: 0 **Performed By:** DK

Apparatus ID	Apparatus Description	Reference Temperature Reading		Indicated Temperature		Relative Variation
		°F	°R	°F	°R	%
P8-01	Stack Temp.	32	492	33	493	0.2
P8-01	Stack Temp.	210	670	211	671	0.1
B-01	Filter Temp.	32	492	32	492	0.0
B-01	Filter Temp.	210	670	210	670	0.0
B-01	Exit Imp. Temp.	32	492	32	492	0.0
B-01	Exit Imp. Temp.	210	670	211	671	0.1
C-009	Meter In Temp.	32	492	33	493	0.2
C-009	Meter In Temp.	210	670	210	670	0.0
C-009	Meter Out Temp.	32	492	32	492	0.0
C-009	Meter Out Temp.	210	670	211	671	0.1
B-01	Filter Exit Temp.	32	492	33	493	0.2
B-01	Filter Exit Temp.	210	670	210	670	0.0
P8-01	Probe Temp.	32	492	33	493	0.2
P8-01	Probe Temp.	210	670	211	671	0.1

Thermocouple Calibration Procedure

A. References

1. Mercury-in-glass refernce thermometer, calibrated against thermometric fixed points.
2. Thermometric fixed points, including ice bath and boiling water (corrected for barometric pressure)

B. Measurement

1. Compare field temperature sensors against the reference thermometer. Agreement must be within ±1.5% of the absolute reference temperature.

Advanced Industrial Resources, Inc.

Thermocouple Calibration Data

Thermometer ID: RT-01 ; RT-03 **Date:** 07/29/23

Bias: 0 **Performed By:** DK

Apparatus ID	Apparatus Description	Reference Temperature Reading		Indicated Temperature		Relative Variation
		°F	°R	°F	°R	%
P8-02	Stack Temp.	32	492	32	492	0.0
P8-02	Stack Temp.	210	670	212	672	0.3
B-02	Filter Temp.	32	492	32	492	0.0
B-02	Filter Temp.	210	670	210	670	0.0
B-02	Exit Imp. Temp.	32	492	33	493	0.2
B-02	Exit Imp. Temp.	210	670	212	672	0.3
C-004	Meter In Temp.	32	492	33	493	0.2
C-004	Meter In Temp.	210	670	210	670	0.0
C-004	Meter Out Temp.	32	492	33	493	0.2
C-004	Meter Out Temp.	210	670	210	670	0.0
B-02	Filter Exit Temp.	32	492	33	493	0.2
B-02	Filter Exit Temp.	210	670	210	670	0.0
P8-02	Probe Temp.	32	492	33	493	0.2
P8-02	Probe Temp.	210	670	211	671	0.1

Thermocouple Calibration Procedure

A. References

1. Mercury-in-glass refernce thermometer, calibrated against thermometric fixed points.
2. Thermometric fixed points, including ice bath and boiling water (corrected for barometric pressure)

B. Measurement

1. Compare field temperature sensors against the reference thermometer. Agreement must be within ±1.5% of the absolute reference temperature.

Advanced Industrial Resources, Inc.
Type-S Pitot Tube Assembly Inspection Data Sheet

Date: 3/31/2023

Pitot Tube Assembly: OR-P8-01 Caliper ID: CL-OR

Performed by: DK

Pitot tube assembly level? x yes _____ no

Pitot tube openings damaged? _____ yes (explain below) x no

α_1= 2 ^{o}(<10^o) β_1= 0 ^{o}(<5^o)

α_2= 1 ^{o}(<10^o) β_2= 0 ^{o}(<5^o)

γ = 2 ^{o} θ = 0 ^{o} A= 0.9 in.

z = A sin γ = 0.0314 in. <1/8 in. (0.125 in.)

w = A sin θ = 0.0000 in. <1/32 in. (0.03125 in.)

P_A= 0.450 in. **P_B=** 0.450 in.

D_t = 0.375 in. **P / D_t =** 1.2 (1.05 </= and </= 1.50)

$P_a = P_b = P$

X = 1.20 (>0.75 in.) (Dist. between pitot and nozzle)

Y = 3.90 (>3.0 in.) (Dist. from nozzle union to pitot tube openings)

Z = 1.20 (>0.75 in.) (Dist. between pitot and stack thermocouple)

Does the pitot tube assembly meet the Method 2 requiremnets? x yes

_____ no (explain below)

If the Method 2 requirements are met then a coefficient of **0.84** is assigned to the pitot tube assembly being inspected.

Advanced Industrial Resources, Inc.
Type-S Pitot Tube Assembly Inspection Data Sheet

Date: 5/26/2023

Pitot Tube Assembly: OR-P8-02 Caliper ID: CL-OR

Performed by: DK

Pitot tube assembly level? x yes _____ no

Pitot tube openings damaged? _____ yes (explain below) x no

α_1= 0 ^{o}(<10^o) β_1= 0 ^{o}(<5^o)

α_2= 0 ^{o}(<10^o) β_2= 0 ^{o}(<5^o)

γ = 0 ^{o} θ = 0 ^{o} A= 0.9 in.

z = A sin γ = 0.0000 in. <1/8 in. (0.125 in.)

w = A sin θ = 0.0000 in. <1/32 in. (0.03125 in.)

P_A= 0.450 in. **P_B=** 0.450 in.

D_t = 0.375 in. **P / D_t =** 1.2 (1.05 </= and </= 1.50)

$P_a = P_b = P$

X = 1.00 (>0.75 in.) (Dist. between pitot and nozzle)

Y = 4.00 (>3.0 in.) (Dist. from nozzle union to pitot tube openings)

Z = 1.00 (>0.75 in.) (Dist. between pitot and stack thermocouple)

Does the pitot tube assembly meet the Method 2 requiremnets? x yes

_____ no (explain below)

If the Method 2 requirements are met then a coefficient of **0.84** is assigned to the pitot tube assembly being inspected.

Advanced Industrial Resources, Inc.

Analyzer Pretest Data Worksheet

Operator Name: Dan Kirk
Facility Name, Location: Juno Toledo OR
Source ID: Carbon Bed I/O
Date: 7/12/23

Analyte 1: O2 — **EPA Method:** 3A
Analyte 2: CO2 — **EPA Method:** 3A
Analyte 7: VOC — **EPA Method:** 25A

Calibration Gas Serial Numbers & Concentrations

Gas (Zero,		Analyzer I.D.	(% or ppm)	Cylinder ID #	Expiration Date	Manufacturer
Zero (N_2 or Air)		NA	0.00	N2		Airgas
O2	mid	12	10.96	CC714931	5/4/2029	
O2	high	12	20.00	EB0156143	8/8/2030	
CO2	mid	12	8.91	CC714931	5/4/2029	
CO2	high	12	17.92	EB0156143	8/8/2030	
VOC Out	low	CAE 211696	35.00	EB0158879	12/16/2030	
VOC Out	mid	CAE 211696	50.00	EB0158879	12/16/2030	
VOC Out	high	CAE 211696	95.00	EB0158879	12/16/2030	
VOC In	low	CAE 211697	35.00	EB0158879	12/16/2030	
VOC In	mid	CAE 211697	50.00	EB0158879	12/16/2030	
VOC In	high	CAE 211697	95.00	EB0158879	12/16/2030	

System Response Times

	Analyte 1	Analyte 2	Analyte 3	Analyte 4	Analyte 5
Analyte:	**O2**	**CO2**	**VOC Out**	**VOC In**	
	Minutes & Seconds				
Zero to 95% Response Time	00:22	00:25	00:18	00:18	
High to 5% Response Time	00:22	00:24	00:19	00:18	
Maximum Response Time	00:22	00:25	00:19	00:18	00:00
2 x Max. Response Time	00:44	00:50	00:38	00:36	00:00

	Analyte 6	Analyte 7	Analyte 8	
				Response & "2 x" Max Response Time to be used during testing
	Minutes & Seconds			
Zero to 95% Response Time				
High to 5% Response Time				
Maximum Response Time	00:00	00:00	00:00	00:25
2 x Max. Response Time	00:00	00:00	00:00	00:50

System Leak Checks:
Pre-Test: Solid at 7.5"Hg
Post-Test: Solid at 7.5"Hg

Advanced Industrial Resources, Inc.

Method 205 Prestest Data

Operator Name: Dan Kirk
Facility Name, Location: Juno Toledo OR

Source ID: **Carbon Bed I/O**
Date: **7/11/23**
Time **12:29**

Analyte 1: Oxygen O2

EPA Method: 3A

Calibration Gas Serial Numbers & Concentrations

(Zero, Low, Mid and High)	Analyzer I.D.	(% or ppm)	Cylinder ID #	Expiration Date	Manufacturer
Zero (N_2 or Air)	NA	0.00	N2		Airgas
O2 (Mid)	12	10.96	CC714931	5/4/2029	Airgas
O2 (High)	12	20.00	EB0156143	8/8/2030	Airgas

	Analyte/Gas	Concentration	CC No.
Upscale Cal Gas Info:	O2	20.00	EB0156143
Check Gas Informaiton:	O2	10.96	CC714931

	MFC 5000 ccm Evaluation					
	Dilution Conc.	**Cal Gas ccm**	**Dil Gas ccm**	**Cal Gas**	**Check Gas**	**Total Flow**
	10.0	3490.76	3509.24	20.00	10.96	**7000**
	5.0	1745.38	5254.62			
	Dilution Level No.1		**Dilution Level No.2**		**Check Gas**	
Low Tolerance	**9.774**		**4.887**		**10.741**	
Evaluation No.1	9.996	**PASS**	4.937	**PASS**	10.932	**PASS**
Evaluation No.2	9.979	**PASS**	5.017	**PASS**	10.958	**PASS**
Evaluation No.3	9.947	**PASS**	5.013	**PASS**	10.952	**PASS**
High Tolerance	**10.173**		**5.087**		**11.179**	
	Dil Level No.1 Avg		**Dil Level No.2 Avg**		**Check Gas Avg**	
	9.974		4.989		10.947	
Evaluation No.1 (% diff Mean)	0.22%	**PASS**	1.04%	**PASS**	0.14%	**PASS**
Evaluation No.2 (% diff Mean)	0.05%	**PASS**	0.56%	**PASS**	0.10%	**PASS**
Evaluation No.3 (% diff Mean)	0.27%	**PASS**	0.48%	**PASS**	0.04%	**PASS**

Raw Data

Time	Time	O2 %
7/11/23	12:29	0.009
7/11/23	12:30	0.002
7/11/23	12:31	0.078
7/11/23	12:32	10.31
7/11/23	12:33	20.00
7/11/23	12:34	19.93
7/11/23	12:35	15.83
7/11/23	12:36	10.956
7/11/23	12:37	10.914
7/11/23	12:38	10.057
7/11/23	12:39	9.929
7/11/23	12:40	9.996
7/11/23	12:41	7.365
7/11/23	12:42	4.943
7/11/23	12:43	4.937
7/11/23	12:44	8.445
7/11/23	12:45	10.996
7/11/23	12:46	10.932
7/11/23	12:47	10.540
7/11/23	12:48	9.987
7/11/23	12:49	9.979
7/11/23	12:50	7.039
7/11/23	12:51	4.951
7/11/23	12:52	5.017
7/11/23	12:53	7.842
7/11/23	12:54	10.913
7/11/23	12:55	10.958
7/11/23	12:56	10.368
7/11/23	12:57	9.950
7/11/23	12:58	9.947
7/11/23	12:59	7.177
7/11/23	13:00	5.003
7/11/23	13:01	5.013
7/11/23	13:02	7.813
7/11/23	13:03	11.005
7/11/23	13:04	10.952

Carbon Bed I/O
Calibration Error Test at Run 1

Operator:	Dan Kirk		
Date	7/11/2023		
Analyte	O2		O2
Units	%		
Zero Ref Cyl	0.0		
Zero Avg	0.078	Times	12:31
Zero Error%	0.4%		
Zero CALERR PASS?	PASS		
Mid Ref Cyl	10.96		
Mid Avg	10.91	Times	12:37
Mid Error%	-0.2%		
Mid CALERR PASS?	PASS		
High Ref Cyl	20.00		
High Avg	19.93	Times	12:34
High Error%	-0.3%		
High CALERR PASS?	PASS		

Airgas Specialty Gases
Airgas USA LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI80E15A0007	Reference Number:	122-402105348-1
Cylinder Number:	CC714931	Cylinder Volume:	150.4 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22021	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	May 04, 2021

Expiration Date: May 04, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	9.000 %	8.914 %	G1	+/- 0.8% NIST Traceable	05/04/2021
OXYGEN	11.00 %	10.96 %	G1	+/- 0.4% NIST Traceable	05/04/2021
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060638	CC414571	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 14, 2025
NTRM	10010616	K014963	9.967 % OXYGEN/NITROGEN	+/- 0.3%	Apr 19, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VA-5001 CO2 BF89GV17	Nondispersive Infrared (NDIR)	Apr 29, 2021
Siemens Oxymat 61 M3299 O2	Paramagnetic	Apr 28, 2021

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas Specialty Gases
Airgas USA LLC
525 North Industrial Loop Road
Tooele, UT 84074
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E03NI62E15A1071	Reference Number:	153-402506671-1
Cylinder Number:	EB0156143	Cylinder Volume:	141.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72022	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Aug 08, 2022

Expiration Date: Aug 08, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	18.00 %	17.92 %	G1	+/- 0.8% NIST Traceable	08/08/2022
OXYGEN	20.00 %	20.00 %	G1	+/- 0.5% NIST Traceable	08/08/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060802	CC415397	24.04 % CARBON DIOXIDE/NITROGEN	0.6%	Dec 11, 2025
NTRM	09061434	CC282492	22.53 % OXYGEN/NITROGEN	0.4%	May 13, 2025

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA-510 SV4MEUTJ CO2	CO2 NDIR (Dixon)	Jul 20, 2022
Horiba MPA-510 W603MM58 O2	O2 Paramagnetic (Mason)	Jul 20, 2022

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas Specialty Gases
Airgas USA LLC
525 North Industrial Loop Road
Tooele, UT 84074
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Part Number:	E02NI99E15A0932	Reference Number:	153-402614773-1
Cylinder Number:	EB0158879	Cylinder Volume:	144.0 CF
Laboratory:	124 - Tooele (SAP) - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72022	Valve Outlet:	350
Gas Code:	PPN,BALN	Certification Date:	Dec 16, 2022

Expiration Date: Dec 16, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results relate only to the items tested. The report shall not be reproduced except in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	500.0 PPM	501.8 PPM	G1	+/- 0.7% NIST Traceable	12/16/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12010923	ND46382	487 PPM PROPANE/AIR	0.6%	Apr 24, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 AUP2110269 C3H8 MC3H8	FTIR	Dec 14, 2022

Triad Data Available Upon Request

Signature on file
Approved for Release

coastalinstruments
MASS FLOW CONTROLLER SPECIALISTS
707 Enterprise Dr • Post Office Box 699 • Burgaw, North Carolina 28425 • (910) 259-4485
http://www.mfchelp.com

Certificate #:
NC00060727

Certificate Of Calibration

The following device has been calibrated in accordance with ANSI Z540-1-1994 and ISO/IEC-17025:2017 using instruments traceable to the National Institute of Standards and Technology

ADVANCED INDUSTRIAL RESOURCES
3407 Novis Pointe
Acworth GA 30101
USA

STP Conditions: 25.0 °C @ 760 mmHg
Calibration Temperature 22.2° C ± 3° C
He pre-ship leak rate 1 x 10- 9

Model: HASTINGS HFC-212
Serial Number: 0127751001
Range: 1000 sccm
Gas: AIR
Inlet Pressure: 30 PSIG
Outlet Pressure: ATM
Positioning: HBD
Calibration Gas: N2, N2 CF = 0.998
Calibration Date: 9/13/2021
Issue Date: 09/14/2021

As Found

Volt	%	Calc. Flow (sccm)	F.S. Dev.
		no data taken	

As Left

Volt	%	Calc. Flow (sccm)	F.S. Dev.
0.009	0	No Flow	0.18%
1.00	20	198.09	-0.19%
2.00	40	397.66	-0.23%
3.00	60	597.52	-0.25%
4.00	80	798.57	-0.14%
5.00	100	1002.2	0.22%

% F.S. Dev = (Calculated - Target) / Full Scale * 100

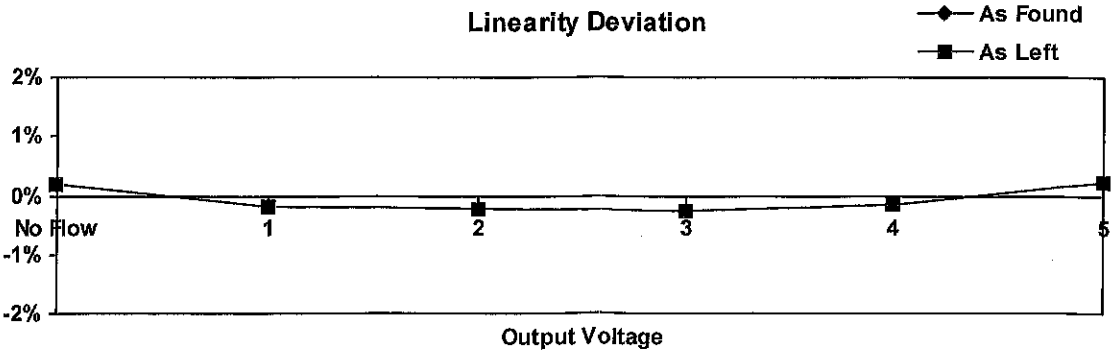
Initial Inspection
- No visible contamination

Services
- Purged sensor with methyl alcohol and N2
- Cleaned IAW Document 003 (rev 08/15/16), "Cleaning"
- Calibrated and response tested at full scale flow IAW Document 005 (rev 09/06/16), "MFC Calibration"
- Assembled with Viton seals

Parts Replaced
- No parts required

Comments
- We appreciate your business!
- 10% = 98.36 30% = 297.72
- 50% = 497.61 70% = 697.48
- 90% = 899.77
- The referenced DUT meets the Coastal Instruments internal quality specification for tolerance

Checked for accuracy by: Brad Darby, Quality



Calibration And Repair Of All Mass Flow Brands And Models

coastalinstruments
MASS FLOW CONTROLLER SPECIALISTS
707 Enterprise Dr • Post Office Box 699 • Burgaw, North Carolina 28425 • (910) 259-4485
http://www.mfchelp.com

Certificate #:
NC00060711

Certificate Of Calibration

The following device has been calibrated in accordance with ANSI Z540-1-1994 and ISO/IEC-17025:2017 using instruments traceable to the National Institute of Standards and Technology

ADVANCED INDUSTRIAL RESOURCES
3407 Novis Pointe
Acworth GA 30101
USA

STP Conditions: 25.0 °C @ 760 mmHg
Calibration Temperature Room Temperature
He pre-ship leak rate 0 x 10- 0

Model: HASTINGS HFC-212
Serial Number: 3161400002
Range: 5000 sccm
Gas: N2
Inlet Pressure: 30 PSIG
Outlet Pressure: ATM
Positioning: HBD
Calibration Gas: N2, N2 CF = 1
Calibration Date: 9/10/2021
Issue Date: 09/13/2021

