Quarterly Report for Goodrich Corporation Fenceline Monitoring Plan-Q2 2025

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MONTROSE AIR QUALITY SERVICES

Table of Contents

Table of Figures

Table of Tables

I. Goodrich Corporation Fenceline Monitoring Plan Quarterly Report- Q3 2024

II. Executive Summary

This report summarizes the findings related to the Goodrich Corporation fenceline monitoring plan during the period of April 1st of 2025 to June 30th of 2025 (Q2 of 2025). The data collected during this period were validated following all procedures described in the Goodrich Corporation fenceline monitoring plan. This report includes tables with the validated and invalidated data, statistical analysis results and timeseries of the compounds of interest and meteorological parameters.

III. Contact Information

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IV. Methods

A. Site Description

Goodrich operates an aircraft brakes manufacturing facility at 50 William White Blvd, Pueblo, CO 81001. The carbon brake manufacturing process is a series of seven operational steps: The textile of preforms, carbonization of preforms, chemical vapor deposition (CVD) of preforms, intermediate machining of preforms, an additional CVD cycle, final dimensional machining, and final assembly.

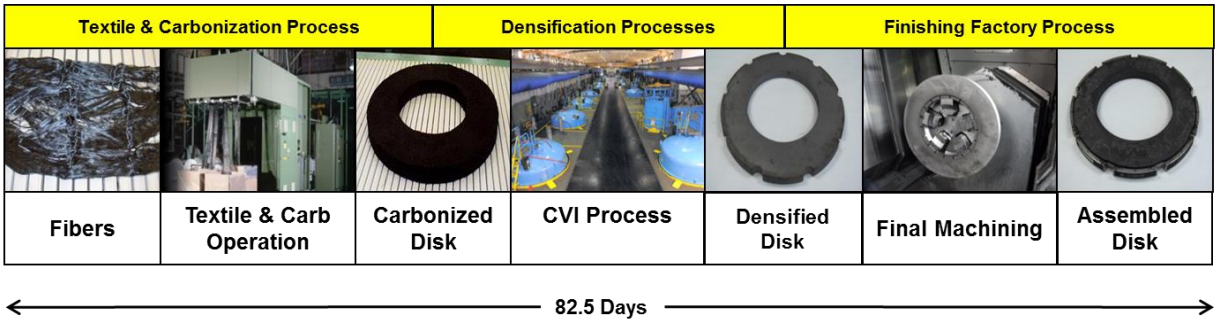

Figure 1. The Goodrich Carbon Brake Manufacturing Process

These specific processes can be more generally separated into four manufacturing areas; textile, furnace operations, machining, and finishing. The textile process transforms raw polyacrlyonitrile (PAN) fibers into a three-dimensional matrix or brake preform. Brake preforms are then batch processed in high-temperature, low-pressure reactors (furnaces). The two major processes completed are carbonization and densification. Carbonization converts the raw PAN preforms to a carbon fiber preform and removes impurities. The densification process cracks a feed hydrocarbon stream to infiltrate and sequester molecular carbon on the carbon fiber preform. The machining of preforms is completed at two stages; once in the middle of the densification and once following densification. After the final machining operations, the

final assembly operations include application of an oxidation protection system and hardware installation. Additionally, the carbon brake manufacturing process requires extensive chemical process infrastructure including waste heat recovery, steam generation, cooling water systems, gas purification, and gas storage and delivery systems

B. Instrument Description

1. Open-Path Monitors

The Goodrich Corporation fenceline air monitoring system includes both open-path tunable diode laser spectrometers (TDLAS), and open-path ultraviolet Doppler optical absorption spectrometers (UVDOAS). Open-path monitors operate by projecting a beam of light through open air to retroreflectors that reflect the light back to the monitor where spectral absorption characteristics are measured. As the light travels along the path length a certain amount of this light will be absorbed by the various chemical species present in the air. Because all gases absorb light differently according to their own unique spectral characteristics, it is possible to use measurements of absorption intensity at specific wavelengths as a proxy for measuring a target gas' concentration in the air.

Therefore, along a known path length, an absorption measurement taken at the appropriate wavelength for the target molecule can easily be used to solve for its average concentration over the length of the beam.

The Goodrich Corporation system will consist of three TDL analyzers and six UVDOAS analyzers at the locations shown in Figure 2 and as outlined in Table 2. The light is transmitted to a retroreflector and back to a detector co-located with the transmitter. The analyzer software will provide five-minute and hourly-average concentration measurements for each path.

- ***Open Path (OP) Ultra Violet Differential Optical Absorption Spectroscopy (UVDOAS)***

For the monitoring of benzene, the Goodrich Corporation facility uses Open Path (OP) Ultraviolet Differential Optical Absorption Spectroscopy (UVDOAS). This technology quantifies concentrations of gaseous compounds by measuring the absorption of ultraviolet light by chemical compounds in the air and applying the Beer-Lambert Law. UVDOAS typically uses unique absorptions of specific wavelengths of ultraviolet light in a wavelength range of 245 to 380 nanometers (nm). Benzene peaks are found close to the 253 nm wavelength.

Open path UVDOAS instrumentation consists of a light source, transmitting and receiving optics (telescopes), a spectrometer, a reflector or receiver, a detector, and a data processing computer. A Xenon light source provides light, which is focused in a collimated beam before it is sent through a transmitting telescope and into the measurement path. A receiving telescope collects the light and directs it to the spectrometer which diffracts the light onto the detector. The detector is typically a solid-state array such as a charge-coupled device (CCD). This allows the detector to collect light of different wavelengths without moving parts. The spectra bands can be extracted from the spectrum and compared to reference spectra to determine which compounds were present along the path and at what concentrations.

A combination of monostatic and bistatic open path instruments have been selected to reduce the need for substantial power at the retroreflector sites and improve detection limits by increasing effective path lengths.

The Goodrich Corporation facility uses the UV Sentry Open Path Multi-Gas Analyzer (UV Sentry) manufactured by Cerex Monitoring Solutions, LLC for the monitoring of benzene. The UV Sentry uses no moving parts to wear out, it should not fail or require calibration, which keeps consumables and maintenance to a minimum. The UV Sentry has an on-board computer and saves raw spectral data independent of calibration. These spectra may be used at any time to verify real time measurements.

Additionally, the UV Sentry records signal intensity and minimum detection limits (MDLs) for benzene in real time as data quality indicators. Real time MDL output supports both American Society for Testing and Materials (ASTM) and USEPA methods. The UV Sentry also has a flow through calibration cell to allow for regular QA audits and bump tests.

- ***Open Path (OP) Tunable Diode Laser Absorption Spectroscopy (TDLAS)***

For the monitoring of Hydrogen Sulfide and Hydrogen Cyanide[1], an Open Path (OP) Tunable Diode Laser Absorption Spectroscopy (TDLAS) is used. OP-TDLAS offers some significant operational and cost advantages over other measurement technologies such as Fourier Transform Infrared Spectroscopy (FTIR). Tunable diode lasers (TDL) are designed to focus on single absorption wavelengths specific to a compound of concern in the gaseous form. They are capable of achieving low detection limits and are generally interferent-free. Similar to UVDOAS, quantitative measurements in direct gas phase laser absorption spectroscopy are based on the Beer-Lambert Law. A TDL uses a diode to generate light within a narrow frequency range that contains a relatively unique absorption wavelength of the chemical of interest. The laser frequency is "tuned" by changing the temperature of the diode or the current being fed to the diode or both so that it matches the spectral absorption line of interest.

Similar to the UVDOAS system, the OP-TDLAS system consists of a light source, a spectrometer, a reflector, a photodiode detector, and a data processing computer. Monostatic (as opposed to bistatic) open path instruments have been selected to reduce the need for substantial power at the retroreflector sites, and improve detection limits by increasing effective path lengths.

The Goodrich Corporation facility uses the LasIR™ Fence Line Monitoring Gas Analyzer manufactured by Unisearch Associates Inc. for the monitoring of Hydrogen Sulfide and Hydrogen Cyanide.[1] The LasIR™ allows one laser to send beams at two different wavelengths down each path length (one for each compound). Additionally, the beam can be split allowing it to monitor two path lengths with one laser. The controller uses a near infrared (NIR) Tunable Diode Laser Absorption Spectrometer System utilizing a single mode laser mounted in a thermoelectric cooler. A Windows based software package displays the data on a host laptop PC. The LasIR™ also has a flow through calibration cell to allow for regular QA audits and bump tests.