As Found

Volt	%	Calc. Flow (sccm)	F.S. Dev.
		no data taken	

As Left

Volt	%	Calc. Flow (sccm)	F.S. Dev.
0.008	0	No Flow	0.16%
1.00	20	1014.0	0.28%
2.00	40	2023.6	0.47%
3.00	60	3020.8	0.42%
4.00	80	4006.8	0.14%
5.00	100	5000.8	0.02%

% F.S. Dev = (Calculated - Target) / Full Scale * 100

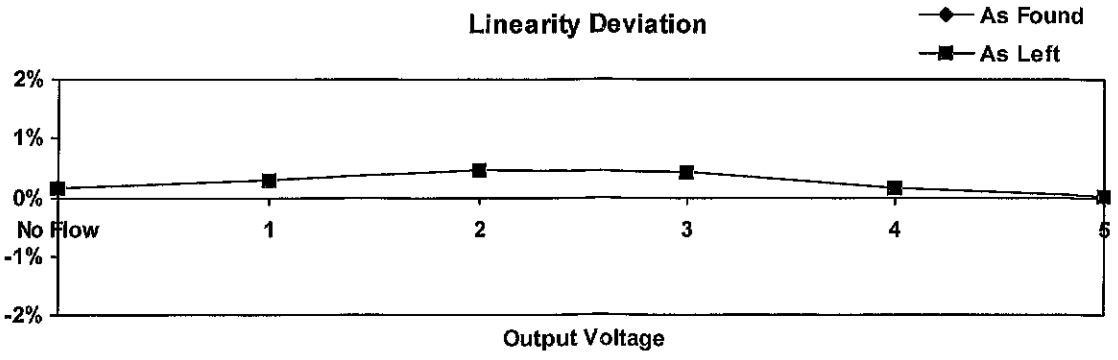
Initial Inspection
- No visible contamination

Services
- Purged sensor with methyl alcohol and N2
- Cleaned IAW Document 003 (rev 08/15/16), "Cleaning"
- Calibrated and response tested at full scale flow IAW Document 005 (rev 09/06/16), "MFC Calibration"

Parts Replaced
- No parts required

Comments
- We appreciate your business!
- 10% = 503.05 30% = 1522.1
- 50% = 2523.9 70% = 3514.2
- 90% = 4502.1
- The referenced DUT meets the Coastal Instruments internal quality specification for tolerance

Checked for accuracy by: Brad Darby, Quality



Calibration And Repair Of All Mass Flow Brands And Models

coastalinstruments
MASS FLOW CONTROLLER SPECIALISTS
707 Enterprise Dr • Post Office Box 699 • Burgaw, North Carolina 28425 • (910) 259-4485
http://www.mfchelp.com

Certificate #:
NC00060696

Certificate Of Calibration

The following device has been calibrated in accordance with ANSI Z540-1-1994 and ISO/IEC-17025:2017 using instruments traceable to the National Institute of Standards and Technology

ADVANCED INDUSTRIAL RESOURCES
3407 Novis Pointe
Acworth GA 30101
USA

STP Conditions: 25.0 °C @ 760 mmHg
Calibration Temperature 22.2° C ± 3° C
He pre-ship leak rate 1 x 10- 9

Model: HASTINGS HFC-212
Serial Number: 3053000003
Range: 10000 sccm
Gas: AIR
Inlet Pressure: 30 PSIG
Outlet Pressure: ATM
Positioning: HBD
Calibration Gas: N2, N2 CF = 0.998
Calibration Date: 9/9/2021
Issue Date: 09/10/2021

As Found

Volt	%	Calc. Flow (sccm)	F.S. Dev.
		no data taken	

As Left

Volt	%	Calc. Flow (sccm)	F.S. Dev.
0.009	0	No Flow	0.18%
1.00	20	1965.0	-0.35%
2.00	40	3942.3	-0.58%
3.00	60	5922.8	-0.77%
4.00	80	7955.6	-0.44%
5.00	100	10072	0.72%

% F.S. Dev = (Calculated - Target) / Full Scale * 100

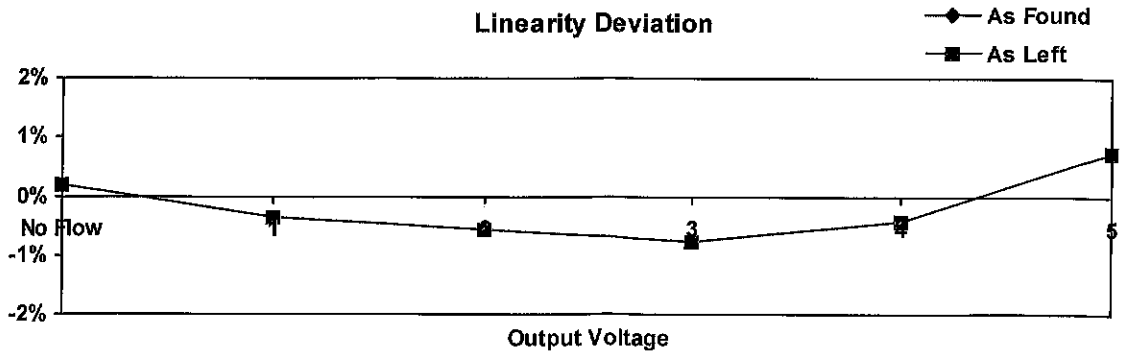
Initial Inspection
- No visible contamination

Services
- Purged sensor with methyl alcohol and N2
- Cleaned IAW Document 003 (rev 08/15/16), "Cleaning"
- Calibrated and response tested at full scale flow IAW Document 005 (rev 09/06/16), "MFC Calibration"
- Assembled with Viton seals

Parts Replaced
- No parts required

Comments
- We appreciate your business!
- 10% = 971.89 / 30% = 2950.3
- 50% = 4928.6 / 70% = 6934.9
- 90% = 9030.4
- The referenced DUT meets the Coastal Instruments internal quality specification for tolerance

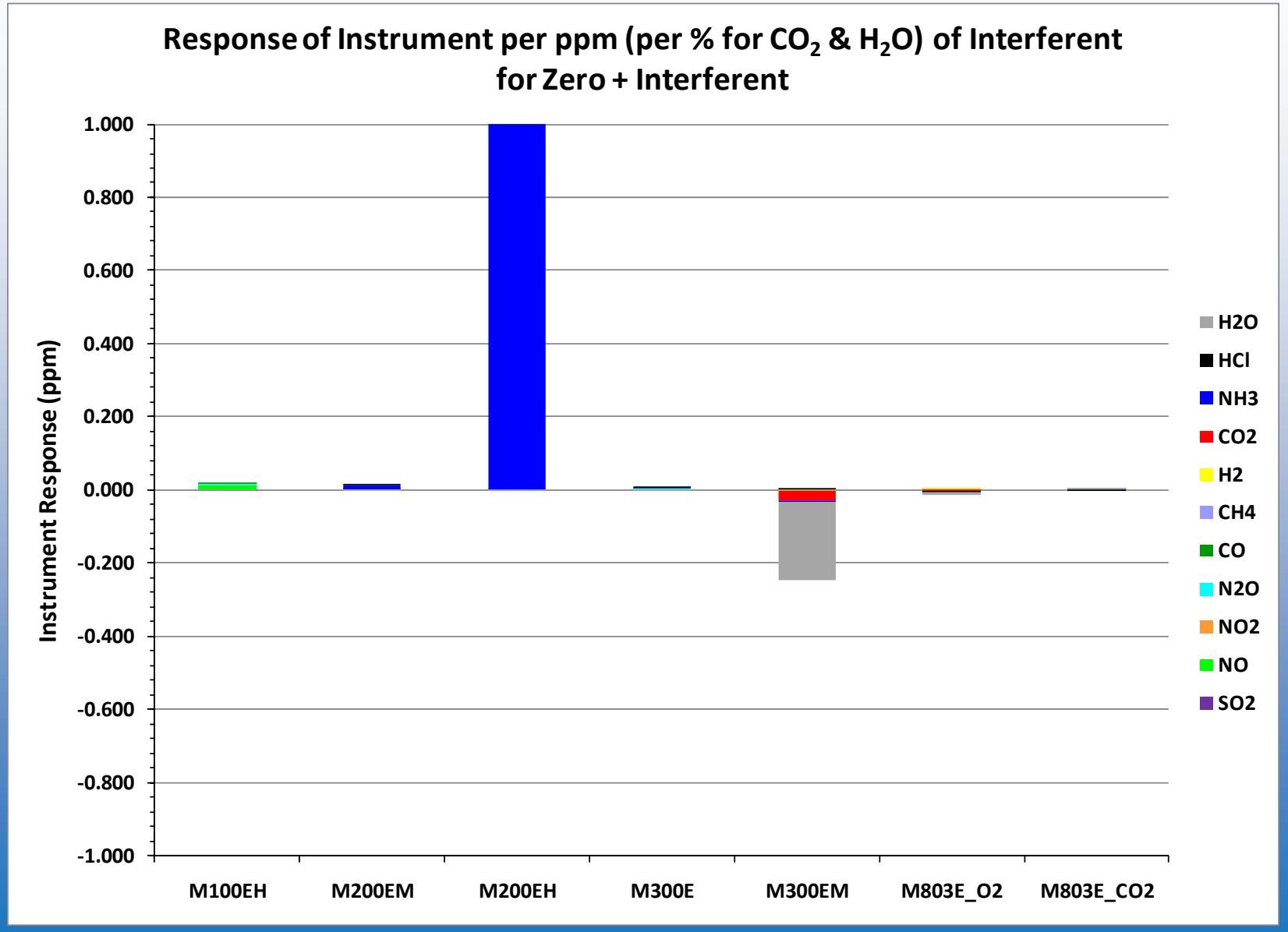
Checked for accuracy by: Brad Darby, Quality



Calibration And Repair Of All Mass Flow Brands And Models

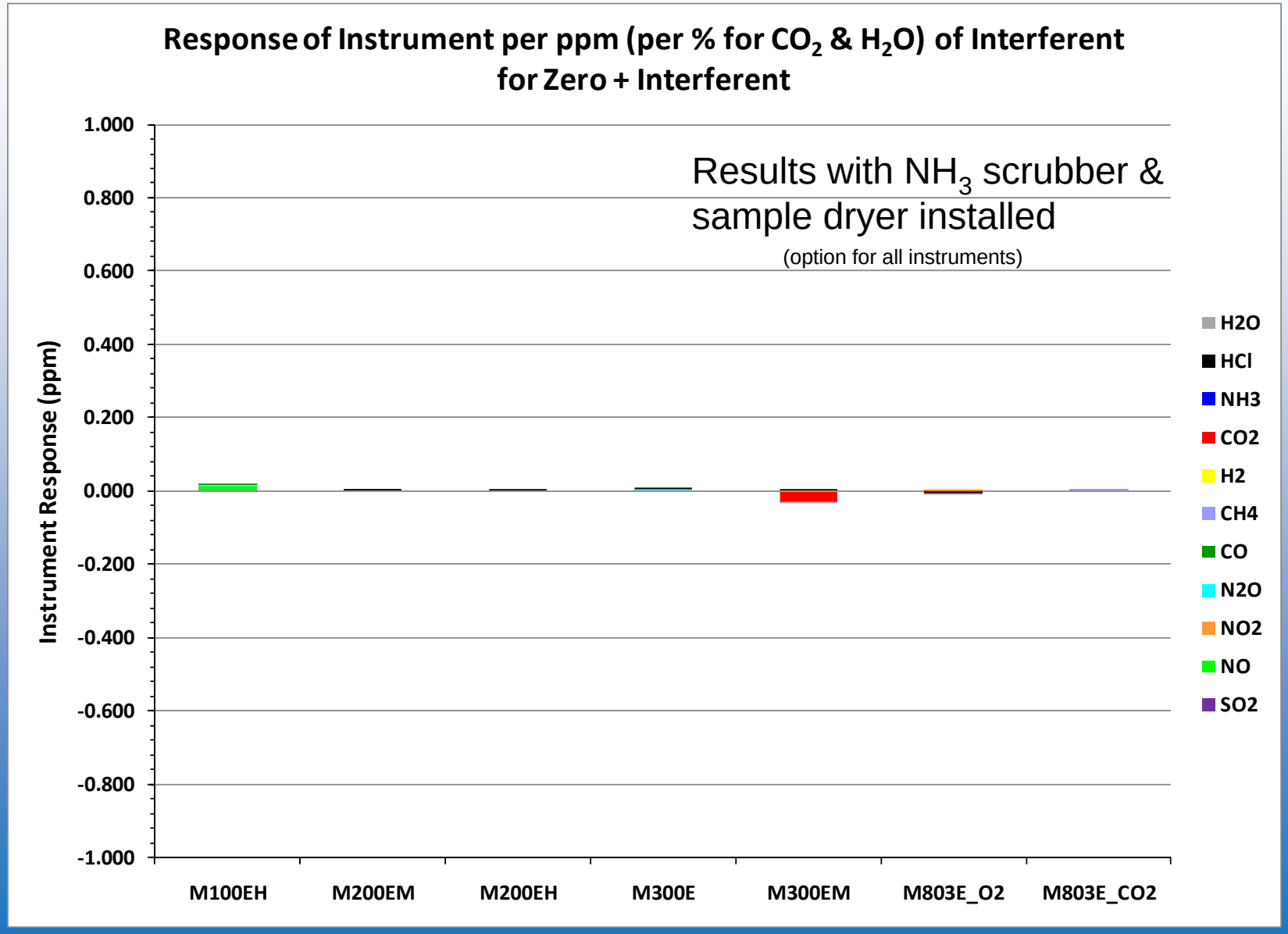
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Zero + Interferent: Instrument Response / ppm



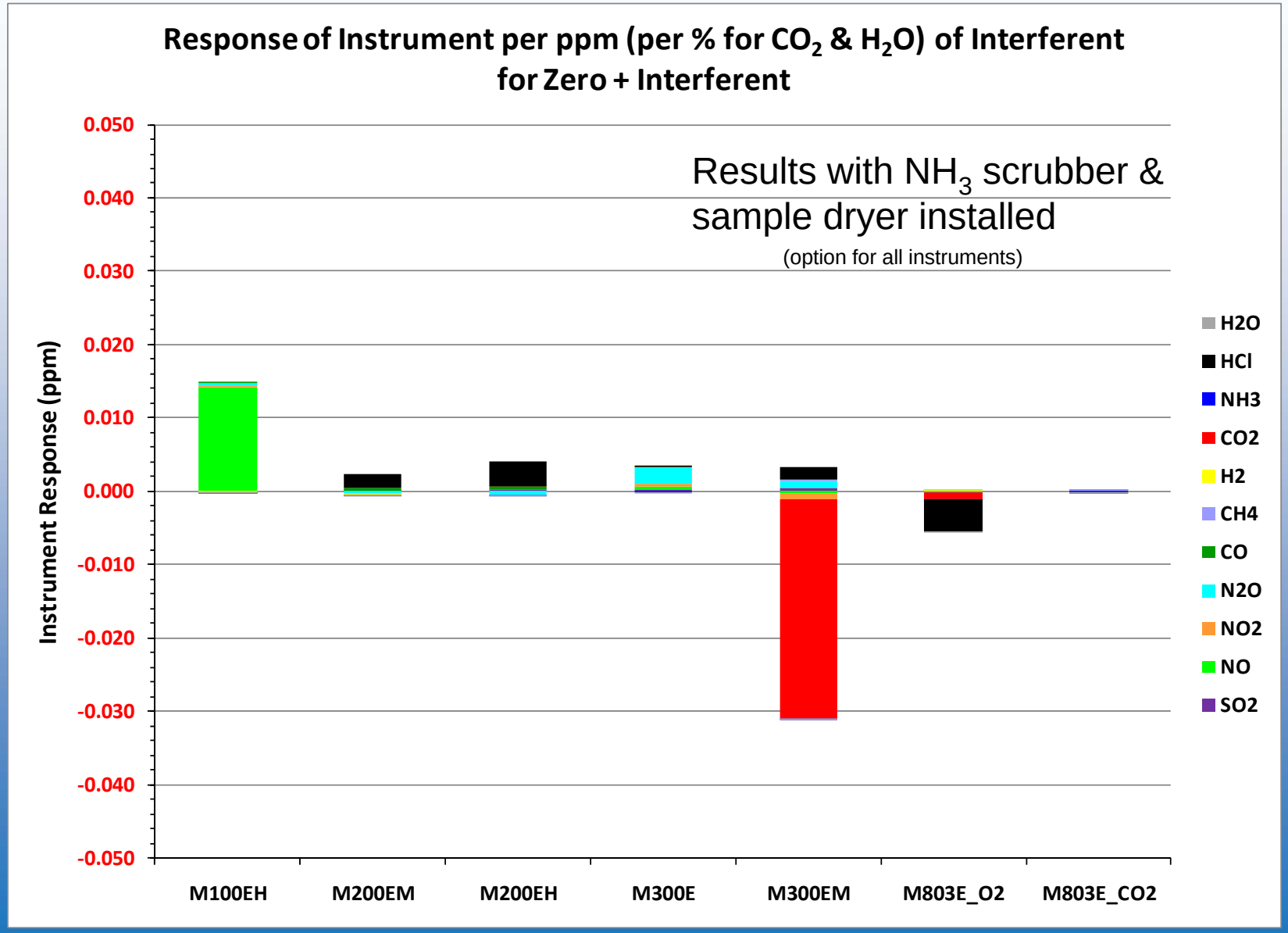
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Zero + Interferent: Instrument Response / ppm