2. Meteorological Monitors

The meteorological monitoring tower is located at the northwest end of the Goodrich Corporation property. This tower is outfitted with high quality meteorological instruments, as outlined in Table 1, and are capable of making accurate real time measurements continuously. All sensors will be connected to a datalogger which will store the data, as well as broadcast it out to a cellular modem so that data can be viewed or downloaded at any time, from anywhere. The specific meteorological instruments chosen meet EPA specifications for accuracy, range and resolution (Table 1) and have been deemed appropriate for use in the fenceline monitoring system. Data from these sensors will be used to calculate 1-hour rolling averages updated every five minutes.

[1] Hydrogen sulfide is neither used nor stored at, nor are they emitted from the Goodrich Corporation. Therefore, the facility does not have the potential to emit this compound, which comprise "Covered Air Toxics" under HB21-1189.

Table 1: Performance Specifications for Installed Meteorological Sensors

Parameter	Sensor Make and model	Reporting units	Accuracy	Range
Horizontal wind speed	Met One 010C	Meters per second (m/s)	± 0.1	0 to 55
Horizontal wind direction	Met One 020D	Degrees (°)	± 3	0 to 360
Temperature	Met One 065	Degrees of Celsius (°C)	± 0.15	-30 to +50
Relative humidity	Met One 083F/0/35	Percentage (%)	± 2	0 to 100
Barometric pressure	Met One 0192	Atmospheres (atm)	± 0.001	0.3 to 1.09

C. System Design

The fenceline monitoring system will utilize three primary shelters to house the open path analyzers. Shelters 1 and 6 (Figure 2) will house one (1) monostatic open-path tunable diode laser (TDL) analyzer, one (1) monostatic open-path ultraviolet differential optical absorption (UV-DOAS) analyzer and one (1) bistatic open-path UV-DOAS receiver. Shelter 3 will house one (1) monostatic open-path TDL analyzer, and two (2) bistatic open-path UV-DOAS receivers.

Each open-path analyzer location will have multiple paths, where each path is measured continuously. At the end of each path there will be a retroreflector opposite the analyzer for the monostatic systems and a receiver opposite the analyzer for the bistatic systems. Each path ID consists of a number. Path numbers range from 1 to 6 (Figure 2, Table 2). The specific locations for all open path equipment were selected in order to provide coverage of all facility emission sources within the constraints of the facility footprint.

This monitoring program also includes meteorological monitoring as required in HB21-1189. Meteorological monitoring is necessary to characterize wind patterns for understanding movement of the three target compounds and potential sources of emissions, whether they originate from the site or a neighboring facility. A meteorological tower will be installed near Shelter 6 (Figure 2) so that power can be shared.

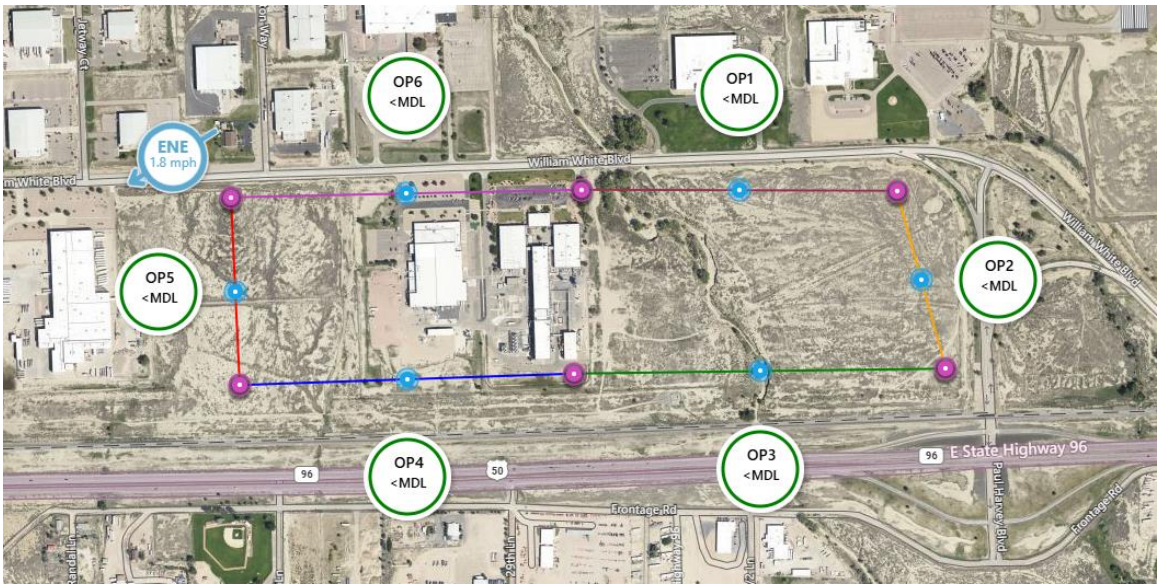

Figure 2. Approximate Layout of the Goodrich Corporation FLMP

Table 2: Descriptions of Each Individual Path

Path	Path Length (one way)	Compounds
1	558 meters	Hydrogen sulfide Hydrogen cyanide Benzene
2	283 meters	Hydrogen sulfide Hydrogen cyanide Benzene
3	613 meters	Hydrogen sulfide Hydrogen cyanide Benzene
4	566 meters	Hydrogen sulfide Hydrogen cyanide Benzene
5	297 meters	Hydrogen sulfide Hydrogen cyanide Benzene
6	569 meters	Hydrogen sulfide Hydrogen cyanide Benzene

D. Data Validation and QA/QC Procedures

-Automated Quality Control Procedures

Many Quality Control procedures for the fenceline monitoring network are integrated directly into the AirSense data platform and are outlined as follows. These automated procedures allow for the ability to screen data not suitable for public display due to atmospheric or operational issues. These automated quality control checks include:

- Inspection of daily reports generated by the AirSense platform which summarize data recovery for each analyzer/sensor and suspect data flags;
- Monitoring of real time alerts and daily reports generated by the AirSense data platform that flag:
    - No data;
    - Data sticking – if values are repeated for a number of sampling intervals (does not apply to data below the detection limit);
    - Range exceedances – if values are outside a reasonable minimum or maximum value;
    - Data recovery;
    - Monitoring instrument parameters that may indicate equipment degradation / failure or a need for maintenance and / or cleaning;
    - Signal intensity (open path instruments);
    - Instrument or sensor alarms or error codes;
    - Analyzer and shelter temperatures; and
    - Laser parameters (TDL instruments)

Table 3: List of automated quality control parameters and corresponding evaluation criteria

Instrument	Automated Quality Control Parameter	Definition	Units	Evaluation criteria
UV-DOAS	MDL	Minimum detection limit	PPB	< 25% of alert threshold
	R^2	Percentage peak match	%	> 64
	Signal intensity	Signal intensity at full scale	%	> 40
	UV spectrometer temperature		^oC	35
TDL	MDL	Minimum detection limit	PPB	< 25% of alert threshold for paths 1,3,4,6 <50% of alert threshold

				for H2S paths 2 and 4
	Absolute Signal	Detector Signal	mA	> 0.1
	Laser temperature stability	Absolute value of (laser temperature- laser temperature in long average) *100/ laser temperature in long average	%	< 5
	R	Peak correlation		> 0.8

-Instrument Quality Control Checks

Both the UV-DOAS and TDL systems are designed to require only modest service and maintenance. Section 5.4 of the FLMP summarizes the UV-DOAS and TDL maintenance activities as recommended by the manufacturer. These activities will help ensure data integrity and maximize up-time. For the UV-DOAS system, a calibration verification bump test is performed on a quarterly basis using a flow through cell. For the UV-DOAS system, precision is calculated by evaluating the variance of pollutant concentrations during a period of low atmospheric variability. Five-minute data are selected when concentrations are well above the minimum detection limit (MDL) during periods of low variability. The precision can then be determined by calculating the coefficient of variation (CV). For the UV-DOAS, robustness can be determined by calculating the desired signal intensity in order for the benzene minimum detection limit to be lower than 25% of the notification threshold. If the measured signal intensity is found to be below the desired value, corrective action will be required (e.g., replace light source, instrument alignment, etc.). The QC checks for the UVDOAS are summarized in Table 4.

Table 4: UV DOAS QC Checks

QA/QC Check	Frequency	Acceptance Criteria
Accuracy and precision (Bump Test)	Quarterly	Accuracy: ≤ 30% of reference gas value Precision: ± 25%
Baseline Stability	Continuous	± 5%
Signal intensity	Continuous	>60%
Robustness	Continuous	Compound MDL lower than 25% of notification threshold

For the TDL system, a calibration verification bump test is performed on a quarterly basis. The bump test simulates system-observed gas content at the required path average concentration and is used to verify

that the system can detect concentrations at or below the levels of concern. For the TDL system, precision will be calculated by evaluating the variance of pollutant concentrations during a period of low atmospheric variability. Five-minute data will be selected when concentrations are well above the minimum detection limit during periods of low variability. The precision can then be determined by calculating the coefficient of variation (CV). If there are no periods of low variability with concentrations above the minimum detection limit, bump test data will be used for the precision determination. For the TDL system, robustness can be determined by calculating the desired signal intensity for the hydrogen sulfide and hydrogen cyanide minimum detection limit to be lower than 25% (and 50% for H2S Paths 2 and 5) of the corresponding notification thresholds. If the measured signal intensity is found to be below the desired value, corrective action will be required (e.g., replace laser, instrument alignment, etc.). The QC checks for the TDL are summarized in the table as follows.