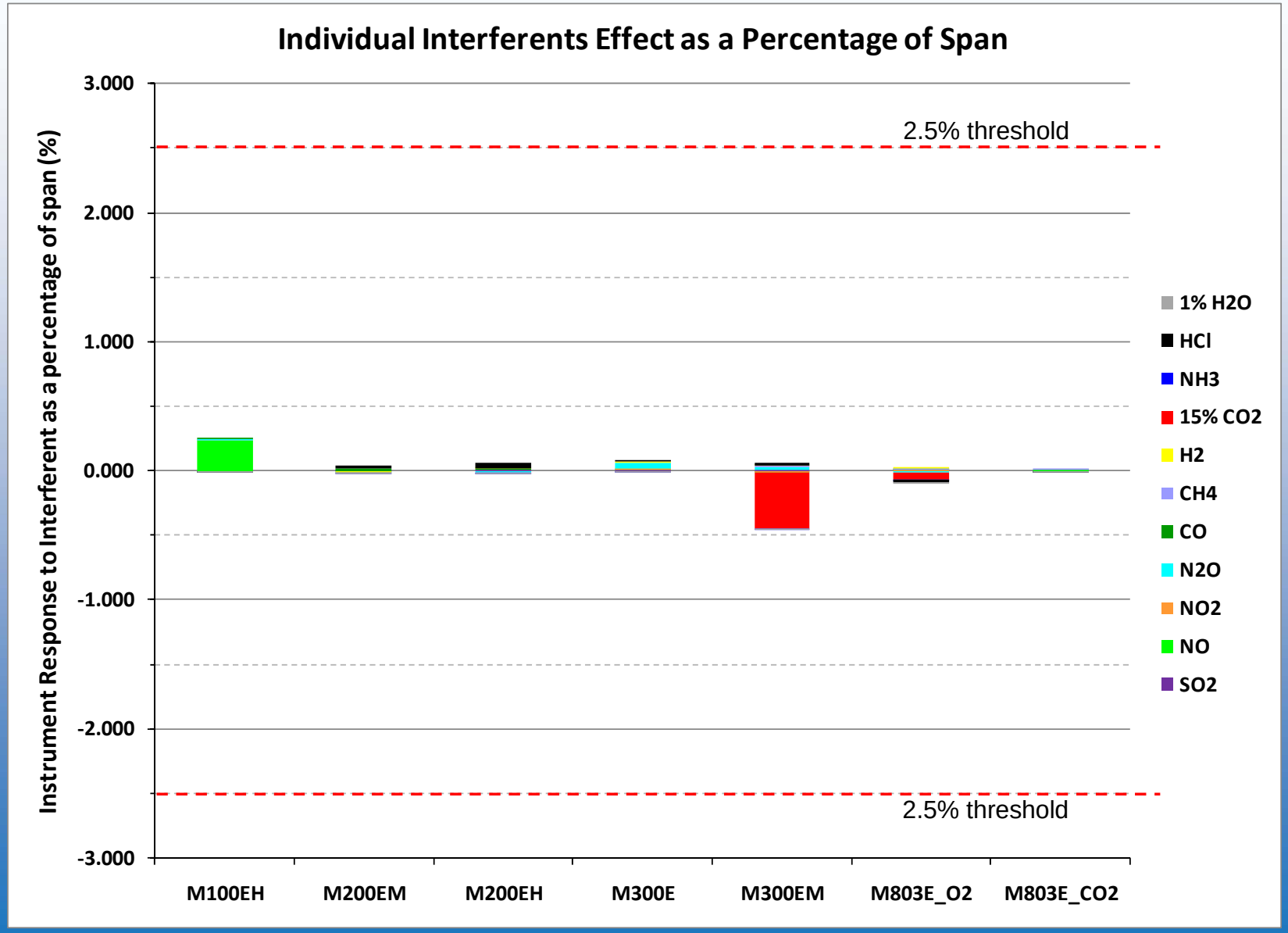
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Zero + Interferent: Instrument Response / ppm



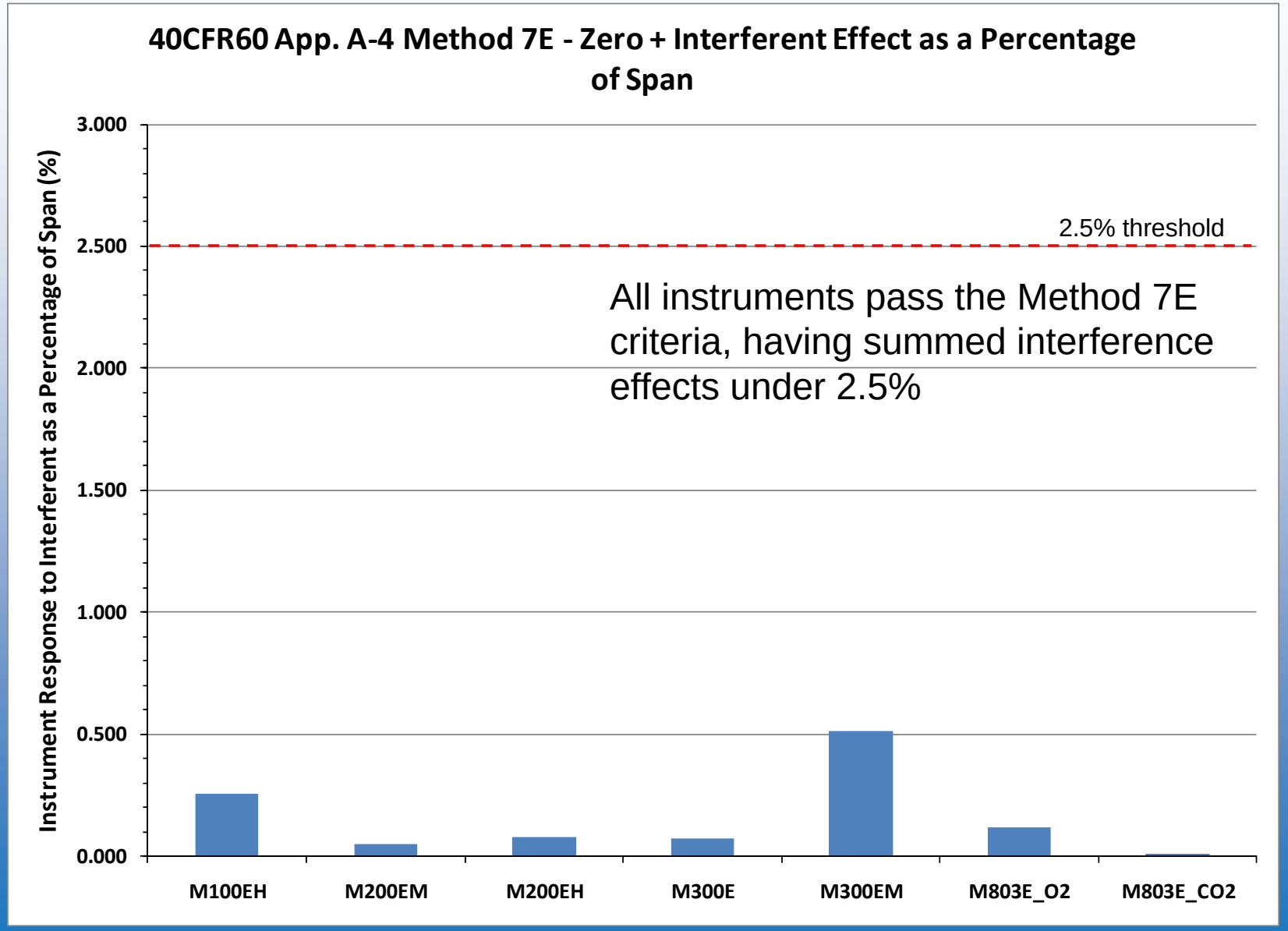
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Zero + Interferent: 40CFR60 App. 4-A Method 7E



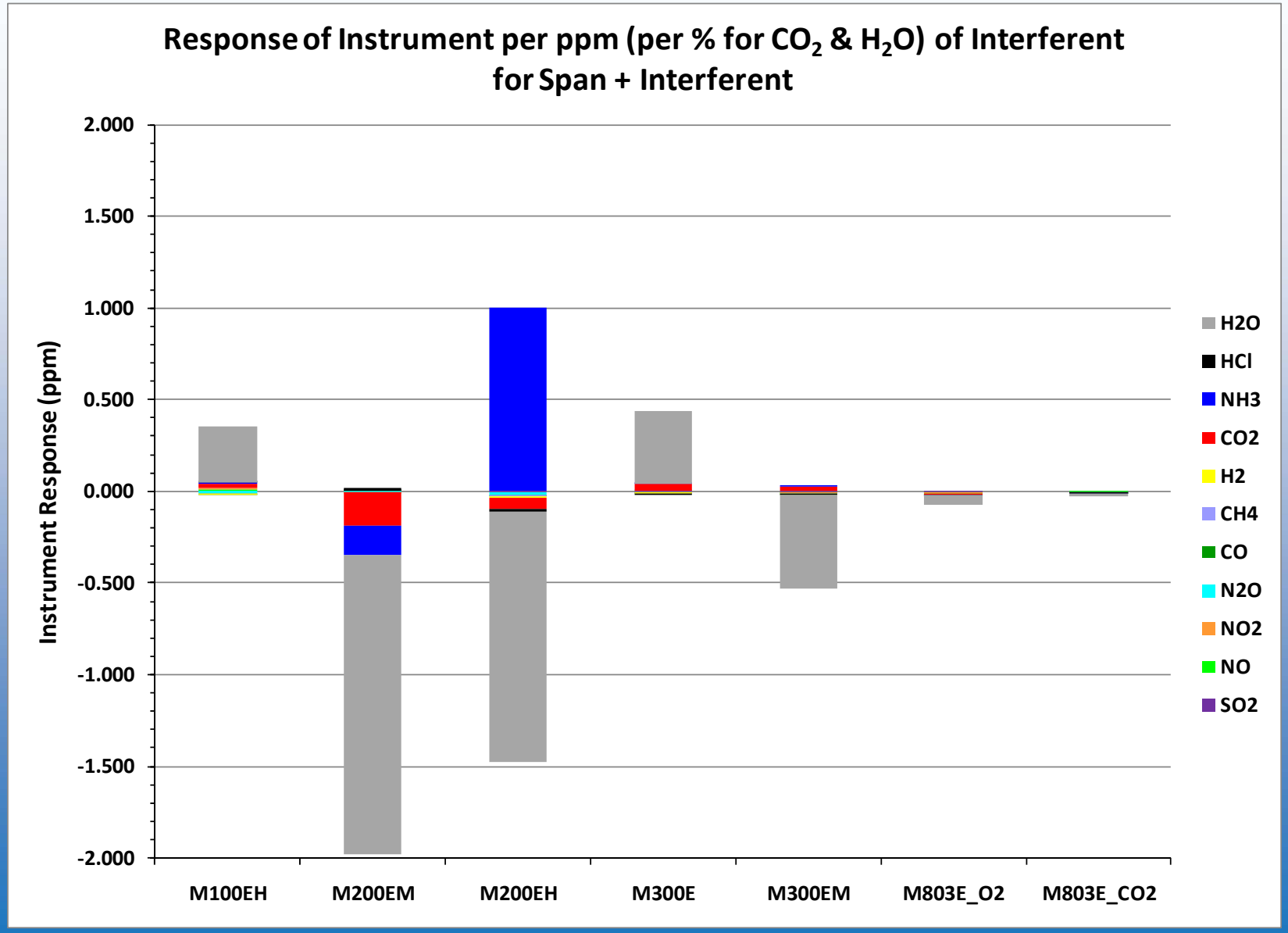
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Zero + Interferent: 40CFR60 App. 4-A Method 7E



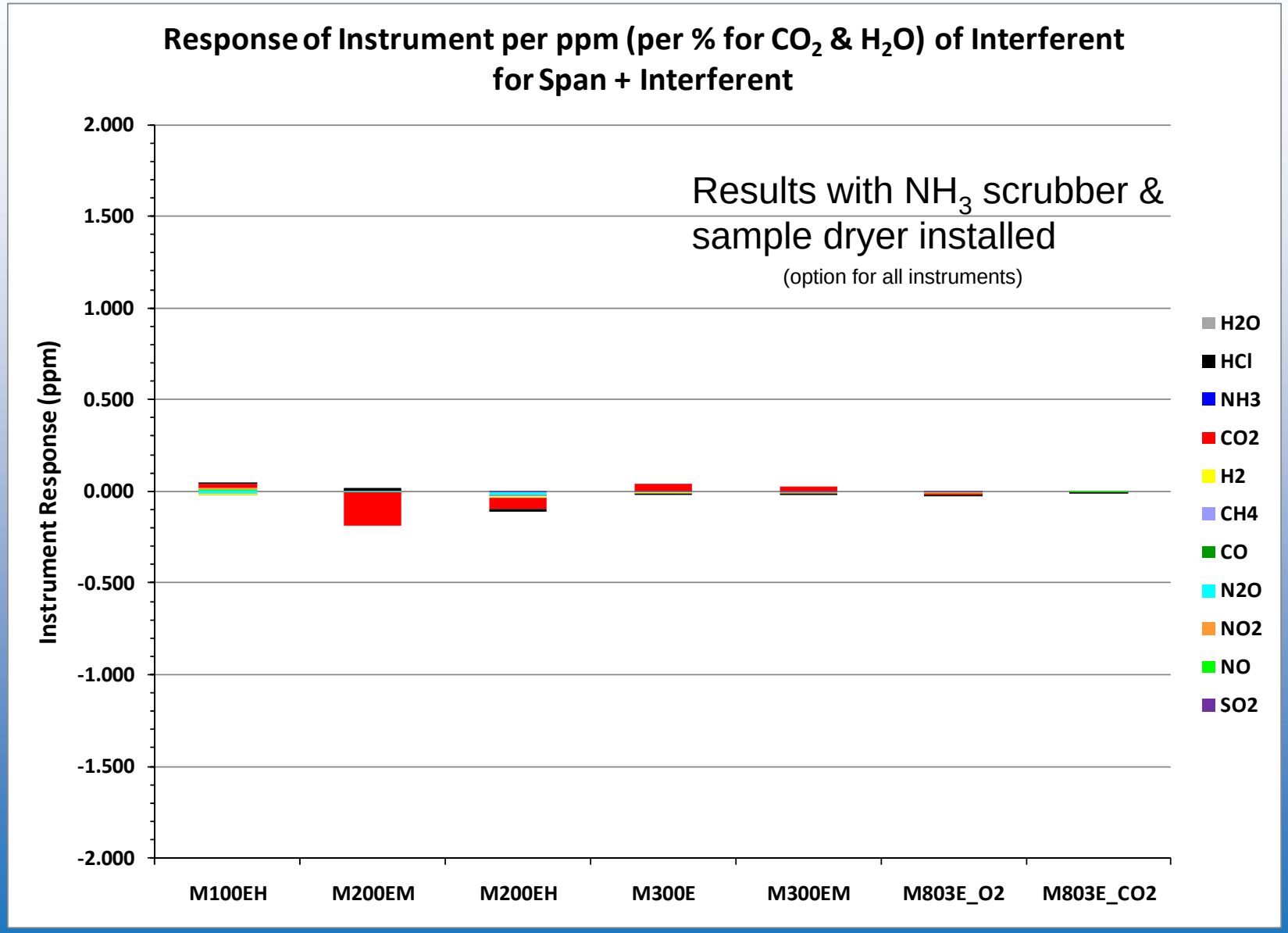
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Span + Interferent: Instrument Response / ppm



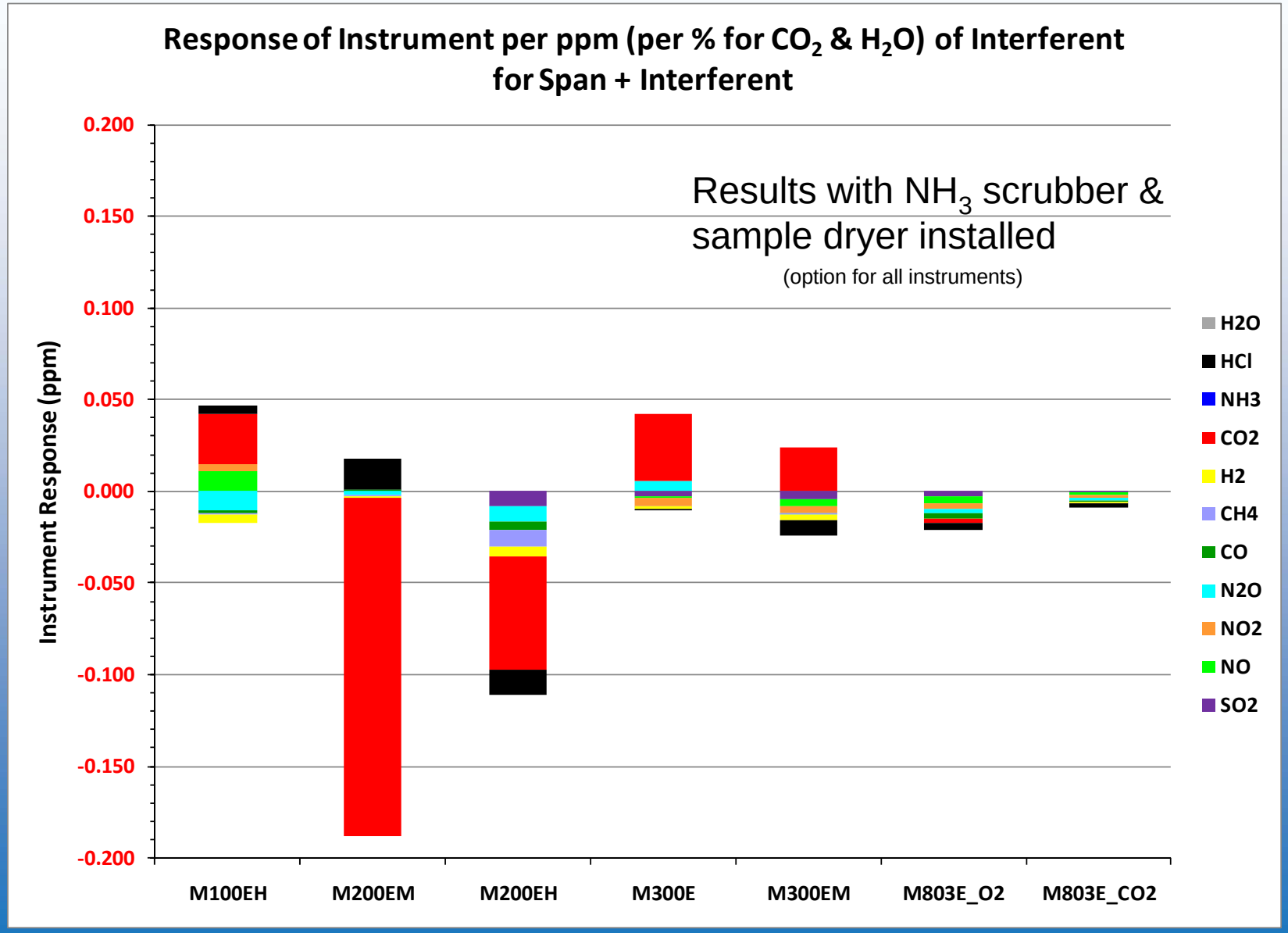
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Span + Interferent: Instrument Response / ppm



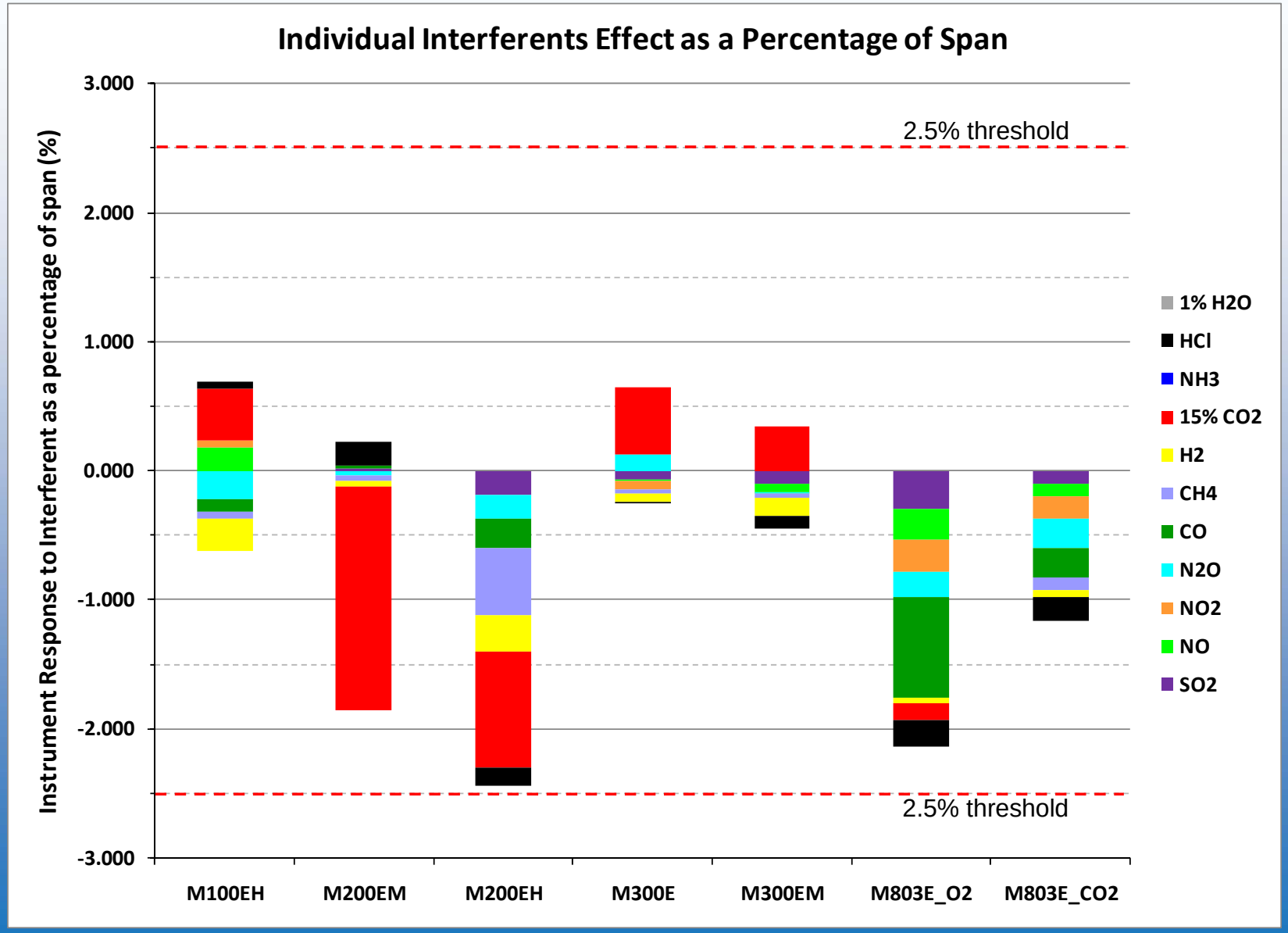
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Span + Interferent: Instrument Response / ppm



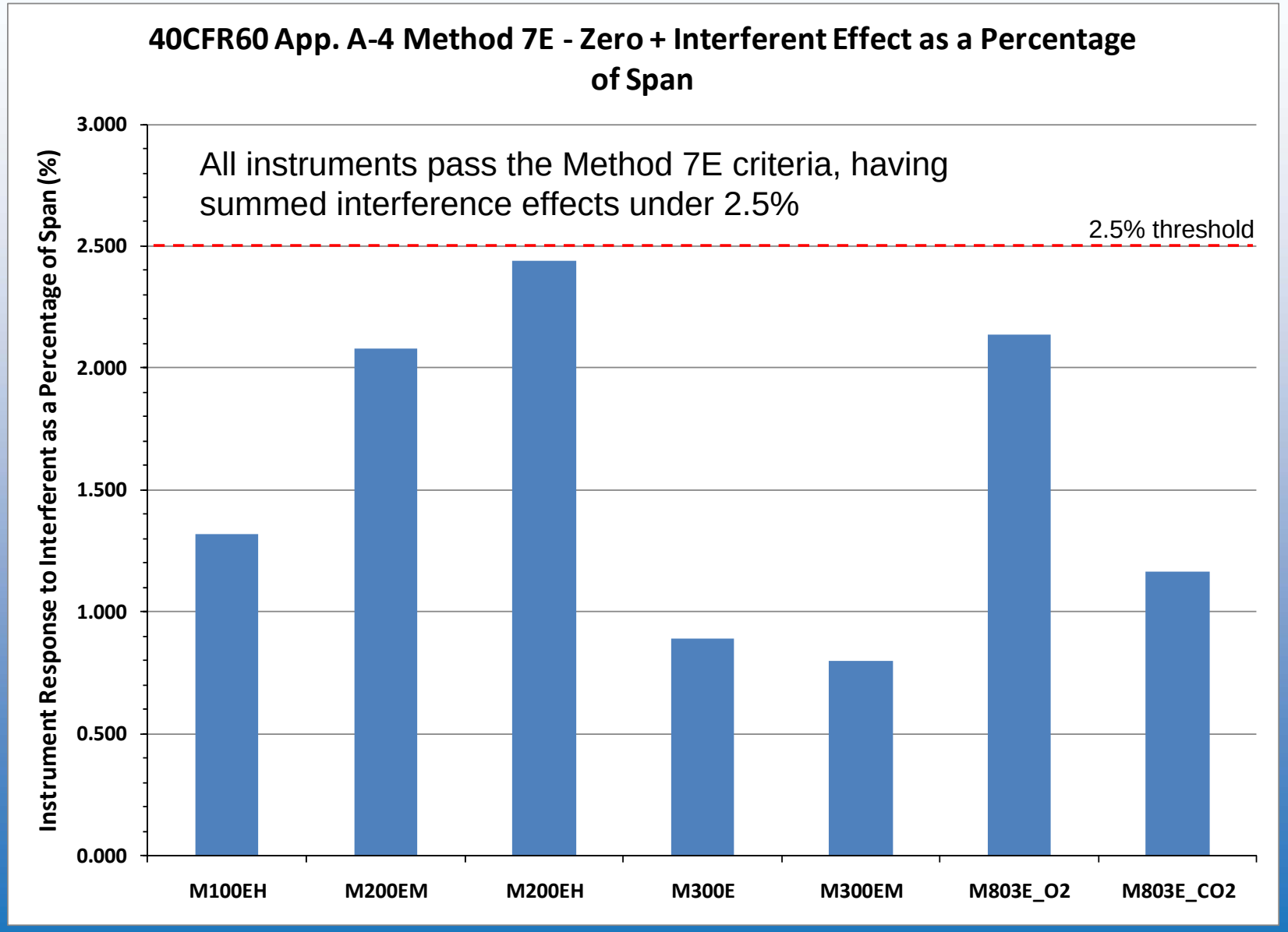
TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Span + Interferent: 40CFR60 App. 4-A Method 7E



TELEDYNE
ADVANCED POLLUTION INSTRUMENTATION
A Teledyne Technologies Company

Span + Interferent: 40CFR60 App. 4-A Method 7E



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Conclusions

- 40CFR60 App. A-4 Method 7E interference testing
  - Relatively straightforward to perform
  - Huge investment in the time & resources involved to ensure quality experimental setup, execution, and data analysis
- Interference test results
  - Show that the Teledyne – API instruments common to RATA and CEMS applications meet the interference effect criteria defined by 40CFR60 App. A-4 Method 7E
- For the Zero + Interferent tests
  - The instruments perform well within the criteria
    - Shows that the primary effect of interferences is not due to the interferent gas producing a signal on its own

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Conclusions

- For the Span + Interferent tests
  - Some of the instruments (M100EH, M300E, M300EM, M803E(CO_2), perform well within the criteria
  - The NO_x instruments (especially the M200EH) are close to the threshold
    - It should be noted that this is for all interferent gasses combined at their max (worst case scenerio)
  - Shows why RATA analyzers need to be calibrated under the same conditions as the CEMS instruments for proper comparison

- Future Directions
  - Further investigate the cause of specific interferences and how to reduce their effect

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Acknowledgements

- Teledyne – API Engineering & Sales
  - Pat King
  - Robin Becker
  - David Neuschuler
  - Kirk Lovewell
  - Jeff Franks
  - Bill Taylor
  - Martin Abbott

APPENDIX G

PROCESS OPERATION DATA

Juno Stack Tests: Carbon Adsorber Beds Monthly Performance & Emission Factor Verification - July 2023 - Operations Logsheet

Date last activated carbon media replacment: 6/2/2023

Number of batches processed since last Activated Carbon Media (ACM) replacment at start of test: 112 (as of 7/12/2023 8:30 AM - start time of 1st test batch)

Test Batch	# Batches since Last ACM Replacement	Date	Batch Size						Production Rate	Batch Step Times (HR:MIN AM/PM)				Comments
			# Bales			Weight (lb)				BATCH START TIME Start JC Loading	JC Door Closing at Start of Cook	JC Door Opening at End of Cook	BATCH END TIME JC Discharge Complete	
#	#	(MM/DD/YY)	OCC	MSW	Total	OCC	MSW	Total	(tons/batch)					
1	113	7/12/2023	0	18	18	0	39,800	39,800	19.9	8:48am	9:00am	10:30am	11:14am	
2	114	7/12/2023	0	18	18	0	42,300	42,300	21.2	12:10pm	12:24pm	1:50pm	2:34pm	
3	115	7/12/2023	0	18	18	0	42,080	42,080	21.0	3:30pm	3:46pm	5:18pm	5:57pm	