Table 5: TDL QC Checks

QA/QC Check	Frequency	Acceptance Criteria
Accuracy and precision (Bump Test)	Quarterly	Accuracy: ≤ 30% of reference gas value Precision: ± 25%
Baseline Stability	Continuous	± 5%
Signal intensity (Absolute Power)	Continuous	>0.1 mA
Robustness	Continuous	Compound MDL < 25% of alert threshold for paths 1,3,4,6 and Compound MDL <50% of alert threshold for H2S paths 2 and 4

Wind speed, wind direction, temperature, relative humidity and barometric pressure measurement systems will be aligned, tested and calibrated at the time of installation and at six-month intervals thereafter using test equipment traceable to NIST or other authoritative standards and following standard operating procedures. Calibrations are performed immediately following scheduled semi-annual meteorological audits and performance of scheduled preventive and/or corrective maintenance for the monitoring instruments. Following initial startup calibrations and continuing throughout the monitoring program, the field operator performs quarterly site checks on the meteorological monitoring systems. In the course of these checks, sensors will be observed for proper operation. The monitoring instruments and support equipment are visually inspected to confirm operational integrity. The current data logger readings are assessed for agreement with prevailing conditions.

-Data Quality Assurance

All continuous data from the monitoring equipment are transferred to the cloud-based servers every five minutes. Each business day, a data technician checks the data files to ensure that all data were successfully transmitted and stored in the database. If data are missing, they are manually retrieved from the computers that control each piece of equipment or the on-site data logger for the meteorological

equipment. This data is the raw data collected from the instrument computers or data logger and is considered “Level 1” data. These data are used to monitor instrument operations on a regular basis but are not used for reporting until subject to further review and validation. Level 1 (raw) data files are kept intact and unedited. These data are not subject to reduction or reformatting.

“Level 1” data are “raw” data; i.e., data obtained directly from the instrument computers or data logger that have not yet been subjected to quality assurance review. Electronic files of the raw data record are archived "as is"; no alteration is made to the raw data files. All data processing, editing and validation work is accomplished by working with copies of the raw data files produced by the data management system software upon request. Level 1 data are manually reviewed for reasonableness and completeness. Initial (daily) review of the data occurs no more than four days after sample acquisition because of weekends and holidays. Daily data review includes checking for status or event flags, reasonableness of reported averaged data values (out-of-range, inconsistent or excessive transition values) and any missing data periods. The operating status of each instrument is also reviewed (e.g., sample flow rates; other internal operating parameters). Meteorological data are reviewed for agreement with local seasonal and prevailing conditions and internal consistency. These daily reviews support “Level 2” validation of the data and provide a decision basis for investigative actions, instrument adjustment and calibration. The data analyst annotates the separate data processing file (i.e., an electronic copy of the original raw data file) and produces a summary report of any suspect data or out-of-tolerance operating conditions. Any situation requiring investigative and/or corrective action is immediately brought to the attention of the Project Manager and Technical Lead. A “Non-Conformance / Corrective Action” (NC/CA) report documenting all pertinent information regarding suspect data, a non-conformance event or out-of-tolerance operating condition is generated and updated with further information as it becomes available until the problem is fully resolved.

All data reporting forms and activity logs completed during the previous month are stored in Montrose’s local Denver office and are reviewed against the electronic data record on a monthly basis in support of data processing and validation. Monthly review of the field monitoring documentation will include:

- All completed routine site check forms;
- Documentation of the QC tests performed on the monitors during the previous month;
- Documentation of any maintenance activities performed on the monitors during the previous month;
- Documentation of any quality assurance audits performed on the meteorological sensors during the previous month; and
- Documentation of any Non-Conformance/Corrective Action (NC/CA) events that occurred during the previous month.

During “Level 2” data validation, the data file of each continuously-monitored parameter is processed at monthly intervals to develop an initial data report to be reviewed for completeness and correctness. Any corrections or additions to the raw “Level 1” data file are annotated in the processing data file with explanatory comments. Any hours incorporating a test, calibration or other quality control check, corrective or preventive maintenance, instrument malfunction, power failures, weather event, etc. are removed from the data set and annotated with the appropriate null data code (for detail on null data codes and corresponding descriptions see Table 11 of Appendix F). Results of this review, including any data losses equal to or greater than one hourly block average, are documented and dated by the data technician in “Level 2” data files. The data technician enters and annotates any null data codes or corrections required in the “Level 2” electronic data file. When all entries or corrections are complete, the data are designated as “Level 2 - Final” data, and are archived for subsequent final data validation review.

“Level 3” data validation review is performed by senior project personnel other than the data processing analyst. During the Level 3 data validation process, data losses due to activity or instrument malfunction are corroborated against documentation noted by the station field operators on completed field forms. The field form record identifying data affected by these activities and events are inter-compared with corresponding status flags entered by the operator in the digital data record. Documented results of QA/QC checks performed on each analyzer are evaluated with respect to relevant acceptance and performance criteria outlined in the fenceline monitoring plan. Reports documenting unacceptable operating conditions or non-conformance/corrective action (NC/CA) events that may have adversely impacted data quality are also reviewed. If discrepancies or questionable data values are identified during the validation process, the entire data record is reviewed (including all annotated corrections made for Level 2 data). Any additional corrections or revisions made to the data report file during the data validation review are documented, dated and signed by the validation reviewer. The corrections are then entered into the electronic data file and re-processed. A separate file containing the corrections is checked for accuracy against the documented corrections. When all corrections are complete and checked, a final “Level 3 - Validated” data file is produced.

V. Results

A. Monthly Data Summary

Table 6: Monthly Data Summary

Month	Path	Compound	Number of Exceedances[1]	0th[2]	25th[2]	50th[2]	75th[2]	100th[2]	Avg	Pct Detect[3]	Pct Valid[4]	Median 1hr DL[5]
Apr-25	1	Benzene	0	0.6	2.1	4.7	11.9	313.5	10.1	0.00%	98.34%	6.7
May-25	1	Benzene	0	1.5	7.1	12.8	19.6	202.9	14.4	0.05%	97.97%	18.1
Jun-25	1	Benzene	0	0.2	5.5	11.3	19.0	318.5	13.1	0.01%	94.79%	16.1
Apr-25	1	H2S	0	1.9	8.1	14.2	22.9	67.9	16.8	0.45%	87.61%	20.1
May-25	1	H2S	0	0.8	9.4	15.5	24.9	66.5	18.1	1.09%	88.32%	21.7
Jun-25	1	H2S	0	2.1	11.9	20.0	30.4	58.3	22.0	1.19%	80.33%	28.7
Apr-25	1	HCN	0	0.0	0.2	0.5	1.0	3.7	0.7	0.19%	93.33%	0.7
May-25	1	HCN	0	0.0	0.1	0.2	0.4	1.9	0.3	0.00%	97.98%	0.3
Jun-25	1	HCN	0	0.0	0.1	0.2	0.3	2.2	0.3	0.00%	99.32%	0.3
Apr-25	2	Benzene	0	0.3	1.0	1.5	2.5	79.4	2.5	0.00%	100.00%	2.2
May-25	2	Benzene	0	0.4	1.3	2.5	3.7	118.0	2.7	0.67%	99.34%	3.5
Jun-25	2	Benzene	0	0.1	1.2	2.4	4.1	681.2	3.3	7.40%	93.11%	3.3
Apr-25	2	H2S	0	2.0	10.9	14.9	21.1	58.6	17.1	0.61%	90.69%	21.3
May-25	2	H2S	0	1.5	10.4	14.3	20.5	58.9	16.4	0.57%	85.86%	20.5
Jun-25	2	H2S	0	2.6	12.0	17.5	25.2	72.4	19.7	0.61%	78.62%	25.4
Apr-25	2	HCN	0	0.1	0.3	0.5	1.4	15.3	1.3	1.67%	98.59%	0.7
May-25	2	HCN	0	0.1	0.3	0.4	0.6	4.3	0.5	0.00%	99.24%	0.6
Jun-25	2	HCN	0	0.0	0.3	0.4	0.7	3.4	0.6	0.00%	99.62%	0.6
Apr-25	3	Benzene	0	0.2	0.4	0.5	0.7	19.4	0.7	0.00%	99.04%	0.7
May-25	3	Benzene	0	0.1	0.4	0.5	0.7	73.2	0.6	0.00%	99.24%	0.7
Jun-25	3	Benzene	0	0.2	0.3	0.5	0.7	114.3	0.6	0.00%	98.34%	0.7