Juno Stack Test Parameters

Monthly - July 2023

7/12/23 8:48
7/12/23 17:58
1m

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 08:48:00	13.0	124.7	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:49:00	13.0	124.5	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:50:00	13.0	124.3	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:51:00	13.0	124.1	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:52:00	13.0	124.0	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:53:00	13.0	123.7	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:54:00	13.0	123.5	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:55:00	13.0	123.3	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:56:00	13.0	123.1	3.0	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:57:00	13.0	122.9	3.1	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:58:00	13.0	122.6	3.1	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 08:59:00	13.0	122.3	3.1	17.1	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:00:00	12.0	122.1	3.5	17.9	76.2	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:01:00	7.8	121.8	4.0	33.2	94.7	24.6	9.7	9.7	50	1	1	0.0
12-Jul-23 09:02:00	3.9	121.4	3.7	53.3	95.0	23.8	9.7	9.8	50	1	1	0.0
12-Jul-23 09:03:00	3.0	121.2	3.3	65.0	35.1	20.8	9.7	9.7	50	1	1	0.0
12-Jul-23 09:04:00	4.1	121.8	3.3	59.3	0.0	20.2	9.7	9.7	50	1	0	0.0
12-Jul-23 09:05:00	6.1	133.4	3.3	46.0	0.0	20.0	9.7	9.7	50	1	0	0.0
12-Jul-23 09:06:00	10.8	161.0	3.3	32.5	0.0	20.0	9.7	9.7	50	1	0	0.0
12-Jul-23 09:07:00	18.8	191.3	3.3	20.9	0.0	21.8	9.7	9.7	50	1	0	0.0
12-Jul-23 09:08:00	28.4	219.0	3.2	17.0	0.0	24.2	9.7	9.7	50	1	0	0.0
12-Jul-23 09:09:00	38.0	242.0	3.2	16.8	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:10:00	47.2	259.8	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:11:00	56.7	274.0	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:12:00	65.7	285.9	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:13:00	70.3	295.3	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:14:00	69.0	297.8	3.1	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:15:00	67.7	297.4	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:16:00	65.3	296.8	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:17:00	62.2	295.0	3.2	16.9	0.0	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:18:00	59.8	292.2	3.2	16.9	-0.1	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:19:00	58.1	289.6	3.2	16.9	-0.1	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:20:00	56.8	287.3	3.3	16.9	-0.1	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:21:00	55.3	285.0	3.3	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:22:00	54.3	282.9	3.3	16.9	-0.1	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:23:00	53.5	281.0	3.3	16.9	-0.1	24.3	9.7	9.7	50	1	0	0.0
12-Jul-23 09:24:00	52.7	279.3	3.3	16.9	0.0	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:25:00	52.0	277.9	3.3	16.9	0.0	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:26:00	51.5	276.6	3.3	16.9	-0.2	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:27:00	51.0	275.6	3.3	16.9	-0.8	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:28:00	50.6	274.7	3.3	16.9	-0.4	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:29:00	50.1	273.8	3.2	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:30:00	49.8	273.1	3.2	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:31:00	49.4	272.3	3.3	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:32:00	49.2	271.6	3.3	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 09:33:00	49.1	270.9	3.4	16.9	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:34:00	49.4	270.3	3.4	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:35:00	49.7	270.2	3.4	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:36:00	50.0	270.6	3.4	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:37:00	50.7	271.1	3.4	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:38:00	51.6	273.0	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:39:00	52.4	275.0	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:40:00	52.9	277.0	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:41:00	52.5	277.7	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:42:00	52.2	277.1	3.3	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:43:00	51.7	276.0	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:44:00	51.2	274.6	3.3	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:45:00	50.8	273.3	3.2	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:46:00	50.5	272.1	3.3	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:47:00	50.3	271.1	3.3	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:48:00	50.4	270.4	3.4	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:49:00	50.9	270.2	3.4	17.0	-0.1	24.3	9.6	9.7	50	1	0	0.0
12-Jul-23 09:50:00	51.5	270.6	3.4	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:51:00	52.1	271.3	3.4	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:52:00	52.8	273.3	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:53:00	53.4	275.3	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:54:00	53.9	276.7	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:55:00	53.5	276.6	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:56:00	53.0	276.1	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:57:00	52.7	275.2	3.5	17.0	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:58:00	52.4	274.2	3.5	17.1	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 09:59:00	52.1	273.0	3.5	17.1	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:00:00	52.1	272.1	3.5	17.1	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:01:00	52.3	271.4	3.5	17.1	-0.1	24.2	9.6	9.6	50	1	0	0.0
12-Jul-23 10:02:00	52.5	270.9	3.6	17.1	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:03:00	52.6	270.5	3.6	17.1	-0.1	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:04:00	52.8	270.4	3.6	17.1	-0.1	24.2	9.6	9.6	50	1	0	0.0
12-Jul-23 10:05:00	53.1	270.6	3.6	17.1	0.0	24.2	9.6	9.6	50	1	0	0.0
12-Jul-23 10:06:00	53.5	271.3	3.5	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:07:00	53.9	272.5	3.5	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:08:00	54.4	274.2	3.5	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:09:00	54.8	275.5	3.6	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:10:00	54.8	275.7	3.6	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:11:00	54.4	275.2	3.6	17.1	0.0	24.2	9.6	9.6	50	1	0	0.0
12-Jul-23 10:12:00	53.9	274.6	3.6	17.1	0.0	24.3	9.6	9.6	50	1	0	0.0
12-Jul-23 10:13:00	53.2	273.9	3.6	17.1	50.6	24.3	9.6	9.6	50	1	0	14.0
12-Jul-23 10:14:00	45.9	272.4	3.9	27.6	98.2	24.5	9.6	9.6	50	1	0	38.0
12-Jul-23 10:15:00	35.1	267.3	4.0	49.6	99.0	24.4	9.6	9.6	50	1	0	62.0
12-Jul-23 10:16:00	26.2	259.0	3.7	64.5	99.7	21.2	9.6	9.6	50	1	0	86.0
12-Jul-23 10:17:00	20.3	252.0	3.7	72.9	89.6	20.4	9.6	9.6	50	1	0	100.0
12-Jul-23 10:18:00	16.3	247.5	3.7	78.8	86.3	20.5	9.6	9.6	50	1	0	100.0
12-Jul-23 10:19:00	13.3	245.7	3.6	83.9	86.5	20.6	9.6	9.6	50	1	0	100.0
12-Jul-23 10:20:00	11.2	244.1	3.5	88.8	86.6	20.7	9.6	9.6	50	1	0	100.0
12-Jul-23 10:21:00	9.6	242.6	3.5	93.8	87.2	20.8	9.6	9.6	50	1	0	100.0
12-Jul-23 10:22:00	8.3	241.0	3.4	98.6	99.4	20.9	9.6	9.6	50	1	0	100.0
12-Jul-23 10:23:00	7.3	239.4	3.4	99.9	98.9	21.0	9.6	9.6	50	1	0	100.0
12-Jul-23 10:24:00	6.4	237.8	3.5	100.1	98.3	21.0	9.6	9.6	50	1	0	100.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 10:25:00	6.3	236.7	3.5	100.0	98.6	21.1	9.6	9.6	50	1	0	66.7
12-Jul-23 10:26:00	7.3	235.7	3.4	100.0	13.8	21.0	9.6	9.6	50	1	0	0.0
12-Jul-23 10:27:00	11.2	234.7	3.4	97.8	0.1	20.9	9.6	9.6	50	1	0	0.0
12-Jul-23 10:28:00	13.8	233.9	3.4	85.2	0.0	20.7	9.6	9.6	50	1	0	0.0
12-Jul-23 10:29:00	14.0	233.1	3.4	71.1	0.0	20.4	9.6	9.6	50	1	0	0.0
12-Jul-23 10:30:00	14.0	232.3	3.4	57.1	0.0	20.2	9.6	9.6	50	1	0	0.0
12-Jul-23 10:31:00	14.0	231.4	3.4	43.3	0.0	20.0	9.5	9.6	50	1	0	0.0
12-Jul-23 10:32:00	14.0	230.6	3.4	30.0	0.0	20.1	9.4	9.4	50	1	0	0.0
12-Jul-23 10:33:00	14.0	229.7	3.5	19.5	0.0	22.4	9.4	9.5	50	1	0	0.0
12-Jul-23 10:34:00	13.9	228.8	3.5	16.8	-0.3	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 10:35:00	13.9	227.9	3.5	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 10:36:00	13.9	227.1	3.6	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 10:37:00	13.9	226.3	3.5	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 10:38:00	13.9	225.6	3.5	16.8	0.0	24.3	9.4	9.5	50	1	0	0.0
12-Jul-23 10:39:00	13.9	224.9	3.5	16.8	-0.2	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 10:40:00	13.9	224.2	3.6	16.8	-0.1	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 10:41:00	13.9	223.5	3.7	16.8	-0.1	24.3	9.4	9.5	50	1	0	0.0
12-Jul-23 10:42:00	13.9	222.8	3.6	16.8	-0.2	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 10:43:00	13.9	222.1	3.6	16.8	-0.2	24.3	9.4	9.5	50	1	0	0.0
12-Jul-23 10:44:00	13.9	221.3	3.6	16.8	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:45:00	13.9	220.6	3.7	16.8	-0.6	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 10:46:00	13.8	219.8	3.6	16.8	-0.5	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:47:00	13.8	219.0	3.7	16.8	-0.4	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 10:48:00	13.8	218.3	3.7	16.8	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:49:00	13.8	217.6	3.7	16.8	-0.5	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:50:00	13.8	216.9	3.7	16.8	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:51:00	13.8	216.3	3.7	16.8	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:52:00	13.8	215.6	3.7	16.8	-0.2	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:53:00	13.8	215.0	3.8	16.8	-0.3	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:54:00	13.8	214.3	3.8	16.8	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 10:55:00	13.8	213.7	3.7	16.8	-0.4	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 10:56:00	13.8	213.0	3.7	16.8	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 10:57:00	13.7	212.3	3.7	16.8	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 10:58:00	13.7	211.7	3.8	16.8	0.0	24.3	9.4	9.5	50	1	0	0.0
12-Jul-23 10:59:00	13.7	211.1	3.8	16.9	-0.8	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:00:00	13.7	210.5	3.7	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:01:00	13.7	209.9	3.7	16.9	-0.5	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:02:00	13.7	209.3	3.7	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:03:00	13.7	208.7	3.7	16.9	-0.3	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:04:00	13.7	208.1	3.7	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:05:00	13.7	207.5	3.7	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:06:00	13.7	207.0	3.6	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:07:00	13.7	206.4	3.6	16.9	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:08:00	13.7	205.8	3.6	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:09:00	13.6	205.3	3.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:10:00	13.6	204.7	3.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:11:00	13.6	204.2	3.7	16.9	-0.8	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:12:00	13.6	203.7	3.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:13:00	13.6	203.1	3.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:14:00	13.6	202.6	3.8	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:15:00	13.6	202.1	3.8	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:16:00	13.6	201.5	3.9	16.9	-0.7	24.2	9.4	9.5	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 11:17:00	13.6	201.0	4.0	16.9	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 11:18:00	13.6	200.5	4.1	16.9	-0.7	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 11:19:00	13.6	200.0	4.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:20:00	13.6	199.4	4.1	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:21:00	13.5	198.9	4.1	16.9	-0.7	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:22:00	13.5	198.4	4.1	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:23:00	13.5	198.0	4.0	16.9	-0.7	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:24:00	13.5	197.5	4.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:25:00	13.5	197.0	4.0	16.9	-0.7	24.2	9.5	9.4	50	1	0	0.0
12-Jul-23 11:26:00	13.5	196.5	4.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:27:00	13.5	196.1	3.9	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:28:00	13.5	195.6	4.0	16.9	-0.7	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:29:00	13.5	195.2	4.1	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:30:00	13.5	194.7	4.0	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:31:00	13.5	194.2	4.0	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:32:00	13.4	193.8	4.1	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:33:00	13.4	193.3	4.1	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:34:00	13.4	192.9	4.0	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:35:00	13.4	192.4	4.1	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:36:00	13.4	192.1	4.1	16.9	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:37:00	13.4	191.6	4.1	16.9	-0.2	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:38:00	13.4	191.2	4.1	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:39:00	13.4	190.8	4.1	16.9	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:40:00	13.4	190.4	4.1	16.9	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:41:00	13.4	190.0	4.1	16.9	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:42:00	13.4	189.6	4.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:43:00	13.4	189.2	4.1	16.9	-0.8	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:44:00	13.3	188.8	4.1	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:45:00	13.3	188.4	4.2	17.0	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:46:00	13.3	188.1	4.3	17.0	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:47:00	13.3	187.7	4.3	17.0	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:48:00	13.3	187.3	4.2	17.0	-0.8	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:49:00	13.3	186.9	4.2	17.0	-0.7	24.3	9.4	9.5	50	1	0	0.0
12-Jul-23 11:50:00	13.3	186.5	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:51:00	13.3	186.2	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:52:00	13.3	185.8	4.2	17.0	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:53:00	13.3	185.5	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:54:00	13.3	185.1	4.2	17.0	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:55:00	13.3	184.8	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:56:00	13.2	184.4	4.2	17.0	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 11:57:00	13.2	184.1	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:58:00	13.2	183.8	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 11:59:00	13.2	183.4	4.2	17.0	-0.1	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:00:00	13.2	183.1	4.3	17.0	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:01:00	13.2	182.8	4.4	17.0	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:02:00	13.2	182.4	4.3	17.0	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:03:00	13.2	182.1	4.3	17.0	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:04:00	13.2	181.8	4.3	17.0	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:05:00	13.2	181.5	4.4	17.0	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:06:00	13.2	181.2	4.5	17.0	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:07:00	13.1	180.8	4.5	17.0	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:08:00	13.1	180.5	4.4	17.0	0.0	24.3	9.4	9.4	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 12:09:00	13.1	180.2	4.4	17.0	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:10:00	13.1	179.9	4.5	17.1	0.0	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 12:11:00	13.1	179.6	4.5	17.1	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:12:00	13.1	179.3	4.6	17.1	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:13:00	13.1	179.0	4.6	17.1	0.0	24.3	9.5	9.4	50	1	0	0.0
12-Jul-23 12:14:00	13.1	178.6	4.6	17.1	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:15:00	13.1	178.2	4.6	17.1	0.0	24.3	9.4	9.4	50	1	0	0.0
12-Jul-23 12:16:00	13.1	177.9	4.6	17.1	0.0	24.2	9.5	9.4	50	1	0	0.0
12-Jul-23 12:17:00	13.1	177.4	4.6	17.1	0.0	24.2	9.5	9.4	50	1	0	0.0
12-Jul-23 12:18:00	13.1	177.0	4.6	17.1	0.0	24.3	9.5	9.4	50	1	0	0.0
12-Jul-23 12:19:00	13.0	176.5	4.7	17.1	0.0	24.3	9.5	9.4	50	1	0	0.0
12-Jul-23 12:20:00	13.0	176.0	4.6	17.1	0.0	24.2	9.5	9.4	50	1	0	0.0
12-Jul-23 12:21:00	13.0	175.5	4.6	17.1	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:22:00	13.0	175.0	4.4	17.1	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:23:00	13.0	174.4	4.5	17.1	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:24:00	12.6	173.9	4.8	17.1	52.6	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:25:00	8.8	173.3	5.5	28.2	92.1	24.5	9.5	9.5	50	1	1	0.0
12-Jul-23 12:26:00	4.8	172.6	5.2	48.5	93.9	24.5	9.5	9.5	50	1	1	0.0
12-Jul-23 12:27:00	3.4	172.0	4.8	62.8	56.4	21.3	9.5	9.5	50	1	1	0.0
12-Jul-23 12:28:00	4.4	171.4	4.5	61.4	-0.8	20.1	9.5	9.5	50	1	0	0.0
12-Jul-23 12:29:00	6.5	171.4	4.5	48.1	-0.8	19.9	9.5	9.5	50	1	0	0.0
12-Jul-23 12:30:00	11.0	177.2	4.5	34.4	-0.3	19.8	9.5	9.5	50	1	0	0.0
12-Jul-23 12:31:00	19.1	197.1	4.4	22.2	0.0	21.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:32:00	28.7	221.9	4.4	17.0	0.0	24.1	9.5	9.5	50	1	0	0.0
12-Jul-23 12:33:00	39.7	244.0	4.4	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:34:00	51.1	263.5	4.3	16.7	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:35:00	61.7	279.1	4.4	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:36:00	68.6	291.5	4.4	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:37:00	67.6	296.6	4.4	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:38:00	66.3	296.5	4.4	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:39:00	63.6	295.8	4.3	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:40:00	59.6	293.5	4.3	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:41:00	56.2	289.9	4.2	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:42:00	53.9	286.2	4.2	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:43:00	52.2	283.6	4.2	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:44:00	51.1	281.2	4.2	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:45:00	50.2	279.1	4.3	16.8	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:46:00	49.3	277.5	4.4	16.8	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:47:00	48.5	276.0	4.4	16.9	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:48:00	47.9	274.7	4.5	16.9	0.0	24.3	9.5	9.5	50	1	0	0.0
12-Jul-23 12:49:00	47.2	273.5	4.5	16.9	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:50:00	46.6	272.4	4.6	16.9	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:51:00	46.1	271.4	4.6	16.9	-0.2	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:52:00	46.3	270.5	4.6	16.9	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:53:00	46.6	269.8	4.6	16.9	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:54:00	46.8	269.3	4.5	16.9	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:55:00	47.5	270.1	4.4	16.9	-0.5	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:56:00	49.0	271.9	4.4	16.9	-0.3	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:57:00	50.3	273.9	4.5	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:58:00	50.9	275.9	4.5	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 12:59:00	50.6	277.4	4.4	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:00:00	50.4	277.7	4.4	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 13:01:00	50.1	277.1	4.5	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:02:00	49.8	276.2	4.4	16.9	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:03:00	49.3	274.6	4.4	17.0	-0.3	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:04:00	49.1	273.0	4.4	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:05:00	49.3	271.7	4.4	17.0	-0.3	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:06:00	49.6	270.8	4.4	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:07:00	49.8	270.3	4.3	17.0	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:08:00	50.2	271.5	4.3	17.0	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:09:00	50.7	272.5	4.4	17.0	-0.7	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:10:00	51.3	273.8	4.4	17.0	-0.6	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:11:00	51.9	275.2	4.4	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:12:00	51.8	276.3	4.4	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:13:00	51.7	276.8	4.4	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:14:00	51.5	276.3	4.5	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:15:00	51.3	275.5	4.4	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:16:00	51.1	274.4	4.3	17.0	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:17:00	51.1	273.2	4.3	17.0	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:18:00	51.3	272.3	4.3	17.0	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:19:00	51.5	271.5	4.3	17.0	0.0	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:20:00	51.6	271.1	4.3	17.0	-0.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:21:00	51.8	271.3	4.3	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:22:00	52.0	271.6	4.2	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:23:00	52.4	271.8	4.2	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:24:00	52.7	272.3	4.2	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:25:00	53.0	273.4	4.2	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:26:00	52.9	274.5	4.3	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:27:00	52.8	275.6	4.3	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:28:00	52.7	275.4	4.4	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:29:00	52.6	274.6	4.4	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:30:00	52.5	273.9	4.3	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:31:00	52.4	273.3	4.4	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:32:00	52.4	272.6	4.4	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:33:00	52.3	271.9	4.5	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:34:00	52.2	271.4	4.5	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:35:00	52.1	270.9	4.5	17.0	-0.8	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 13:36:00	51.7	270.5	4.5	17.1	53.4	24.2	9.5	9.5	50	1	0	14.0
12-Jul-23 13:37:00	44.7	269.7	4.9	28.0	95.7	24.5	9.5	9.5	50	1	0	38.0
12-Jul-23 13:38:00	34.7	265.7	4.8	49.2	96.0	24.4	9.5	9.5	50	1	0	62.0
12-Jul-23 13:39:00	26.4	257.6	4.5	63.7	96.9	21.3	9.5	9.5	50	1	0	86.0
12-Jul-23 13:40:00	20.7	250.5	4.5	71.5	83.8	20.4	9.5	9.5	50	1	0	100.0
12-Jul-23 13:41:00	16.6	246.0	4.5	76.2	82.5	20.5	9.5	9.5	50	1	0	100.0
12-Jul-23 13:42:00	13.8	243.3	4.5	80.5	83.3	20.5	9.5	9.5	50	1	0	100.0
12-Jul-23 13:43:00	11.6	242.1	4.4	84.8	81.8	20.6	9.5	9.5	50	1	0	100.0
12-Jul-23 13:44:00	10.0	240.9	4.4	88.7	82.7	20.7	9.5	9.5	50	1	0	100.0
12-Jul-23 13:45:00	8.7	239.6	4.4	93.0	93.4	20.7	9.5	9.5	50	1	0	100.0
12-Jul-23 13:46:00	7.6	238.3	4.4	98.7	96.2	20.9	9.5	9.5	50	1	0	100.0
12-Jul-23 13:47:00	6.7	237.4	4.4	100.1	96.6	20.9	9.5	9.5	50	1	0	100.0
12-Jul-23 13:48:00	6.2	236.5	4.4	100.3	95.3	20.9	9.5	9.5	50	1	0	66.7
12-Jul-23 13:49:00	7.1	235.6	4.3	100.3	22.8	21.0	9.5	9.5	50	1	0	0.0
12-Jul-23 13:50:00	11.0	234.7	4.2	97.9	-0.6	20.8	9.5	9.5	50	1	0	0.0
12-Jul-23 13:51:00	13.8	233.9	4.2	85.4	-0.8	20.6	9.5	9.5	50	1	0	0.0
12-Jul-23 13:52:00	14.0	233.1	4.3	71.2	-0.7	20.4	9.5	9.5	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 13:53:00	14.0	232.3	4.3	57.0	-0.6	20.1	9.3	9.3	50	1	0	0.0
12-Jul-23 13:54:00	14.0	231.5	4.2	43.2	-0.8	19.9	9.4	9.4	50	1	0	0.0
12-Jul-23 13:55:00	14.0	230.6	4.3	29.8	-0.7	20.0	9.4	9.4	50	1	0	0.0
12-Jul-23 13:56:00	14.0	229.8	4.3	19.3	-0.7	22.5	9.4	9.4	50	1	0	0.0
12-Jul-23 13:57:00	13.9	229.0	4.3	16.8	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 13:58:00	13.9	228.3	4.3	16.8	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 13:59:00	13.9	227.5	4.3	16.8	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:00:00	13.9	226.7	4.3	16.8	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:01:00	13.9	225.9	4.3	16.8	-0.6	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:02:00	13.9	225.1	4.2	16.8	-0.2	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:03:00	13.9	224.4	4.3	16.8	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:04:00	13.9	223.7	4.3	16.8	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:05:00	13.9	222.9	4.3	16.8	-0.3	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:06:00	13.9	222.2	4.4	16.8	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:07:00	13.9	221.5	4.4	16.8	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:08:00	13.9	220.8	4.3	16.8	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:09:00	13.8	220.1	4.3	16.8	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:10:00	13.8	219.4	4.3	16.8	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:11:00	13.8	218.7	4.4	16.8	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:12:00	13.8	218.1	4.3	16.8	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:13:00	13.8	217.4	4.3	16.8	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:14:00	13.8	216.7	4.3	16.8	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:15:00	13.8	216.0	4.4	16.9	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:16:00	13.8	215.3	4.4	16.9	-0.8	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:17:00	13.8	214.7	4.4	16.9	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:18:00	13.8	214.0	4.4	16.9	-0.7	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:19:00	13.8	213.4	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:20:00	13.7	212.7	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:21:00	13.7	212.0	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:22:00	13.7	211.4	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:23:00	13.7	210.8	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:24:00	13.7	210.2	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:25:00	13.7	209.5	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:26:00	13.7	208.9	4.4	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:27:00	13.7	208.3	4.3	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:28:00	13.7	207.7	4.3	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:29:00	13.7	207.1	4.2	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:30:00	13.7	206.5	4.2	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:31:00	13.7	205.9	4.2	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:32:00	13.6	205.3	4.3	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:33:00	13.6	204.8	4.3	16.9	-0.7	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:34:00	13.6	204.2	4.2	16.9	-0.6	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:35:00	13.6	203.7	4.2	16.9	-0.6	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:36:00	13.6	203.1	4.2	16.9	-0.6	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:37:00	13.6	202.6	4.2	16.9	-0.6	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:38:00	13.6	202.1	4.2	16.9	-0.6	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:39:00	13.6	201.6	4.3	16.9	-0.6	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:40:00	13.6	201.1	4.2	16.9	-0.6	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:41:00	13.6	200.6	4.2	16.9	-0.6	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:42:00	13.6	200.1	4.2	16.9	-0.1	24.2	9.3	9.3	50	1	0	0.0
12-Jul-23 14:43:00	13.6	199.6	4.2	16.9	-0.6	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:44:00	13.5	199.1	4.2	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 14:45:00	13.5	198.7	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:46:00	13.5	198.2	4.3	16.9	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:47:00	13.5	197.7	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:48:00	13.5	197.2	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:49:00	13.5	196.7	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:50:00	13.5	196.2	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:51:00	13.5	195.7	4.3	16.9	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 14:52:00	13.5	195.2	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:53:00	13.5	194.8	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:54:00	13.5	194.3	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:55:00	13.4	193.9	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:56:00	13.4	193.4	4.3	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:57:00	13.4	193.0	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:58:00	13.4	192.5	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 14:59:00	13.4	192.1	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:00:00	13.4	191.7	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:01:00	13.4	191.3	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:02:00	13.4	190.9	4.4	16.9	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:03:00	13.4	190.4	4.4	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:04:00	13.4	190.0	4.5	16.9	-0.2	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:05:00	13.4	189.6	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:06:00	13.4	189.2	4.4	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:07:00	13.3	188.8	4.5	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:08:00	13.3	188.4	4.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:09:00	13.3	188.0	4.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:10:00	13.3	187.6	4.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:11:00	13.3	187.2	4.6	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:12:00	13.3	186.8	4.7	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:13:00	13.3	186.5	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:14:00	13.3	186.1	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:15:00	13.3	185.7	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:16:00	13.3	185.3	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:17:00	13.3	185.0	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:18:00	13.2	184.6	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:19:00	13.2	184.3	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:20:00	13.2	184.0	4.8	16.9	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 15:21:00	13.2	183.6	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:22:00	13.2	183.2	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:23:00	13.2	182.9	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:24:00	13.2	182.6	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:25:00	13.2	182.2	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:26:00	13.2	181.9	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:27:00	13.2	181.5	4.8	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:28:00	13.2	181.2	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:29:00	13.2	180.9	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:30:00	13.1	180.6	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:31:00	13.1	180.2	5.0	16.9	-0.8	24.2	9.4	9.3	50	1	0	0.0
12-Jul-23 15:32:00	13.1	179.9	5.1	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:33:00	13.1	179.6	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:34:00	13.1	179.2	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:35:00	13.1	178.9	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:36:00	13.1	178.5	5.1	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 15:37:00	13.1	178.1	5.1	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:38:00	13.1	177.6	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:39:00	13.1	177.1	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:40:00	13.1	176.6	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:41:00	13.0	176.1	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:42:00	13.0	175.6	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:43:00	13.0	175.0	5.0	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:44:00	13.0	174.4	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:45:00	13.0	173.9	4.9	16.9	-0.8	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:46:00	13.0	173.3	4.9	16.9	-0.1	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:47:00	11.4	172.7	5.5	19.3	93.1	24.2	9.5	9.5	50	1	0	0.0
12-Jul-23 15:48:00	7.1	172.0	5.7	37.4	96.4	24.6	9.5	9.5	50	1	1	0.0
12-Jul-23 15:49:00	3.7	171.3	5.4	56.8	96.7	23.1	9.4	9.5	50	1	1	0.0
12-Jul-23 15:50:00	3.8	170.6	5.0	65.7	15.9	20.4	9.4	9.5	50	1	1	0.0
12-Jul-23 15:51:00	5.2	170.2	5.0	57.0	-0.7	20.1	9.4	9.4	50	1	0	0.0
12-Jul-23 15:52:00	8.1	171.5	4.9	43.5	-0.7	19.9	9.4	9.4	50	1	0	0.0
12-Jul-23 15:53:00	14.3	184.7	5.0	30.2	-0.7	20.0	9.4	9.4	50	1	0	0.0
12-Jul-23 15:54:00	23.0	208.2	5.0	19.4	-0.7	22.3	9.4	9.4	50	1	0	0.0
12-Jul-23 15:55:00	32.9	231.7	5.0	16.9	-0.7	24.1	9.4	9.5	50	1	0	0.0
12-Jul-23 15:56:00	42.1	251.6	5.1	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:57:00	51.7	267.2	5.1	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 15:58:00	61.6	280.3	5.1	16.9	-0.7	24.2	9.4	9.5	50	1	0	0.0
12-Jul-23 15:59:00	68.2	291.6	5.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:00:00	66.0	295.7	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:01:00	64.4	295.1	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:02:00	62.5	294.1	5.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:03:00	60.2	292.5	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:04:00	58.1	290.3	5.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:05:00	56.5	288.0	5.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:06:00	55.5	285.9	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:07:00	54.5	283.7	5.1	16.9	-0.7	24.1	9.4	9.5	50	1	0	0.0
12-Jul-23 16:08:00	53.7	281.7	5.1	16.9	-0.7	24.1	9.4	9.5	50	1	0	0.0
12-Jul-23 16:09:00	52.9	280.1	5.1	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:10:00	52.4	278.7	5.1	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:11:00	52.1	277.5	5.0	16.9	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:12:00	51.3	276.5	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:13:00	50.9	275.7	4.9	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:14:00	50.4	274.8	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:15:00	50.1	274.1	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:16:00	49.7	273.4	5.0	16.9	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:17:00	49.3	272.8	5.0	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:18:00	49.1	272.1	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:19:00	49.2	271.4	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:20:00	49.4	270.8	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:21:00	49.6	270.3	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:22:00	49.8	270.2	5.1	17.0	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:23:00	50.2	270.8	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:24:00	51.1	272.0	5.1	17.0	-0.7	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:25:00	52.0	274.3	5.1	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:26:00	52.8	276.5	5.2	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:27:00	52.6	277.8	5.2	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:28:00	52.2	277.5	5.2	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 16:29:00	51.8	276.9	5.2	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:30:00	51.4	275.7	5.3	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:31:00	51.1	274.3	5.3	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:32:00	51.2	273.0	5.3	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:33:00	51.3	272.0	5.4	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:34:00	51.5	271.3	5.4	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:35:00	51.6	270.7	5.4	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:36:00	51.7	270.3	5.4	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:37:00	51.9	270.4	5.4	17.0	-0.7	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:38:00	52.2	271.7	5.3	17.0	-0.2	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:39:00	52.9	273.4	5.2	17.0	-0.1	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:40:00	53.4	275.3	5.3	17.0	-0.4	24.2	9.4	9.4	50	1	0	0.0
12-Jul-23 16:41:00	53.8	276.7	5.4	17.0	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:42:00	53.6	276.6	5.3	17.0	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:43:00	53.1	276.1	5.4	17.0	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:44:00	52.8	275.2	5.4	17.0	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:45:00	52.5	274.2	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:46:00	52.3	273.2	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:47:00	52.1	272.5	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:48:00	52.2	271.9	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:49:00	52.4	271.5	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:50:00	52.6	271.1	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:51:00	52.9	271.2	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:52:00	53.1	271.5	5.4	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:53:00	53.5	271.8	5.3	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:54:00	53.9	272.4	5.2	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:55:00	54.2	273.8	5.2	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:56:00	54.5	274.8	5.4	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:57:00	54.8	274.7	5.4	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:58:00	54.6	274.5	5.4	17.1	-0.8	24.1	9.4	9.4	50	1	0	0.0
12-Jul-23 16:59:00	53.6	274.2	5.3	17.1	50.4	24.1	9.4	9.4	50	1	0	14.0
12-Jul-23 17:00:00	46.3	273.0	5.8	28.0	97.4	24.4	9.4	9.5	50	1	0	38.0
12-Jul-23 17:01:00	35.7	267.8	5.9	49.5	98.5	24.2	9.4	9.5	50	1	0	62.0
12-Jul-23 17:02:00	26.8	259.8	5.6	63.9	87.3	21.1	9.4	9.5	50	1	0	86.0
12-Jul-23 17:03:00	20.8	252.8	5.5	70.1	84.2	20.3	9.4	9.4	50	1	0	100.0
12-Jul-23 17:04:00	16.6	248.3	5.5	74.9	85.4	20.4	9.4	9.4	50	1	0	100.0
12-Jul-23 17:05:00	13.7	246.2	5.4	79.6	83.6	20.5	9.4	9.4	50	1	0	100.0
12-Jul-23 17:06:00	11.5	244.7	5.3	84.1	85.2	20.6	9.4	9.4	50	1	0	100.0
12-Jul-23 17:07:00	9.8	243.2	5.3	88.8	84.6	20.6	9.4	9.4	50	1	0	100.0
12-Jul-23 17:08:00	8.5	241.7	5.3	93.3	90.5	20.7	9.4	9.4	50	1	0	100.0
12-Jul-23 17:09:00	7.4	240.1	5.3	98.6	98.4	20.8	9.4	9.4	50	1	0	100.0
12-Jul-23 17:10:00	6.5	238.6	5.3	100.2	97.2	20.9	9.4	9.4	50	1	0	100.0
12-Jul-23 17:11:00	6.2	237.6	5.2	100.3	98.2	20.9	9.4	9.4	50	1	0	66.7
12-Jul-23 17:12:00	7.1	236.6	5.1	100.2	23.6	20.9	9.4	9.4	50	1	0	0.0
12-Jul-23 17:13:00	10.7	235.6	5.2	98.2	-0.8	20.8	9.4	9.4	50	1	0	0.0
12-Jul-23 17:14:00	13.7	234.8	5.2	85.9	-0.8	20.6	9.4	9.4	50	1	0	0.0
12-Jul-23 17:15:00	14.0	234.0	5.2	71.9	-0.8	20.3	9.4	9.4	50	1	0	0.0
12-Jul-23 17:16:00	14.0	233.2	5.2	57.7	-0.8	20.1	9.4	9.4	50	1	0	0.0
12-Jul-23 17:17:00	13.9	232.4	5.2	44.0	-0.8	19.8	9.2	9.2	50	1	0	0.0
12-Jul-23 17:18:00	13.9	231.5	5.2	30.6	-0.8	20.0	9.3	9.3	50	1	0	0.0
12-Jul-23 17:19:00	13.9	230.6	5.2	19.7	-0.8	22.2	9.2	9.2	50	1	0	0.0
12-Jul-23 17:20:00	13.9	229.8	5.3	16.9	-0.8	24.1	9.2	9.3	50	1	0	0.0