Apr-25	3	H2S	0	0.4	3.5	5.2	7.7	21.1	6.5	0.00%	95.68%	7.5
May-25	3	H2S	0	0.2	2.9	4.8	8.0	58.0	6.6	0.00%	98.73%	6.9
Jun-25	3	H2S	0	0.3	4.5	8.6	17.2	97.2	12.7	0.10%	98.37%	12.3
Apr-25	3	HCN	0	0.0	0.4	0.8	1.3	9.1	1.0	1.43%	95.66%	1.1
May-25	3	HCN	0	0.0	0.1	0.4	0.7	7.4	0.6	0.26%	99.01%	0.5
Jun-25	3	HCN	0	0.0	0.0	0.1	0.3	5.1	0.3	0.17%	98.97%	0.1
Apr-25	4	Benzene	0	3.5	25.8	28.1	30.9	37.5	27.5	0.00%	97.89%	39.8
May-25	4	Benzene	0	2.9	13.6	21.6	25.7	82.0	20.1	0.00%	98.66%	30.6
Jun-25	4	Benzene	0	0.1	1.6	16.8	22.5	228.3	13.7	0.00%	98.49%	23.8
Apr-25	4	H2S	0	0.2	2.4	3.9	6.4	56.8	5.6	0.00%	94.46%	5.5
May-25	4	H2S	0	0.3	2.1	3.7	7.4	43.7	5.9	0.14%	98.79%	5.3
Jun-25	4	H2S	0	0.1	3.1	6.4	13.5	48.2	9.6	0.05%	97.10%	9.1
Apr-25	4	HCN	0	0.0	0.4	0.8	2.2	33.3	1.6	5.64%	90.62%	1.1
May-25	4	HCN	0	0.0	0.2	0.4	0.8	40.0	0.7	0.16%	98.30%	0.5
Jun-25	4	HCN	0	0.0	0.1	0.2	0.4	31.6	0.6	0.84%	97.38%	0.3
Apr-25	5	Benzene	0	0.3	0.9	1.5	2.3	65.8	2.4	0.00%	99.18%	2.2
May-25	5	Benzene	0	0.4	1.5	2.2	3.0	44.6	2.5	0.00%	96.72%	3.1
Jun-25	5	Benzene	0	0.2	1.2	2.4	3.3	96.9	2.7	0.00%	98.41%	3.3
Apr-25	5	H2S	0	0.4	5.8	11.1	18.5	116.9	14.4	0.09%	98.45%	15.8
May-25	5	H2S	0	0.3	4.5	10.0	20.2	104.5	15.4	0.35%	97.92%	14.3
Jun-25	5	H2S	0	0.3	8.3	17.6	31.5	114.8	22.7	0.79%	95.92%	25.0
Apr-25	5	HCN	0	0.1	0.5	1.7	3.1	21.2	2.3	0.00%	95.78%	2.4
May-25	5	HCN	0	0.1	0.6	1.8	4.2	29.7	3.5	0.00%	99.32%	2.5
Jun-25	5	HCN	0	0.0	0.3	0.5	1.5	36.9	2.5	0.00%	97.57%	0.7
Apr-25	6	Benzene	0	0.1	0.3	0.6	0.8	18.0	0.7	0.00%	99.66%	0.9
May-25	6	Benzene	0	0.2	0.6	0.8	1.1	142.4	0.9	0.00%	99.18%	1.1
Jun-25	6	Benzene	0	0.1	0.5	0.7	1.1	28.3	0.9	0.15%	98.67%	1.0
Apr-25	6	H2S	0	0.3	2.9	5.0	8.4	52.8	6.6	0.00%	90.82%	7.1
May-25	6	H2S	0	0.1	1.6	3.7	8.4	47.9	6.3	0.22%	91.23%	5.3
Jun-25	6	H2S	0	0.1	2.6	5.8	12.9	55.1	9.6	0.02%	61.23%	8.4
Apr-25	6	HCN	0	0.0	0.1	0.1	0.4	3.5	0.3	0.00%	91.59%	0.2

May-25	6	HCN	0	0.0	0.1	0.1	0.2	1.5	0.2	0.00%	84.37%	0.2
Jun-25	6	HCN	0	0.0	0.0	0.1	0.2	1.7	0.2	0.00%	67.08%	0.1

[1] number of 1-hour measurements above the notification threshold value
[2] data quartiles = the value at which a defined percentage of data existing below this value (valid data only)
[3] the percentage of hourly averages above the detection limit (DL) as compared to the total possible hourly averages (excluding data collected during QA/QC activities, calibration, or maintenance).
[4] the proportion of the 1h measurements that pass all data verification measures compared to the possible hourly averages.
[5] the median 1-hr detection limit observed across validated measurements per compound for the month specified.

B. Summary of Invalidated Data

The invalidated data can be found in file “Goodrich Corporation FLMP Data Packet_Q2 2025”. All 5min data have been validated based on the procedures described in the Goodrich Corporation fenceline monitoring plan.

C. Discussion of Invalidated Data

The data was validated based on the procedures mentioned in the fenceline monitoring plan. During this first quarter of the fenceline monitoring program operation, there was a relatively low invalidation rate for H2S and HCN Path 6 for the period of June 2025 with an average valid data percentage of approximately 64%. Goodrich is not emitting nor storing H2S but there is a nearby H2S source related to a pumping station. All other compounds had high validation rates exceeding 95% in most cases.

D. Discussion of Results

As shown in the summary plots, the concentration of the three compounds of interest was below detection limit in most cases. There were no threshold exceedances during Q2 of 2025 for any of the compounds. For benzene the average median MDL value was around 8.8 ppb, for H2S the average median MDL value was approximately 14.4 ppb, and for HCN the corresponding average median MDL was around 0.7 ppb.

E. Summary Plots

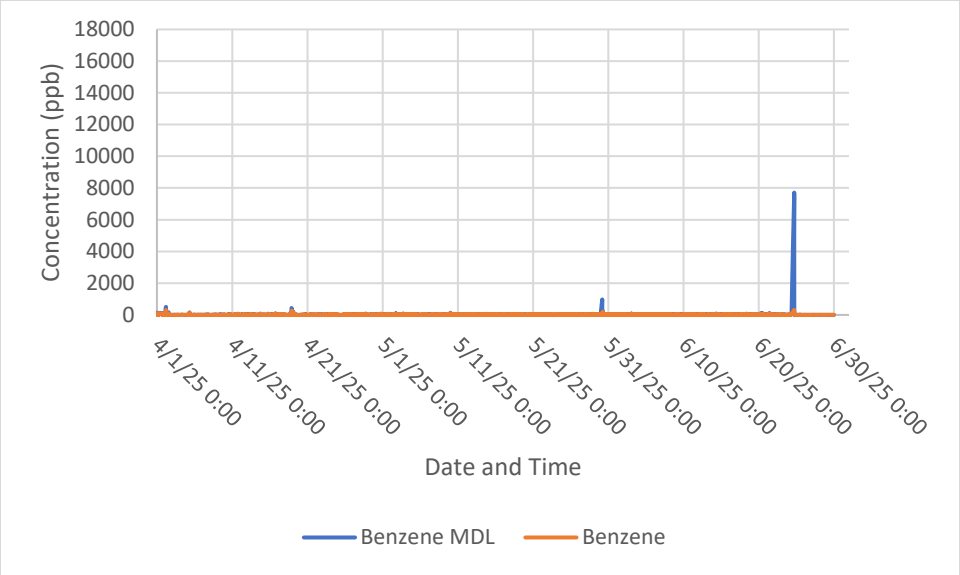

Figure 3. Timeseries of Benzene Path 1

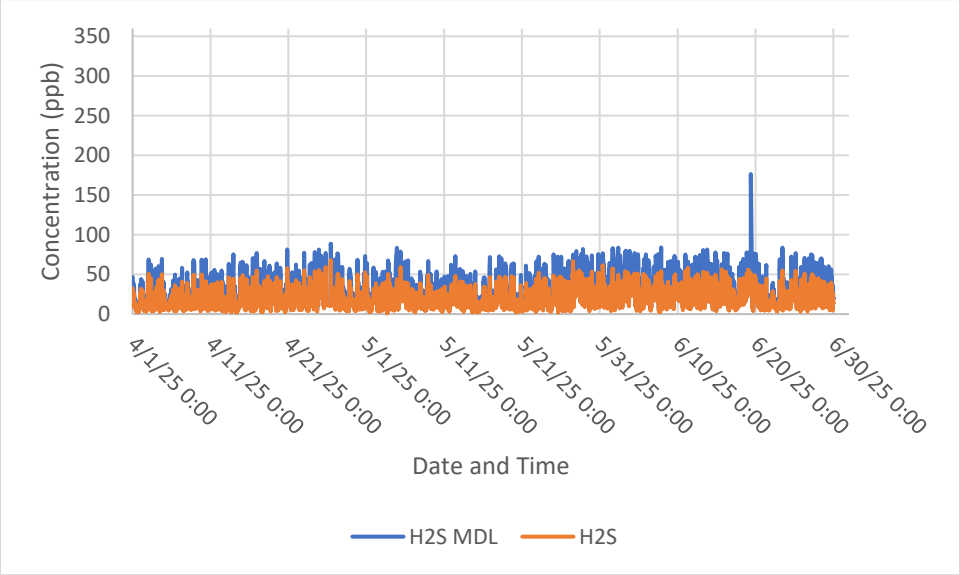

Figure 4. Timeseries of H_2S Path 1

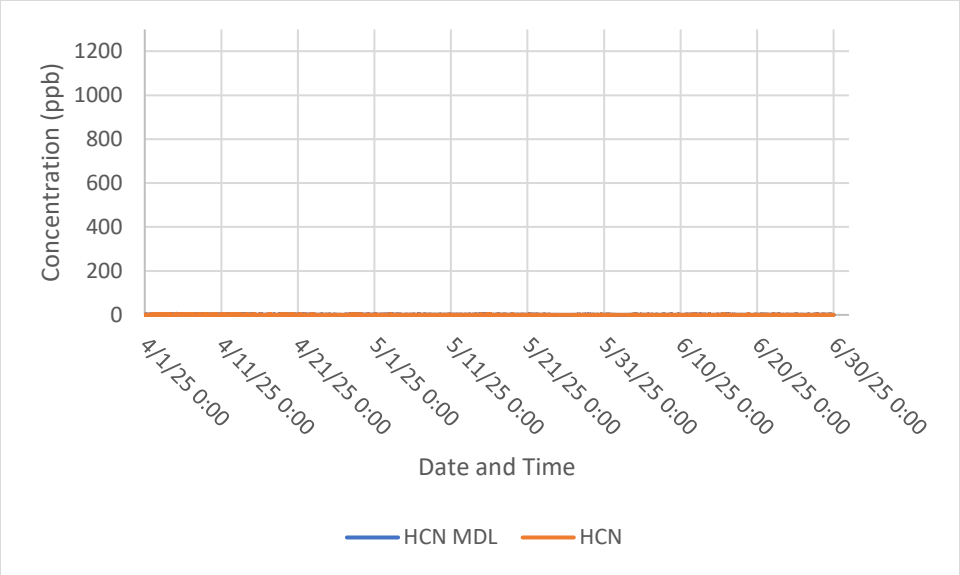

Figure 5. Timeseries of HCN Path 1

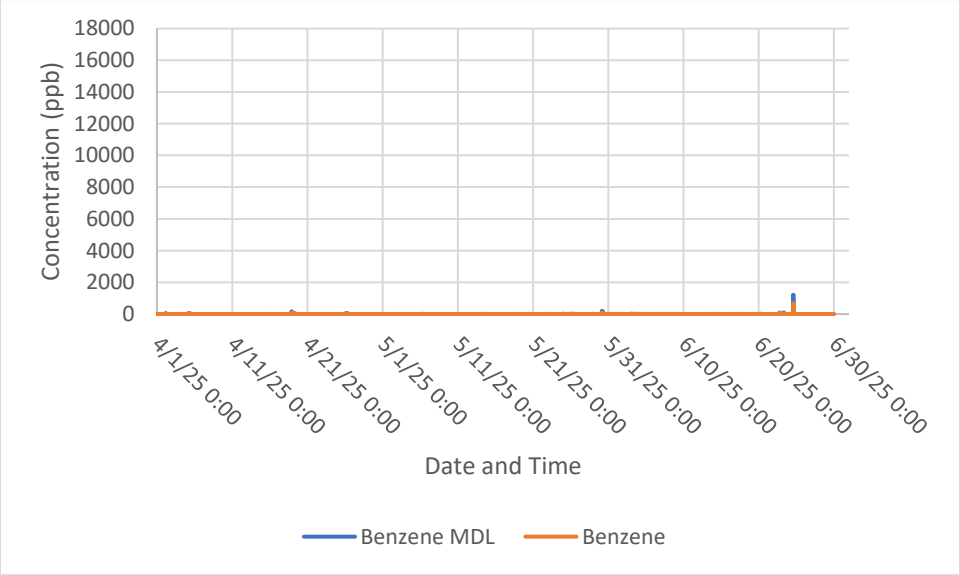

Figure 6. Timeseries of Benzene Path 2

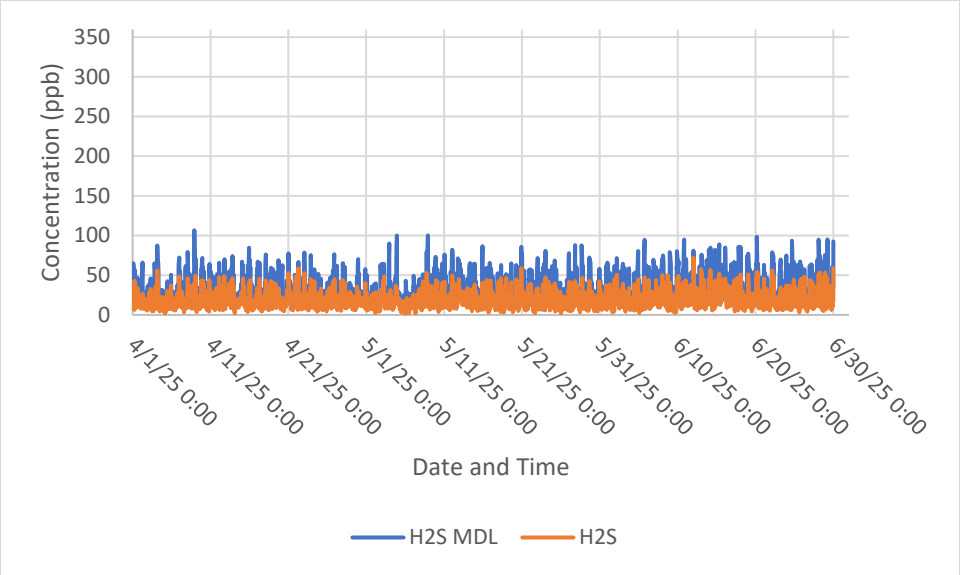

Figure 7. Timeseries of H_2S Path 2