	Pressure	Temperature, Max	Scrubber dP	Scrubber Liquid Blowdown	Scrubber Liquid Recirculation Flow	Mill Water Flow	Cabon Asdsorption Filter dP	Cabon Asdsorption Filter dP	Inlet Damper to Blower	Blower to Carbon Bed Status	Pre-Vac Ejector Supply Valve Position	Post-Vac After Condenser Vent Pressure Control Valve
	psi	F	inH2O	Scrubber Sump Level Control % Open	gpm	gpm	inH2O	inH2O	%	0 or 1	0 or 1	%
12-Jul-23 17:21:00	13.9	229.1	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:22:00	13.9	228.4	5.2	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:23:00	13.8	227.8	5.2	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:24:00	13.8	227.1	5.1	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:25:00	13.8	226.4	5.0	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:26:00	13.8	225.7	5.1	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:27:00	13.8	225.1	5.0	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:28:00	13.8	224.4	5.0	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:29:00	13.7	223.7	5.1	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:30:00	13.7	223.0	5.2	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:31:00	13.7	222.2	5.2	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:32:00	13.7	221.5	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:33:00	13.7	220.8	5.2	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:34:00	13.7	220.0	5.3	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:35:00	13.6	219.2	5.2	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:36:00	13.6	218.4	5.2	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:37:00	13.6	217.7	5.2	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:38:00	13.6	216.9	5.2	16.8	-0.8	24.1	9.2	9.3	50	1	0	0.0
12-Jul-23 17:39:00	13.6	216.2	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:40:00	13.5	215.4	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:41:00	13.5	214.7	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:42:00	13.5	214.1	5.4	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:43:00	13.5	213.4	5.4	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:44:00	13.5	212.8	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:45:00	13.5	212.2	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:46:00	13.4	211.6	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:47:00	13.4	210.9	5.3	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:48:00	13.4	210.3	5.5	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:49:00	13.4	209.8	5.5	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:50:00	13.4	209.2	5.5	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:51:00	13.4	208.6	5.5	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:52:00	13.3	208.1	5.4	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:53:00	13.3	207.5	5.4	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:54:00	13.3	206.9	5.5	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:55:00	13.3	206.4	5.4	16.8	-0.8	24.1	9.2	9.2	50	1	0	0.0
12-Jul-23 17:56:00	13.3	205.9	5.4	16.8	-0.8	24.1	9.3	9.3	50	1	0	0.0
12-Jul-23 17:57:00	13.3	205.3	5.3	16.8	-0.8	24.1	9.3	9.3	50	1	0	0.0

APPENDIX H

SOURCE TEST PLAN AND APPROVAL

Advanced Industrial Resources, Inc.
Environmental Engineering
800-224-5007
www.airtest1.com

May 1st, 2023

Ms. Suzanne Blackburn
Oregon Department of Environmental Quality
Western Region (Salem Office)
4026 Fairview Industrial Drive Southeast
Salem, Oregon 97302

Regarding: Source Test Plan for EU 144 – Advanced Material Recycling System (aka Juno®)
Georgia-Pacific Toledo LLC
Permit No. 21-00005-TV-01

Dear Ms. Blackburn:

Please accept for review the Source Test Plan (STP) that accompanies this cover letter. The STP describes the protocols for conducting the permit required 30-batch cycle VOC control efficiency determination monitoring, the 12 consecutive monthly VOC control efficiency monitoring periods, and the once per permit term required VOC and HAPs emission factor verification (EFV) performance test on the Advanced Material Recycling System (AMRS) (aka Juno®) EU-144 operated at the Georgia-Pacific Toledo LLC facility located in Toledo, Oregon.

This testing is being conducted to in accordance to the applicable permit operating conditions in the Oregon Department of Environmental Quality Title V Permit No. 21-00005-TV-01. Advanced Industrial Resources, Inc (*AIR*) personnel will perform all elements of the test program. The 30-Batch Cycle test is scheduled for the weeks of **June 5, 2023 and June 12, 2023**, as detailed in Section 11.3 of this protocol. The EFV test is scheduled for the week of **July 10, 2023**. The 12 consecutive monthly VOC control efficiency test schedule begins the week of June 12, 2023, and the test schedule is also presented in Section 11.3.

The facility is located at the following address:

Georgia-Pacific Toledo LLC
1400 SE Butler Bridge Road
Toledo, Oregon 97391

If there are any questions, please do not hesitate to contact us at (800) 224-5007.

Sincerely,
Advanced Industrial Resources

Ross Winne
Technical Director

Derek Stephens
Vice President

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APPENDICES

1.0 INTRODUCTION

Georgia-Pacific Toledo operates a pulp and paper facility located at 1400 SE Butler Bridge Road, Toledo, Oregon 97391. This document represents the protocol for completing the permit required 30-batch cycle VOC control efficiency monitoring tests, 12 consecutive monthly VOC control efficiency monitoring tests, and the once per permit term VOC and HAPs emission factor verification (EFV) performance test on the Advanced Material Recycling System (AMRS; aka Juno©) (EU-144) stack exhaust all in accordance with the facility's Oregon Department of Environmental Quality (ODEQ) issued air quality permit (Permit No. 21-0005-TV).

This Source Test Plan (STP) describes the methods and procedures to be used in conducting the subject emissions monitoring and testing. The protocol was developed using approved United States Environmental Protection Agency (EPA) test methods and in accordance with the requirements of 40 *CFR* Part 60, Appendix A, ODEQ testing guidance, and the facility's Title V permit. This STP is being submitted to DEQ to meet conditions 77.a., 77.b.ii., and 99.a. in the facility's permit.

Advanced Industrial Resources, Inc. (*AIR*) has been contracted by Georgia-Pacific Toledo LLC to perform the aforementioned test programs. AIR will conduct all field sampling work while the HAPs samples collected via NCASI 105.01 will be performed by Enthalpy Labs of Durham, North Carolina. The office headquarters of *AIR* are located at 3407 Novis Pointe NW, Acworth, Georgia, but all correspondence should be directed to P.O. Box 846, Marietta, Georgia 30061. If there are any questions or comments concerning this Site-Specific Test Protocol, please contact Mr. Ross Winne (rwinne@airtest1.com) of *AIR* at 800-224-5007. Mr. Scott Austin (Scott.Austin2@gapac.com) will represent Georgia-Pacific Toledo LLC and can be contacted at 541-336-8318.

Test Team Personnel
Team Leaders: Dan Kirk (primary)
Field Technician: (others TBD)
Lab Technician: Russell Barton

The following statements are required by ODEQ to be included in the Source Test Plan:

- Sampling replicate(s) will not be accepted if separated by a time duration of twenty-four (24) hours or more, unless prior authorization is granted by DEQ.

- All compliance source tests must be performed while the emission unit(s) are operating at normal maximum operating rates. As this is the initial performance test for the AMRS, Permit Condition 99.c. states the operating rate is to be at least 90% of design capacity of the unit. Rates not in agreement with those stipulated in the Title V Permit can result in rejection of the test data. Imposed process limitations could also result from operating at atypical rates during the compliance demonstration.

- The DEQ must be notified of any changes in the source test plan and/or the specified methods prior to testing. Significant changes not acknowledged by the DEQ could be the basis for invalidating a test run and potentially the entire testing program. Documentation of any deviations must include an evaluation of the impact of the deviation on the test data.

- Method-specific quality assurance/quality control (QA/QC) procedures must be performed to ensure that the data is valid for determining source compliance. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information will result in rejection of the data, requiring a retest.

- Only regular operating staff may adjust the combustion system or production process and emission control parameters during the source performance tests and within two (2) hours prior to the tests. Any operating adjustments made during the source performance tests, which are a result of consultation during the tests with source testing personnel, equipment vendors or consultants, may render the source performance test invalid.

- Source test reports must be submitted to DEQ within thirty (30) days of the test dates, unless another deadline has been stipulated, either by permit condition, or by DEQ written approval. (Condition 99.e of the Title V Permit stipulates 60 days)

2.0 SOURCE DESCRIPTION

Georgia-Pacific Toledo operates a pulp and paper facility located at 1400 SE Butler Bridge Road, Toledo, Oregon 97391. The facility produces containerboard products from "brown stock". The facility is comprised of all normal paper industry processes except for the pulp bleaching processes.

The AMRS (EU-144) is operated in a new processing building constructed near the existing #4 boiler and extracts usable cellulose fiber from mixed solid waste streams that include food, paper, plastics, glass, and metals. OCC rejects can be added to the solid waste stream as it enters the process.

All of the raw materials, including OCC rejects, will be collected, baled, and wrapped at an off-site solid waste collection facility. The sealed, plastic wrapped bales will be delivered by truck to the Toledo mill where the raw material will be unloaded and stored outside of the processing building.

The municipal solid waste streams will be staged at predesignated third-party operated transfer stations that are licensed to handle municipal solid waste from commercial and residential sources. The transfer stations have mechanisms in place for both prevention, detection, and removal of hazardous wastes, used oils, asbestos-containing materials, and any other inappropriate solid waste streams. Thus, the AMRS process will not receive or accept hazardous wastes, asbestos-containing materials, or other inappropriate solid waste streams. The DEQ Solid Waste Division approved the Operations Plan for the facility on 10/26/18.

At the mill site, the raw material will be fed into a rotating autoclave which is a steam-pressurized vessel with an internal rotating drum that processes and breaks down the raw materials during the two-hour batch cycle. The system utilizes a proprietary process that sanitizes the feedstock and separates paper fiber from the other commodities inherent in the feedstock stream. Although elevated, the maximum temperature of 270 degrees Fahrenheit in the autoclave is not high enough to decompose wood so the wood fibers in the raw materials or OCC rejects will leave the autoclave as fiber in a slurry form. The design capacity of the AMRS is 50,000 lbs/batch of feedstock.

The fiber recovered from the AMRS will be sent to the existing OCC plant in slurry form and will be further cleaned and refined along with the regular OCC feedstock. The fiber recovered through the AMRS will replace a portion of the OCC wastepaper that is currently brought to and processed in the OCC plant.

Any metals and other residual materials that are not recovered as fiber during the AMRS process will be collected, sorted, and sent to off-site recycling facilities or to an off-site industrial landfill. Any effluent arising from the process will be treated in the company's existing wastewater treatment system.

The overall process emissions are controlled first by packed bed tower scrubber followed by a carbon bed and then vented out of a single stack. The carbon bed also controls the building exhaust. The scrubber operating parameters pressure drop ("W.G.) and scrubber liquid rate (gpm), as well as the carbon absorption filters' pressure drop, will be recorded during each test run for the AMRS.

3.0 TEST PROGRAM SUMMARY

AIR will be conducting a series of VOC removal efficiency monitoring tests as well as an emission factor verification (EFV) performance test to confirm source emissions are as expected from the initial unit's permit application and as established in the facility's permit under the plant site emission limits (PSEL). Testing shall be conducted in accordance with applicable methodologies and test protocols established in 40 CFR 60 Appendix A, ODEQ emissions testing guidance, and the applicable permit conditions established within the facility's Title V permit.

30-consectuive batch cycle monitoring

As previously described, continuous VOC emissions monitoring shall be conducted over 30-consecutvie batch cycles. This testing is to be started within one week of carbon media replacement and will consist of continuously monitoring the unit's common carbon bed absorption system inlet duct and stack exhaust, simultaneously, via EPA Method 25A, in accordance with Permit condition 77.a. As described in Permit condition 77.a, the inlet and outlet volumetric flow rates and moisture contents will be assumed to be the same and therefore the VOC removal efficiency of the carbon bed system will be assessed on a concentration basis only. The VOC emissions will be quantified as total hydrocarbon (THC) on a propane calibration basis. It is further noted that EPA Method 25A quantifies the emissions of THC/VOC on a 'wet' basis and that typically the 'wet' concentrations would be converted to a dry basis for reporting purposes. However, since the inlet and outlet moisture contents will be assumed to be the same, and no EPA Methods 1-4 testing is required, no moisture corrections will be applied for this 30-batch cycle monitoring period and thus the VOC removal efficiency will be assessed using 'wet' emission concentrations only (ppmvw).

12-consective monthly batch cycle tests

Additionally, as required in Permit condition 77.b, monthly monitoring of the carbon absorption filter system's VOC removal efficiency shall be conducted. These monitoring periods shall consist of quantifying the VOC loading to the carbon absorption system as well as the VOC emissions from the unit's stack exhaust over at least a single batch cycle (the start of one batch to the start of the next batch) once per month. The unit's VOC control efficiency will be based on mass rate emissions (lb/hr) and therefore volumetric flow rate, molecular weight, moisture, and VOC emissions, measured as total hydrocarbons (THC) on a propane calibration basis, shall be

conducted at the inlet and/or outlet sampling locations in accordance EPA Methods 1, 2, 3, 3A (outlet only), 4, and 25A.

Emission Factor Verification testing

Finally, as required in Permit condition 93, the once per permit term emission factor verification (EFV) performance test will be conducted to assess the unit's emissions against the applicable PSEL established in the facility's Title V Permit condition 92.a where the annual emission factor for VOCs (as Carbon) is 0.246 pounds per ton of municipal solid waste (lbs/ton MSW). This testing shall consist of quantifying the emissions of VOC (measured as THC on propane calibration basis, converted to as Carbon basis) and HAPs (methanol, formaldehyde, phenol, acetaldehyde, acrolein, and propionaldehyde) at the stack exhaust during three (3) separate batch cycles or as otherwise deemed appropriate. The sampling will be conducted via EPA Methods 1, 2, 3, 3A, 4, 25A, and NCASI 105.01. It is noted that based upon measurements made prior to this EFV test mobilization a determination will be made as to whether the mini-impinger and isokinetic versions of NCASI 105.01 will be utilized. As per the methodology, if the gas stream is saturated with moisture droplets, (i.e. above theoretical moisture carrying capacity) then the isokinetic version must be used. Specific test methods are described in further detail in Section 5.0 of this Test Protocol.