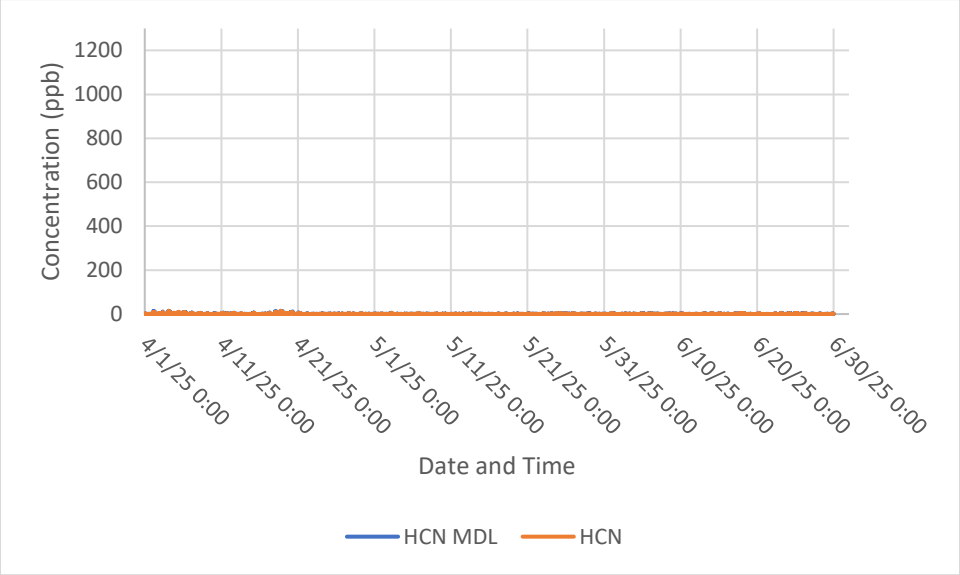

Figure 8. Timeseries of HCN Path 2

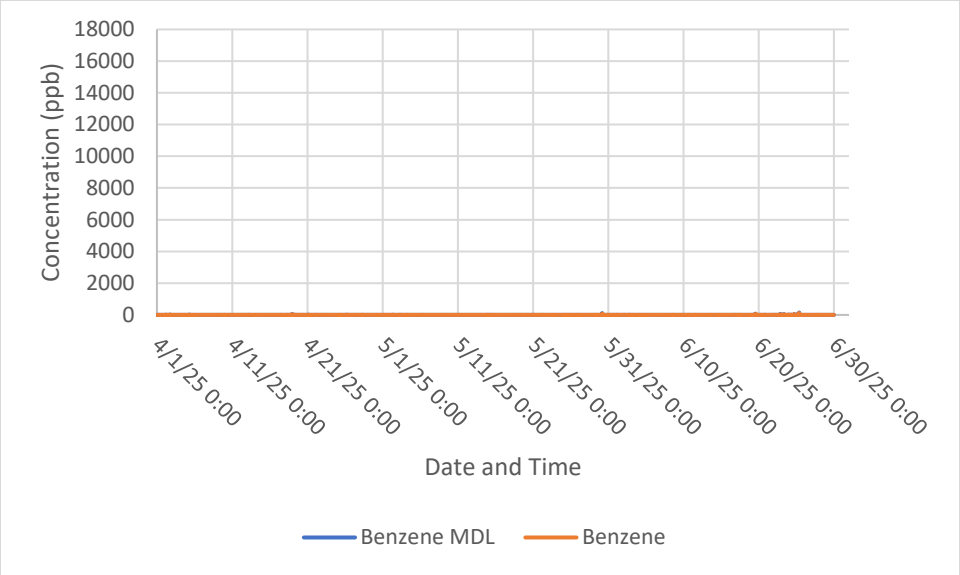

Figure 9. Timeseries of Benzene Path 3

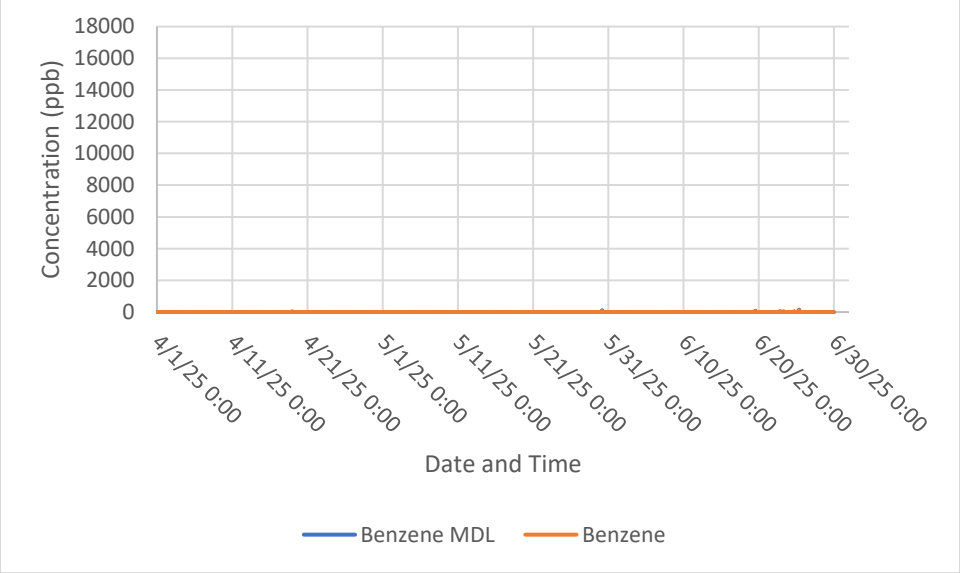

Figure 10. Timeseries of H2S Path 3

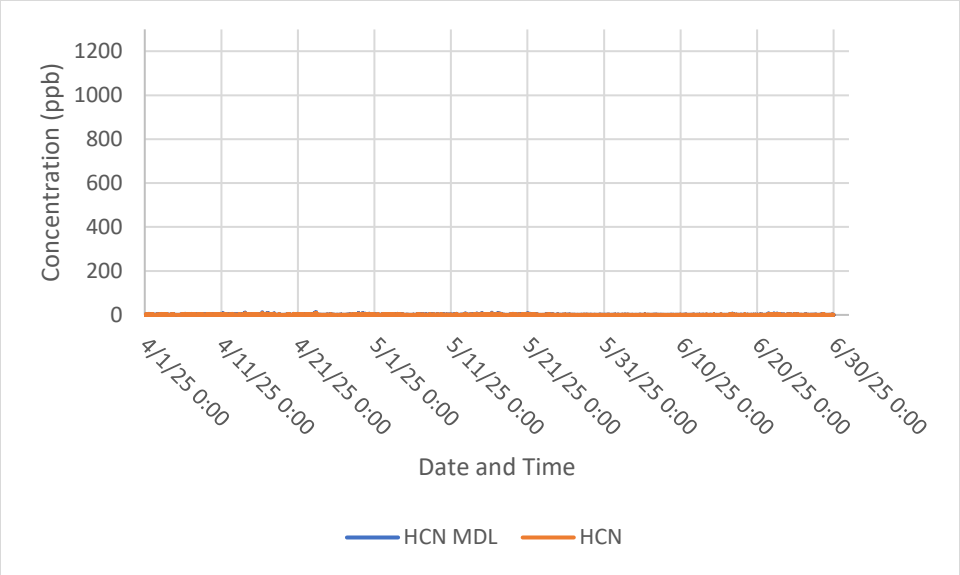

Figure 11. Timeseries of HCN Path 3

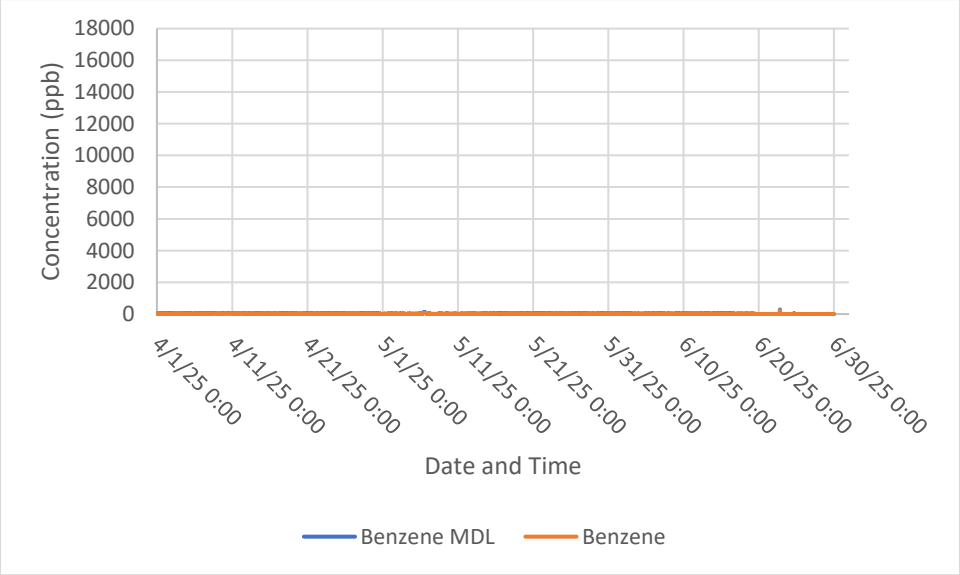

Figure 12. Timeseries of Benzene Path 4