All testing will be conducted while the applicable processes are operating at a target rate of 90% or greater of the designed capacity of 50,000 lbs/batch. During testing, the process will run exclusively on municipal solid waste (MSW) feedstock. GP Toledo will ensure that all essential process monitoring equipment is operating properly and recording data throughout the test period to provide process operating rates necessary to determine process weight-based emission rates, as applicable. At a minimum, the facility will monitor and record during each test run for AMRS EU-144, the scrubber operating parameters pressure drop ("H2O) and scrubber liquid rate (gpm), damper position, as well as the carbon absorption filters' pressure drop, and the operating rate. The number of batches processed since the last carbon media replacement will be recorded during the 12-consective monthly batch cycle tests. This information will be included in the Final Test Report submitted.

4.0 SAMPLING LOCATIONS

The AMRS EU-144 carbon filter stack exhaust is circular and has an internal diameter of 39.0 inches and the sampling ports are located 120" upstream (3.1 equivalent diameters) from the stack exhaust (upstream disturbance), and 240" downstream (6.2 equivalent diameters) from the exhaust fan (downstream disturbance). The exhaust stack is equipped with a minimum of two sampling ports oriented 90 degrees to one another on a parallel plane oriented perpendicular to the exhaust gas flow direction. A maximum of sixteen (16) sampling points (eight traverse points in each of the two cross-sections) will be used for USEPA Methods 2, 3, and 4 sampling, in accordance with USEPA Method 1 requirements. Should it be determined that the mini-impinger version of NCASI 105.01 can be used, the centroid of the sampling location will be used to collect the samples. However, if it is determined that the large impinger isokinetic version is required, then sampling will be conducted from a total of 24 total traverse points (12 in each cross-section).

The AMRS EU-144 carbon filter inlet duct sampling location is circular and has an internal diameter of 39.0 inches and the sampling ports are located at least 0.5 equivalent diameters upstream from the stack exhaust (upstream disturbance), and at least 2.0 diameters downstream from the exhaust fan (downstream disturbance). These measurements will be verified by the test team. The inlet duct is equipped with a minimum of two sampling ports oriented 90 degrees to one another on a parallel plane oriented perpendicular to the exhaust gas flow direction. A maximum of twenty-four (24) sampling points (twelve traverse points in each of the two cross-sections) will be used for USEPA Methods 2, 3, and 4 sampling, in accordance with USEPA Method 1 requirements, as applicable.

Where applicable and in accordance with EPA Method 3A Section 8.1 and Method 25A Section 8.2, the centroidal region of the sampling locations shall be used for O2/CO2 and VOC emission concentration measurements.

5.0 SAMPLING AND ANALYSIS

Source emissions sampling will be conducted at the sampling locations listed in Section 4.0, as applicable, of this Test Protocol in accordance with 40 *CFR* Part 60 Appendix A. Specifically:

- EPA Method 1 will be used for the qualification of the location of sampling ports and for the determination of the number and positions of stack traverse points, as applicable to sample traverses for Method 2.

- EPA Method 2 will be employed for the determination of the stack gas velocity and volumetric flow rate during stack sampling using the Type "S" Pitot tube.

- EPA Method 3 and 3A will be used for the determination of molecular weight and oxygen and carbon dioxide concentration determinations.

- EPA Method 4 will be used for the direct determination of moisture content with 3 batch-length test runs of about 120-150 minutes each. ODEQ Method 4 (ODEQ4) will be used as the 2nd method for determining the moisture content of the stack gas. Specifically, ODEQ4 Equations 4.4-1 and 4.4-2 will be used to calculate the theoretical maximum moisture content of the stack gas. The lower of these two values (actual vs. theoretical) will be used for calculating dry standard volumetric flow rates (dscfm) and correcting total hydrocarbon (THC) emission concentrations to a dry basis when applicable.

- EPA Method 25A will be used for the determination of volatile organic compounds (VOCs), measured as total hydrocarbons (THC) on a propane calibration basis and corrected to an as Carbon basis when applicable.

- NCASI Method 105.01 will be used to quantify the HAPS emissions including methanol, formaldehyde, phenol, acetaldehyde, acrolein, and propionaldehyde. To ensure QA/QC, a 2nd identical sample train operated as duplicate and spiked test runs will utilized, as required by the method . Unless otherwise directed, the sample run will be conducted from batch-length durations.

- EPA Method 205 may be used for the verification of calibration gas accuracy when utilizing a gas mixing (dilution) system.

The procedure detailed in Section 11.4 of EPA Method 1 shall be used to verify the absence of cyclonic flow. Data for the verification of the absence of cyclonic flow will be included in the final report.

As applicable, samples will be recovered on site in a controlled environment and stored at the appropriate temperature in polypropylene or glass storage containers, as applicable to the method. The liquid level will be marked to verify no liquid was lost during transport. All samples will be stored upright in a closed sample box until final laboratory analysis. In order to limit the chain of custody, only essential *AIR* personnel are permitted access to these samples. All samples will be analyzed within fifteen (15) days of the completion of the field testing.

Sample analysis of the gaseous parameters will be performed on site by *AIR* during the test program. Any deviations from the Source Test Plan will be thoroughly discussed with ODEQ for approval and described in the final report.

6.0 DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) process is generally a seven-step iterative planning approach to ensure development of sampling designs for data collection activities that support decision making. The seven steps are as follows: (1) defining the problem; (2) stating decisions and alternative actions; (3) identifying inputs into the decision; (4) defining the study boundaries; (5) defining statistical parameters, specifying action levels, and developing action logic; (6) specifying acceptable error limits; and (7) selecting resource-effective sampling and analysis plan to meet the performance criteria. The first five steps are primarily focused on identifying qualitative criteria such as the type of data needed and defining how the data will be used. The sixth step defines quantitative criteria, and the seventh step is used to develop a data collection design. In regards to emissions sampling, these steps have already been identified for typical monitoring parameters.

Monitoring methods presented in 40 *CFR* Part 60 Appendix A indicate the following regarding DQOs: Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods. At a minimum, each method provides the following types of information: summary of method; equipment and supplies; reagents and standards; sample collection, preservation, storage, and transportation; quality control; calibration and standardization; analytical procedures, data analysis and calculations; and alternative procedures. These test methods have been designed and tested according to DQOs for emissions testing and analysis. These test methods have been specified and will be followed in accordance with this Site-Specific Test Protocol, which will ensure that DQOs are met for this project.

7.0 INTERNAL QUALITY ASSURANCE PROGRAM

The quality assurance/quality control (QA/QC) measures associated with the sampling and analysis procedures given in the noted EPA reference methodologies, in Subparts A of 40 *CFR* Part 60 and 40 *CFR* Part 63, and in the *EPA QA/QC Handbook*, Volume III (EPA 600/R-94/038c) will be employed, as applicable. Such measures include, but are not limited to, the procedures detailed below.

7.1 SAMPLING TRAIN LEAK CHECKS

Determinations of the leakage rate of the sampling train are made before and after each sampling run using the procedure detailed in Section 8.4.2 of EPA Method 5. Before the sampling run, after the sampling train has been assembled and probe and filter box temperatures have had time enough to settle at their appropriate operating values, the probe nozzle will be plugged and the system will be evacuated to a pressure of 15 inches of Hg below ambient pressure. The volumetric leakage rate will be measured by the dry gas meter over the course of one (1) minute. If the leakage rate is less than 0.020 cfm, then the test proceeds. After the sampling run, before the train is disassembled the probe nozzle will be plugged and the system will be depressurized to a vacuum equal to or greater than the maximum value reached during the sampling run. The volumetric leakage rate will be measured by the dry gas meter over the course of one (1) minute. If the leakage rate is less than 0.020 cfm, then the test run will be considered valid. If a component change must be made during the test run, a leak check will be conducted immediately before and after the component change is made using the procedure outlined above.

The Type "S" Pitot tube assembly will also be checked for leaks before and after sampling runs using the procedure in Section 8.1 of EPA Method 2. The impact opening of the Pitot tube will be blown through until a pressure of at least 3 inches of water registers on the manometer. The impact opening will quickly be plugged and held for at least 15 seconds, during which time the manometer reading must hold. The same operation will be performed on the static pressure side of the Pitot tube, except suction will be used to obtain the pressure differential.

7.2 PROBE NOZZLE DIAMETER CHECKS

Probe nozzles will be calibrated before each field use by measuring the internal diameter of the nozzle entrance orifice along three different diameters. Each diameter is measured to the nearest 0.001 inch, and all measurements will be averaged. If the total variation of the three

measurements exceeds 0.004 inch, the nozzle shall be reshaped, sharpened, and recalibrated before further use.

7.3 PITOT TUBE FACE PLANE ALIGNMENT CHECK

Before field use, each Type S Pitot tube is examined in order to verify that the face planes of the tube are properly aligned, per Method 2 of 40 *CFR* Part 60, Appendix A. The external tubing diameter and base-to-face plane distances are measured in order to verify the use of 0.84 as the baseline (isolated) pitot coefficient. At this time the entire probe assembly (i.e., the sampling probe, nozzle, thermocouple, and Pitot tube) is inspected in order to verify that its components meet the interference-free alignment specifications given in EPA Method 2. If the specifications are met, then the baseline pitot coefficient is used for the entire probe assembly.

After each field use, the face plane alignment of each Pitot tube is checked. If any damage has occurred to the tube orifices, the tube will be reshaped, realigned, and recalibrated before further use.

7.4 METERING SYSTEM CALIBRATION

Annually each dry gas meter (DGM) console is calibrated at five orifice settings according to Method 5 of 40 *CFR* Part 60, Appendix A. From the calibration data, calculations of the values of Y_m and $\Delta H_@$ are made, and an average of each set of values is obtained. The limit of total variation of Y_m values is $\pm$0.02, and the limit for $\Delta H_@$ values is $\pm$0.20.

After each field use, the calibration of the DGM console is checked by performing three calibration runs at a single intermediate orifice setting that is representative of the range used during field testing. The limit of acceptable relative variation from Y_m is 5.0%.

7.5 TEMPERATURE GAUGE CALIBRATION

After each field use, the temperature measuring instruments on each sampling train are calibrated against standardized mercury-in-glass reference thermometers. The limit of acceptable variation between the absolute reference temperature and the absolute indicated temperature is 1.5%.

7.6 BAROMETRIC PRESSURE DATA ACQUISITION

The barometric pressure at the test site is measured by contacting the National Weather Service prior to and immediately following the testing. Reported barometric pressure will be adjusted for actual elevation at the test site.

7.7 SAMPLE HANDLING AND CHAIN OF CUSTODY PROCEDURES

All samples are transported in a closed sample box, the security of which is the responsibility of the Field Test Director. These samples are received, checked, and numbered by the Test Director and custody records are written. The QA Director then again checks the integrity of the samples and their identifications.

For samples that require off-site analysis, the samples collected during the emissions testing program will be placed in shipping coolers with sufficient insulation to prevent breakage during shipping. All samples in a shipping container will be listed on the chain-of-custody form enclosed in the shipping container. Once the samples are securely packaged, the container will be sealed with tape and several custody seals will be placed over the top edge so that the container cannot be opened without breaking the custody seal.

7.8 DATA REDUCTION CHECKS

The Report Preparation Director will run an independent check (using a validated computer program) of the calculations with predetermined data before the field test. The Test Director will conduct spot checks on-site to assure that data are being recorded accurately. After the test, the Report Preparation Director will check the data input to assure that the raw data have been transferred to the computer accurately. Isokinetic sampling rates will be checked to ensure rates were 100% $\pm$ 10%. Volumetric flow rates, temperatures and moisture contents will be compared to test results from previous sampling events, if available, to identify potential inconsistencies in test data.

7.9 GAS ANALYZER CALIBRATION

7.9.1 Calibration Gas Concentration Verification Calibration gases that are analyzed following the Environmental Protection Agency Traceability Protocol No. 1 will be used. Certification from the gas manufacturer that Protocol No. 1 was followed will be obtained.

7.9.2 Measurement System Preparation *AIR* will assemble each measurement system by following the manufacturer's written instructions for preparing and preconditioning each gas analyzer and, as applicable, the other system components. *AIR* will make all necessary adjustments to calibrate the analyzers and the data recorders.

7.9.3 Analyzer Calibration Error Test *AIR* will conduct the analyzer calibration error check by introducing calibration gases to the measurement system upstream of each gas analyzer. After the measurement system has been prepared for use and immediately prior to starting the test run, *AIR* will introduce the zero and high-level (80-90% of applicable span value) calibration gases to calibrate the analyzer to establish calibration curve. Then, sequentially, the low- and mid-range gases will be introduced into the analyzer and their responses recorded to determine the differences between the measurement system responses and the predicted responses. These differences must be less than 5% of the respective calibration gas values. If not, the measurement system is not acceptable and must be repaired or replaced prior to testing. During this check, *AIR* will make no adjustments to the system except those necessary to achieve the correct calibration gas flow rate at the analyzer.

7.9.4 Drift Determinations At the end of each test run or whenever adjustments are necessary for the measurement system, *AIR* will reintroduce the zero and mid-level calibration gases, one at a time, to the measurement system at the calibration valve assembly. No adjustments are to be made to the measurement system until both the zero and calibration drift checks are made. If the respective drift values exceed ±3% of the span, the test run is invalidated and the system must be repaired or replaced and the calibration error test described in the above section must be repeated before successive tests can be conducted.

7.9.5 Analyzer Calibration Error and Drift Check Specifications Analyzer calibration error shall be less than ±5 percent of the calibration gas value. Zero and calibration drifts shall be less than ±3 percent of the span value.

7.10 INSTRUMENT RESPONSE TIME

After the analyzer has been initially calibrated and the Calibration Error Test has been completed, *AIR* will introduce the zero calibration gas into the measurement system at the calibration valve assembly. When the system response has stabilized, the high-level calibration gas will be quickly introduced at the calibration valve assembly. The time will be recorded for

the system response output to stabilize at a value that is 95 percent of the certified calibration gas value. *AIR* will then switch back to the zero calibration gas and allow the system response to return to zero. The above procedure will be repeated three (3) times and the response times will be averaged and will be considered the system response time.

8.0 EXTERNAL QUALITY ASSURANCE PROGRAM

8.1 AUDIT SAMPLE PROCEDURES

There are currently no audit samples available for this testing program.

8.2 SITE-SPECIFIC TEST PLAN EVALUATION

In submitting this Source Test Plan in advance of testing, Oregon DEQ personnel have been afforded the opportunity to review and comment upon the test and quality assurance procedures to be used in conducting this Source Test Plan.

8.3 ON-SITE TEST EVALUATION

In submitting the schedule in Section 11.3 of this Source Test Plan, ODEQ personnel have been afforded the opportunity for on-site evaluation of all test procedures. *AIR* will provide all regulatory personnel complete access to all activities during the execution of this Source Test Plan to ensure transparency of the process.

9.0 REPORTING AND DATA REDUCTION REQUIREMENTS

Upon completion of field testing activities, *AIR* will reduce the collected data and prepare a Final Test Report.

Appendix A of this Site-Specific Test Protocol includes an example outline of the Final Test Report and a brief explanation of points. The report will summarize in tabular form the results of all tests and will include all data sheets and calculations necessary to confirm whether the various emission limits were achieved. Appendix B includes example calculations and the related nomenclature for the data reduction. The Final Test Report will be submitted to ODEQ within 60 days completing the field testing portion of the program in accordance with Oregon Title-V Operating Permit #21-0005-TV-01, Condition 77.a. and 99.e.

10.0 PLANT ENTRY AND SAFETY

10.1 SAFETY RESPONSIBILITIES

The Test Director is responsible for ensuring compliance with plant entry, health, and safety requirements. The Facility Contact has the authority to impose or waive facility restrictions.

10.2 SAFETY PROGRAM

AIR has a comprehensive health and safety program that satisfies Federal OSHA requirements. The basic elements include: (1) written policies and procedures, (2) routine training of employees and supervisors, (3) medical monitoring, (4) use of personal protection equipment, (5) hazard communication, (6) pre-mobilization meetings with GP Toledo personnel, and (7) routine surveillance of the on-going test work.

10.3 SAFETY REQUIREMENTS

During the pretest inspection, *AIR* will ensure all sampling locations on the inlet ducts and exhaust stacks are easily accessible by scaffolding, hydraulic lift or permanent platform. There is little risk of exposure to harmful amounts of toxic materials at the sampling locations. However, test personnel will be instructed to minimize their exposure to exhaust gases.

All test personnel will adhere to the following standard safety and precautionary measures as follows:

- Confine selves to test area only.
- Wear hard hats at all times on-site, except inside the equipment resource vehicle
- Wear steel-toed shoes or boots, protective shatter-resistant glasses or goggles, and hearing protection as appropriate at the test site
- Know the locations of readily available first aid equipment and fire extinguishers
- Be familiar with Emergency Response Procedures at the facility, including evacuation signals and procedures.

11.0 PERSONNEL RESPONSIBILITIES AND TEST SCHEDULE

11.1 TEST SITE ORGANIZATION

The key tasks and task leaders are:

Facility Contact:	Jen Wagner
Program Director:	Scott Wilson
Test Director:	Dan Kirk
Technical Director:	Ross Winne
VP/QA Director:	Derek Stephens
Report Preparation Director:	Steven Haigh
Operations/Safety Director:	John Hendry

11.2 TEST PREPARATIONS

11.2.1 Construction of Special Sampling and Analytical Equipment. There are no equipment modifications or special analytical equipment required for this site.

11.2.2 Modifications to Facility. No modifications are necessary to the facility in order to accommodate this testing.

11.2.3 Services Provided by Facility. *AIR* will be providing all services to GP Toledo.

11.2.4 Access to Sampling Sites. During a pretest inspection, *AIR* will ensure the sampling location is easily accessible by scaffolding, hydraulic lift or permanent platform. GP Toledo will be notified of any inadequacies and these will be addressed prior to conducting the tests.

11.3 TEST PERSONNEL RESPONSIBILITIES AND SCHEDULE

AIR personnel will arrive at the plant about 1.5 hours before the start of the first test run on each of the days scheduled for sampling. Pre-test activities on these days will include the following:

The Test Director, QA Director and other *AIR* personnel will:

- Meet with the Facility Contact to review the daily test objectives

- Prepare and set-up (including leak checks) the sampling trains and analyzers
- Calibrate instrumental analyzers
- Verify communication links between team members/leaders/plant personnel

The Facility Contact will:

- Verify that the proper and adequate feed materials specified in this Plan for the various emission sources are available and that the facility will be capable of operating under the specified feed rate conditions for the entire test duration.
- Verify that all process monitors and recording devices are operating properly

AIR personnel will travel to the site, establish test team/facility operator communications and set up equipment at the sampling location test locations at least several hours prior to the beginning of the test program. The compliance test program is scheduled to take place as follows:

Week of 6/5/23

- Method 25A for VOC concentration @ inlet/outlet of Carbon Beds – 30 batch cycles

Week of 6/12/23

- Method 25A for VOC concentration @ inlet/outlet of Carbon Beds - 30 batch cycles (continuation)
- Method 25A for VOC concentration @ inlet/outlet of Carbon Beds & Methods 1-4 inlet or outlet for air flow (1st of series of 12 monthly tests)

Week of 7/10/23

- Second monthly test - Method 25A for VOC concentration @ inlet/outlet of Carbon Beds & Methods 1-4 inlet or outlet for air flow
- Emission Verification Test – Stack exhaust – Methods 1-4, 25A, 105.01 – 3 batch cycles

Monthly tests 3-12 for Method 25A for VOC concentration @ inlet/outlet of Carbon Beds & Methods 1-4 inlet or outlet for air flow to be conducted during 1st week of month, except for January 2024. Monthly tests may need to be reschedule depending on Toledo Mill and/or AMRS Plant operational availability.