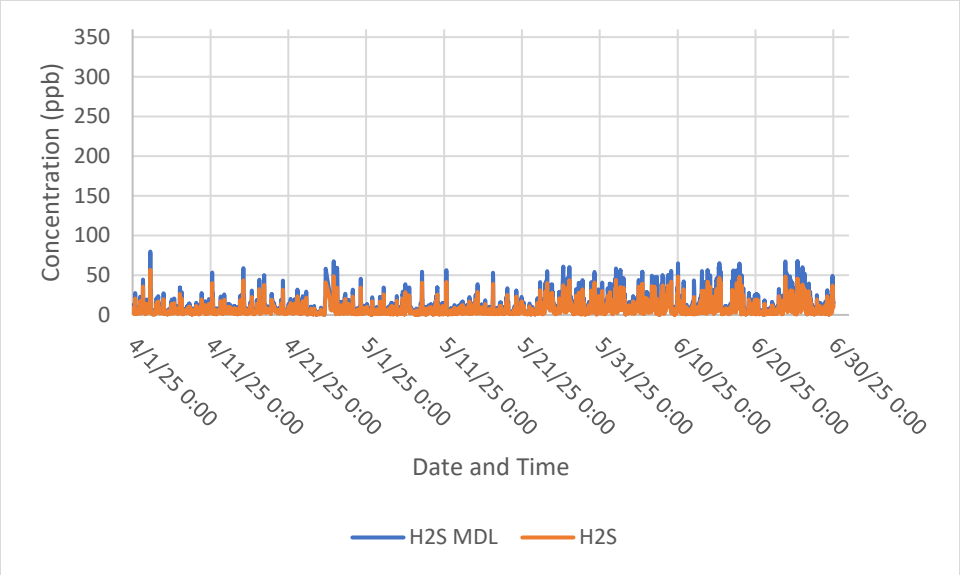

Figure 13. Timeseries of H2S Path 4

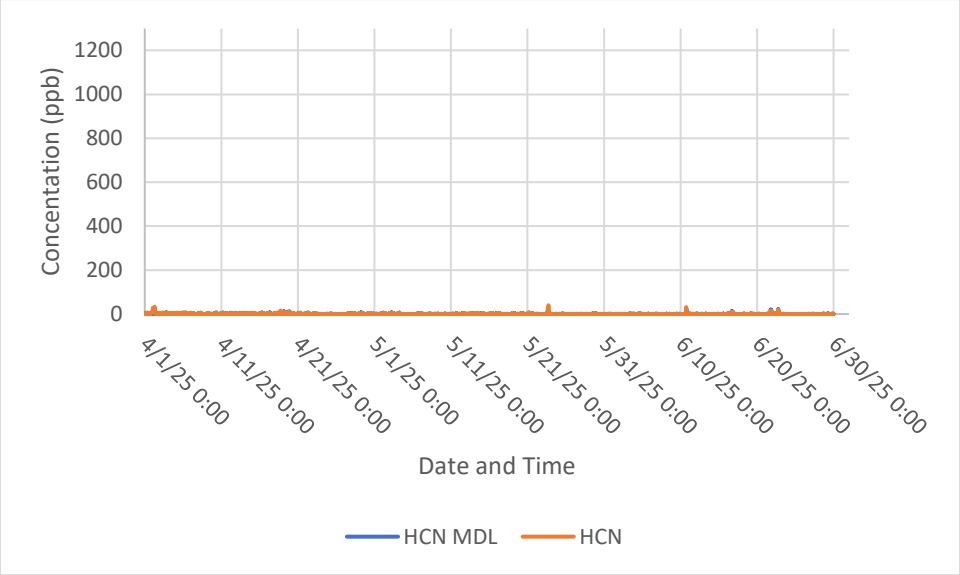

Figure 14. Timeseries of HCN Path 4

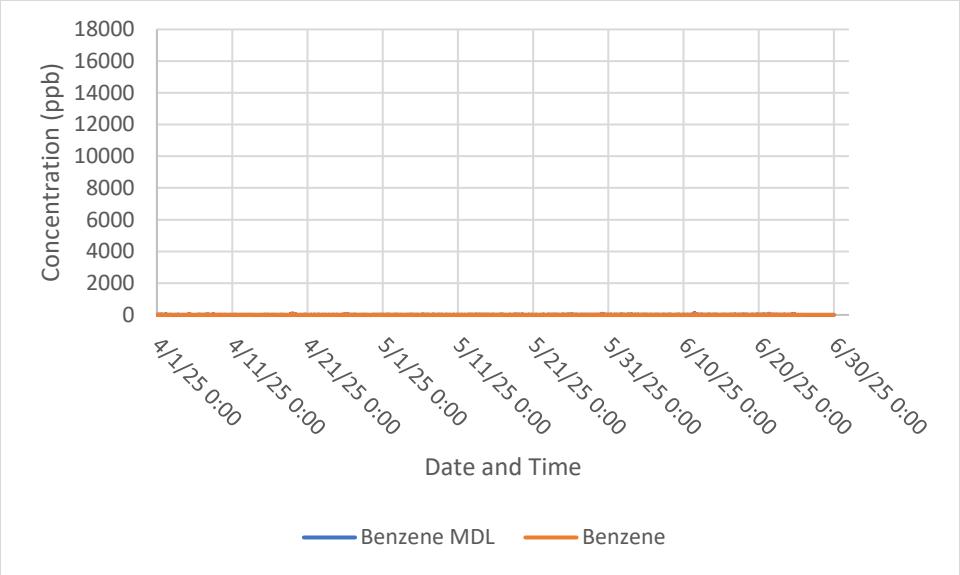

Figure 15. Timeseries of Benzene Path 5

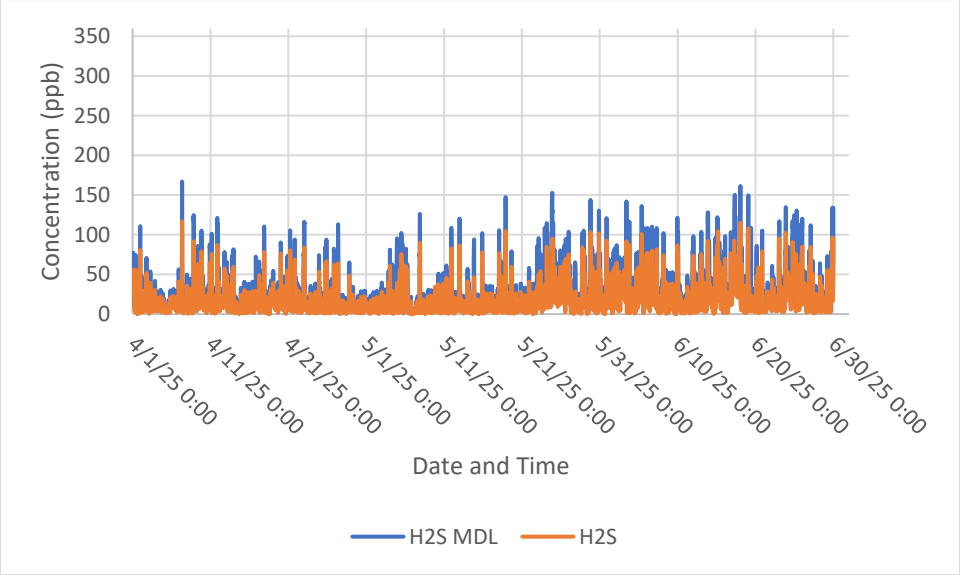

Figure 16. Timeseries of H2S Path 5

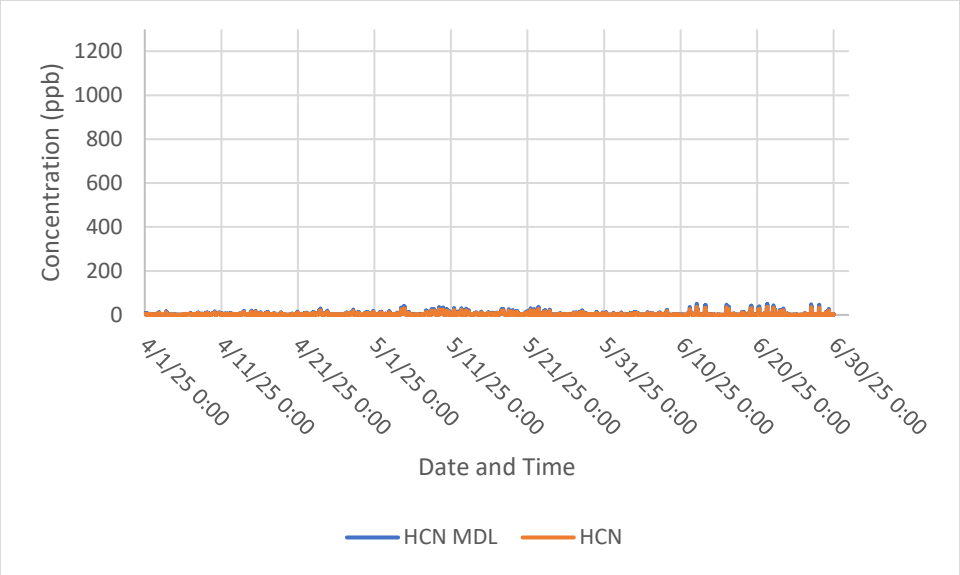

Figure 17. Timeseries of HCN Path 5