APPENDIX A

EXAMPLE OUTLINE OF THE FINAL TEST REPORT

EXAMPLE OUTLINE OF THE FINAL TEST REPORT

1.0 Introduction

- Summary of Test Program
- Key Personnel

2.0 Plant, Process, and Sampling Location Descriptions

- Process and Operation Descriptions
- Sampling Locations

3.0 Summary and Discussion of Test Results

- Objectives
- Field Test Changes and Problems
- Presentation of Test Results
- Process Monitoring

4.0 Sampling and Analytical Procedures

5.0 Quality Assurance Activities

- Internal Quality Assurance (equipment, methodology, etc.)
- External Quality Assurance (SSTP and on-site evaluation)

6.0 Data Quality Objectives

Appendices

Appendix A	Test Results
Appendix B	Field Data Reduction
Appendix C	Example Calculations and Nomenclature
Appendix D	Raw Field Data
Appendix E	Laboratory Analytical Reports
Appendix F	Facility Process Monitoring Data

APPENDIX B

EXAMPLE CALCULATIONS AND NOMENCLATURE

EXAMPLE CALCULATIONS

$A_n = D_n^2 \pi / 4$

$A_s = D_s^2 \pi / 4$

$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$

$c_{PM} = (m_{PM} / V_{m(std)})$ (35.31466 ft^3/m^3)

‘$c_{PM} = (m_{PM} / V_{m(std)})$ (0.015432 gr/mg)

$E_{PM} = (m_{PM} / V_{m(std)}) Q_{sd}$ (60 min/hr) (2.2046×10^{-6} lb./mg)

‘$E_{PM} = E_{PM} / P$

$I = 100 T_s (K_3 M_{lc} + Y_m V_m P_m / T_m) / (60 \theta v_s P_s A_n)$

where $K_3 = 0.002668$ (in. Hg ft^3) / (mL °R)

$K_I = [(2.0084 \times 10^7 \Delta H_@) A_n (1 - B_{ws})]^2 (M_d / M_s) (T_m / T_s) (P_s / P_m)$

$M_d = 0.44$ (% CO_2) + 0.32 (% O_2) + 0.28 (% N_2 + % CO)

$M_s = M_d (1 - B_{ws}) + M_w B_{ws}$

$P_m = P_{bar} + \Delta H / 13.6$

$P_s = P_{bar} + p_g / 13.6$

$Q_a = (60$ s/min) $v_s A_s$

$Q_{sd} = (60$ s/min) $(1 - B_{ws}) v_s A_s (T_{std} / T_s) (P_s / P_{std})$

$T_m = t_m + 460°$

$T_s = t_s + 460°$

$V_{m(std)} = 17.636 V_m Y_m P_m / T_m$

$V_{w(std)} = M_{lc}$ 0.04716

$v_s = K_p C_p [\Delta p]^{1/2} [T_s / (P_s M_s)]^{1/2}$

NOMENCLATURE

Symbol	Units	Description
A_n	ft^2	Area of the nozzle
A_s	ft^2	Area of the stack
B_{ws}	dimensionless	Volume proportion of water in the stack gas stream
C_p	dimensionless	Type S pitot tube coefficient
c_{PM}	mg/dscm	Concentration of PM in dry stack gas, standardized
$'c_{PM}$	gr./dscf	Concentration of PM in dry stack gas, standardized
D_n	inches	Internal diameter of the nozzle at the entrance orifice
D_s	inches	Internal diameter of the stack at sampling location
DH	inches H_2O	Average pressure differential across the meter orifice
DH@	inches H_2O	Orifice pressure differential that corresponds to 0.75 cfm of air at 68 °F and 29.92 inches of Hg
Dp	inches H_2O	Velocity head of stack gas
E_{PM}	lb./hour	Emission rate of PM, time basis
$'E_{PM}$	kg/Mg	Emission rate of PM, production basis
I	percent	Isokinetic sampling ratio expressed as percentage
K_I	dimensionless	K-factor, ratio of DH to DP, ideal
K_p	$ft[(lb/lb\text{-}mol)(in.\ Hg)]^{1/2}$	Type S pitot tube constant,
	$s[(°R)(in.\ H_2O)]^{1/2}$	= 85.49
L_p	cfm	Measured post-test leakage rate of the sampling train
M_d	lb./lb.-mole	Molecular weight of gas at the DGM

Symbol	Units	Description
M_s	lb./lb.-mole	Molecular weight of gas at the stack
M_w	lb./lb.-mole	Molecular weight of water,
		= 18.0
m_{PM}	mg	Mass of PM in the sample
n	dimensionless	Number of data points
P_{bar}	inches Hg	Barometric pressure at measurement site
P_{input}	tons/hour	Process dry mass input rate
p_g	inches H_2O	Gauge (static) pressure of stack gas
P_m	inches Hg	Absolute pressure of meter gases
P_s	inches Hg	Absolute pressure of stack gases
P_{std}	inches Hg	Standard absolute pressure
		= 29.92
Q_a	cfm	Volumetric flow rate of actual stack gas
Q_{sd}	dscfm	Volumetric flow rate of dry stack gas, standardized
R	(in. Hg)(ft^3)	Ideal gas constant,
	(lb-mole)(°R)	= 21.85
r_w	lb/mL	Density of water,
		= 0.002201
r_a	g/mL	Density of acetone,
		= 0.7899
S_d	dimensionless	Standard deviation
T_m	°R	Absolute temperature of dry gas meter
T_s	°R	Absolute temperature of stack gas
T_{std}	°R	Standard absolute temperature,
		= 528
t_m	°F	Temperature of DGM
t_s	°F	Temperature of stack gas
q	minutes	Total sampling time

Symbol	Units	Description
M_{lc}	g	Total mass of liquid collected
V_m	dcf	Volume of gas sample as measured by the DGM
$V_{m(std)}$	dscf	Volume of gas sample as measured by the DGM, standardized
$V_{w(std)}$	scf	Volume of water vapor in the gas sample, standardized
v_s	ft./sec	Velocity of stack gas
Y_m	dimensionless	DGM calibration coefficient
Y_c	dimensionless	DGM calibration check value
Y_w	dimensionless	Reference (wet) gas meter calibration coefficient
% CO_2	percent	Percent CO_2 by volume, dry basis
% O_2	percent	Percent O_2 by volume, dry basis
% N_2	percent	Percent N_2 by volume, dry basis

Oregon
Tina Kotek, Governor

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Georgia-Pacific Toledo LLC
Title V Permit 21-0005-TV-01
2023 – Advanced Material Recycling System
Source Test Plan – Emission Factor Verification
REVISED

Ms. Wagner and Mr. Winne:

The source test plan received on May 4, 2023, and the email received on May 31, 2023, for source testing at the Georgia-Pacific facility located in Toledo has been reviewed. The source test plan is for source testing the emissions from the new Advanced Material Recycling System (AMRS).

DEQ understands that the following testing is proposed.

- VOC (THC as propane) emissions at the AMRS scrubber / carbon adsorption system outlet.
- Methanol, formaldehyde, phenol, acetaldehyde, acrolein and propionaldehyde emissions from the AMRS scrubber / carbon adsorption system outlet.
- The Total VOC emissions shall be determined using the Oregon DEQ IMD for Wood Products. https://www.oregon.gov/deq/Filtered%20Library/IMDevalVOC.pdf

The results of these tests will be used to verify emission factors. The test plan is approved with the following conditions:

GENERAL PROCESS CONDITIONS

1. Only regular operating staff may adjust the production process and emission control parameters during the source performance tests and within two (2) hours prior to the tests. Any operating adjustments made during the source performance tests, which are a result of consultation during the tests with source testing personnel, equipment vendors or consultants, may render the source performance test invalid.

2. The DEQ must be notified of any changes in the source test plan and/or the specified methods prior to testing. Significant changes not acknowledged by the DEQ could be the basis for invalidating a test run and potentially the entire testing program. Documentation of any deviations must include an evaluation of the impact of the deviation on the test data.

3. Method-specific quality assurance/quality control (QA/QC) procedures must be performed to ensure that the data is valid for determining source compliance. This must be done whether or not DEQ representatives are on-site to observe the testing and whether or not a QA/QC requirement has been specifically acknowledged and approved by DEQ. Only method-specific requirements explicitly exempted by the EPA and/or DEQ need not be performed. Documentation of the procedures and results shall be presented in the source test report for review. Omission of this critical information will result in rejection of the data, requiring a retest.

4. It is acceptable to postpone a scheduled test or suspend a test in progress if the discontinuation is due to equipment failure beyond the facility's control, construction delays beyond the facility's control, severe meteorological conditions, and situations that would jeopardize the safety of the testing contractors and/or operators. If the test is underway, the permittee should make every effort to complete the test run. All recoverable test information (process & sample data) must be available for DEQ review.

   It is unacceptable to postpone or suspend a test run in progress if it is discontinued because the source is not able to comply with an emission limit, verify an existing emission factor, or comply with a control equipment performance standard. The permittee must provide DEQ written documentation explaining the reasons for the postponement or stoppage, and any data collected prior to the stoppage. DEQ will review the documentation and all available stack test data to determine if a violation occurred.

5. Unless otherwise specified in the Permit, source testing shall be performed as follows: When verifying or determining an emission factor, the stack test must generate an emission factor that represents normal emissions for the operating condition tested.

6. A test run will start when material is beginning to be added to the autoclave and ends when the next batch of material is starting to be added to the autoclave. This testing consists of at least three batch cycles. You may need to skip a batch, in order to give AIR the time to calibrate their instruments between source test runs.

7. **Source testing shall be performed while the AMRS is processing feedstock that is representative of normal operations.**

8. Include a copy of the running annotated 1-minute test van DAS log that starts with initial calibrations and ends at the conclusion of the test day. It should include all calibrations, stratification checks, and test runs. Include all DAS and lab book entries and lab data in the hardcopy bound and PDF test report.

9. During source testing, the following process parameters shall be determined, recorded, and documented in the source test report. The process parameters below are to be reported for each individual test run and averaged for all test runs as appropriate.
   - Scrubber pressure drop (inches of water column)
   - Scrubber liquid blowdown rate (gpm) - Estimated
   - Scrubber liquid recirculation flow rate (gpm)
   - Mill water flow rate (gpm)
   - Carbon Adsorption filter pressure drop (inches of water column) – Hourly Readings
   - Exhaust air blower inlet damper measurement, Hourly Readings
   - Pre-Vac Ejector Supply Valve Position (0 or 1)
   - Post-Vac After Condenser Vent Pressure Control Valve (percent)
   - AMRS pressure (psi) – maximum
   - AMRS temperature (F) - maximum

- Material processed – Normal Representative Conditions – OCC / MSW ratio if possible.
- Weight of material processed during each Batch Cycle.
- Number of Batches processed since the last carbon media replacement.
- Production rate (tons per batch, tons per test run)
- Start and End Time for each batch processed during the source test.

EPA/ODEQ METHODS 1-4 CONDITIONS

10. **Using EPA Method 2, Section 8.6 is acceptable - For processes emitting essentially air, an analysis need not be conducted; use a dry molecular weight of 29.0.**

11. If you use Method 3A, the sampling system must be leak-checked before and after the testing program (before the first run and after the last run). Results of the leak check are to be documented within the test report.

12. For compliance source testing, the flow rate for the outlet stack must meet the EPA Methods 1 & 2 criteria. Clear diagrams and documentation of this must be included in the source test report.

13. The outlet stack must be checked for cyclonic flow. Documentation of this must be provided in the test report.

14. **The outlet flow rate must be measured for the duration of each batch cycle using EPA Methods 1-4.**

15. The moisture content of the outlet stack gas must be determined by Oregon DEQ Method 4 or by EPA Method 4 for each test run. In addition, Section 12.1.7 of EPA Method 4 states “In saturated or moisture droplet-laden gas streams, two calculations of the moisture content of the stack gas shall be made, one using a value based upon the saturated conditions (alternate method) and one based upon the results of the impinger analysis (EPA Method 4). If this is the case, then ODEQ Method 4 (wet bulb/dry bulb) shall be used as the alternative method. At minimum, two measurements of moisture content (Bws) using ODEQ Method 4 shall be made for each run and averaged for the run. The lower of the two values of Bws as determined by EPA Method 4 and ODEQ Method 4 shall be considered correct for each run.

16. For Oregon DEQ Method 4 in saturated stacks, the wet bulb temperature equals the dry bulb temperature. Use the dry bulb temperature for both readings.

EPA METHOD 25A CONDITIONS

17. Each Method 25A sampling system must be leak-checked before and after the testing program (before the first run and after the last run). The results of each leak check must be reported in the test report.

18. The span of the analyzer used to perform EPA Method 25A should be equivalent to 1.5 to 2.5 times the expected concentration. AIR should attempt to choose an outlet span that will keep all test run measurements on scale, without choosing an overly high span.

    During the previous source test, the outlet concentrations were greater than 29 ppmvw as propane at some times.

    The analyzer span should be chosen so that all FID readings are less than the span for their respective channels.

19. The calibration gases must be Propane in Air or in Nitrogen.

20. Include a copy of the running annotated 1-minute DAS log that starts with initial calibrations and ends at the end of the test day. It should include all calibrations, stratification checks, and test runs.

21. The DAS logs and calibration data need to be labeled THC as propane, to clarify the calibration gas used.

22. Results may <u>not</u> be drift corrected.

23. If the calibration drift is more than 3% of the span value, the run must be repeated.

24. Moisture content of the outlet stack gas must be determined by EPA Method 4 for each test run, to correct the wet ppmv values from Method 25A.

25. VOC (THC) as propane emissions must be reported as indicated below for each individual test run and averaged for all three test runs.

    Results should be on a propane or carbon basis and be shown with and without the inclusion of methanol, formaldehyde, phenol, propionaldehyde, acetaldehyde and acrolein following DEQ Guidance Document P-820-100. Hand calculations must be provided for at least one test run.

    - ppmvw as propane
    - ppmvd as propane
    - ppmvd as carbon
    - lb/hr propane basis
    - lb/hr carbon basis
    - lb/ton MSW

NCASI METHOD A.105.01 CONDITIONS

26. During sampling, equipment associated with isokinetic sampling will not share a test port with other sampling equipment.

27. Ensure sufficient o-benzylhydroxylamine (BHA) is available to derivatize the aldehydes collected during the test.

28. Since entrained water droplets are expected, be prepared for isokinetic sampling.

29. Ensure all quality assurance procedures summarized in the method's appendix, on page A1, are followed.

30. The sampling rate must be constant during testing.

31. Collected samples must be maintained at approximately 4^{o}C until analysis of the samples is completed.

32. Include a full lab data package in the test report.

33. Emission of methanol, formaldehyde, phenol, propionaldehyde, acetaldehyde and acrolein must be reported individually and totaled as follows for each test run and averaged for all three test runs. Complete hand calculations must be provided for at least one test run.

    - ppmvd
    - lb/hr

EPA METHOD 205 CONDITIONS

34. If a gas dilution system is to be used to provide calibration gases for other source test methods, then the system shall be evaluated once during the source test in accordance with the requirements of EPA Method 205.

35. **The Method 205 evaluation must be performed using the Method 25A FID instrument using propane calibration gas.**

GENERAL TESTING CONDITIONS

36. The Certification Form (only) of the Source Test Audit Reports (STAR) shall be completed and submitted with the Source Test Report. The Certification Form can either be bound in the report or it can be submitted separately. Submittal of the method-specific STAR reports is no longer required. Copies of all of the STAR forms are available electronically.

37. Test reports are due within 60 days of completion of each testing campaign.

38. Submit a searchable electronic PDF copy of the report, in addition to the hard copy. Email limits are 20 MB per attachment. If the report is larger than that, please send a copy on a thumb drive. We no longer have a CD Drive.

39. In an attempt to conserve natural resources and to minimize storage space requirements, the test report should be printed on both sides of each page within the document. The DEQ recognizes this may not be feasible for some supporting documentation.

DEQ understands that testing is to be conducted the week of July 10, 2023. Please let me know if there are any changes to the testing schedule.

If you have any questions or concerns, please contact me at 503-508-1989.

Sincerely,

Suzanne Blackburn
Source Test Coordinator
Environmental Engineer
DEQ Salem Office

cc: Mike Eisele, DEQ: AQ File

APPENDIX I

S.T.A.R. FORMS

SOURCE TESTING AUDIT REPORT: CERTIFICATION FORM

Facility: Georgia-Pacific Toledo LLC **Permit #:**21-0005-TV-01 **Test Date:** July 12, 2023
Emission Unit: ADVANCED MATERIAL RECYCLING SYSTEM (AMRS) (EU-144) **Sampling Location:** Toledo, Oregon

SECTION 1: TESTING PROGRAM CERTIFICATION INFORMATION

ITEM OF INQUIRY	Yes	No	EXPLANATION
A. Is the purpose(s) for the testing clearly defined within the test report?	X		
B. Did testing include all pollutants specified within the Source Test Plan (STP)?	X		
C. Were all issues within the Department's response to the STP fully addressed?	X		
D. Was the source operating within ±10% of normal maximum capacity?	X		
E. Are all appropriate operating conditions documented?	X		
F. Were there any test interruptions?		X	
G. Were there any variances or modifications to the STP? (if Yes; reply to i & ii)		X	
i. Were the variances or modifications approved by the Department?			
ii. Does the report include an evaluation of the impact the variances or modifications had on the test data?			

SECTION 2: SOURCE SAMPLING REPORT AUDITOR CERTIFICATION:

I hereby certify that to the best of my knowledge, the information provided within this source sampling audit report is complete and factual.

Name: Ross Winne Title: Technical Director

Signature: Ross G. Winne Date: September 8, 2023

SECTION 3: PERMITTEE REPRESENTATIVE CERTIFICATION:

I hereby certify that to the best of my knowledge, the information provided within this source sampling audit report is complete and factual.

Name: _____ Title: _____

Signature: _____ Date: _____

SECTION 4: DEPARTMENT REPRESENTATIVE:

The Oregon Department of Environmental Quality has evaluated the Source Sampling Audit Report and has determined that the information provided is sufficient for accepting the results originating from the testing program. Although no deficiencies were exposed by the Source Sampling Audit Report, additional errors and/or inconsistencies may be detected through additional Departmental review at a later date, which may lead to a retest or an enforcement action against the permittee.

Name: _____ Title: _____

Signature: _____ Date: _____