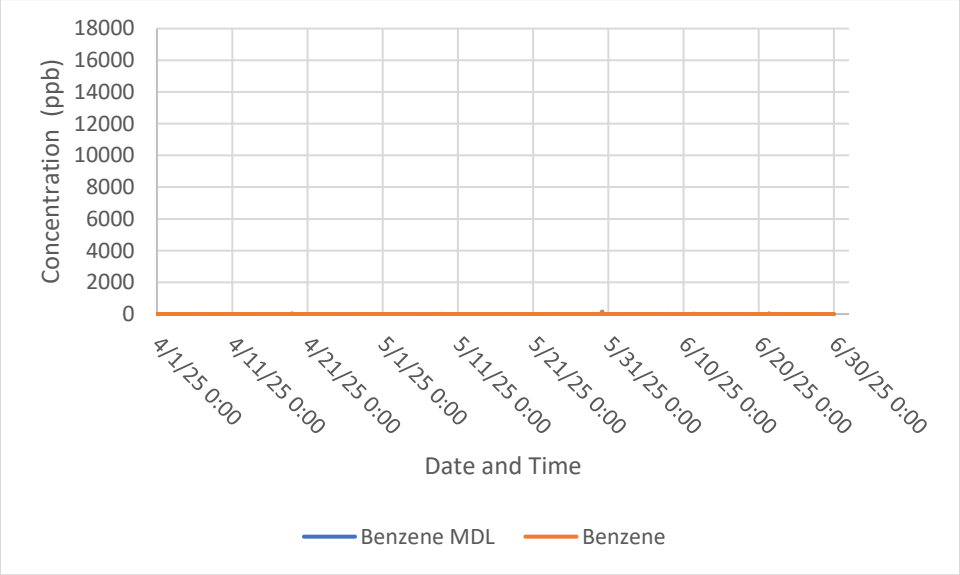

Figure 18. Timeseries of Benzene Path 6

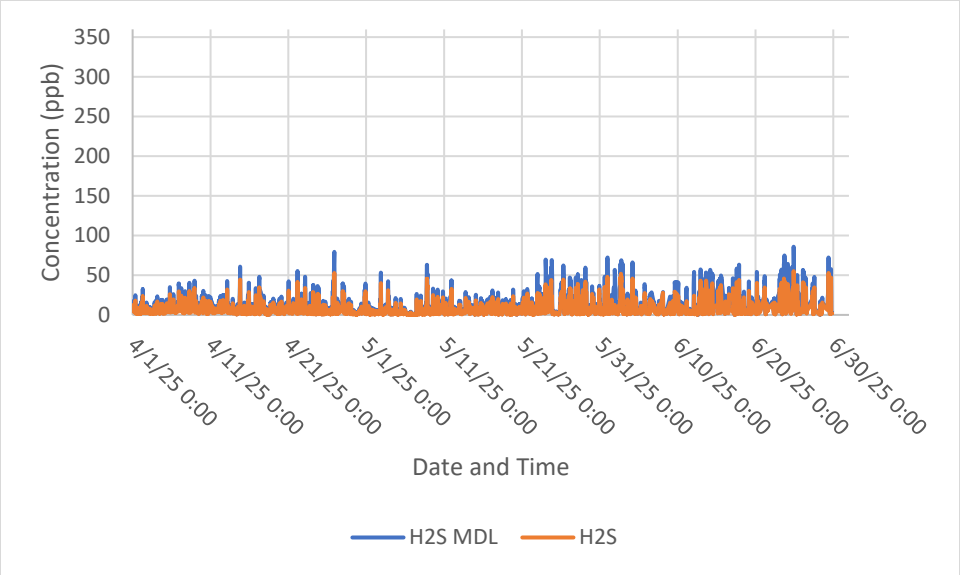

Figure 19. Timeseries of H2S Path 6

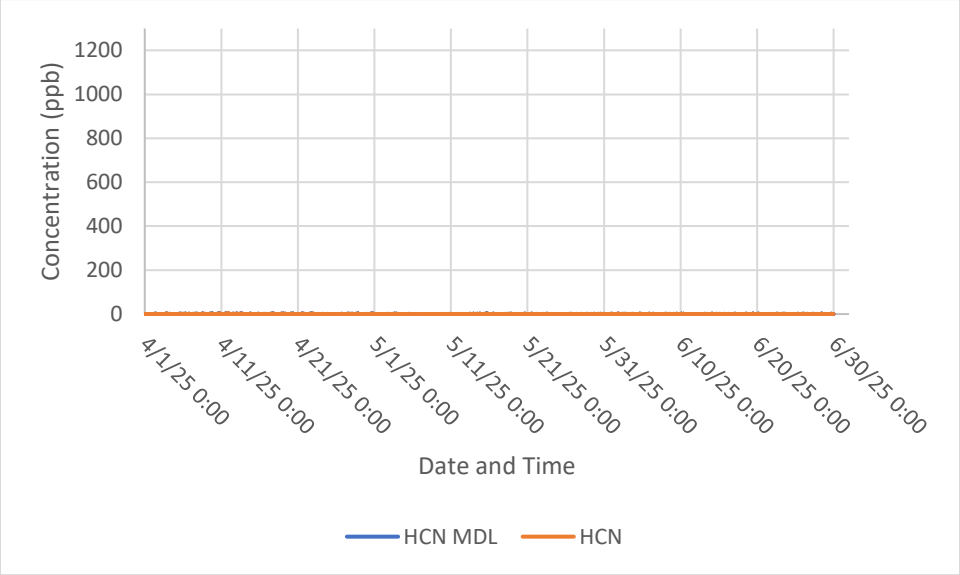

Figure 20. Timeseries of HCN Path 6

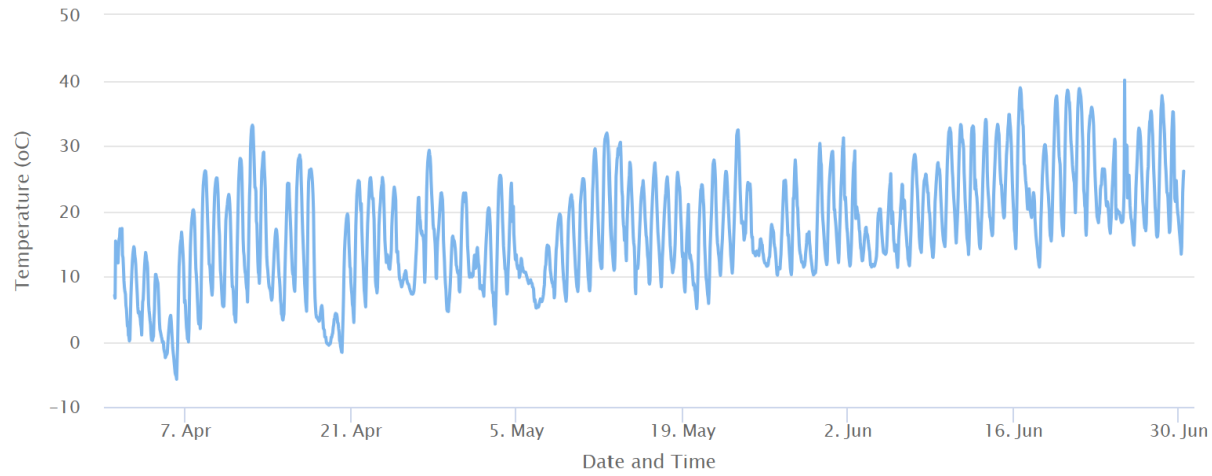

Figure 21. Temperature Timeseries (2025)

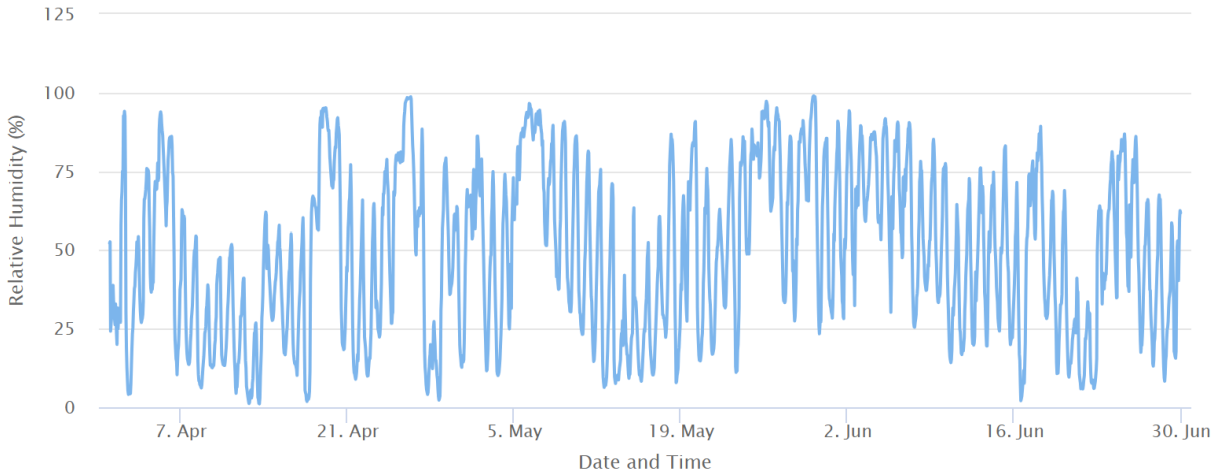

Figure 22. Relative Humidity Timeseries (2025)

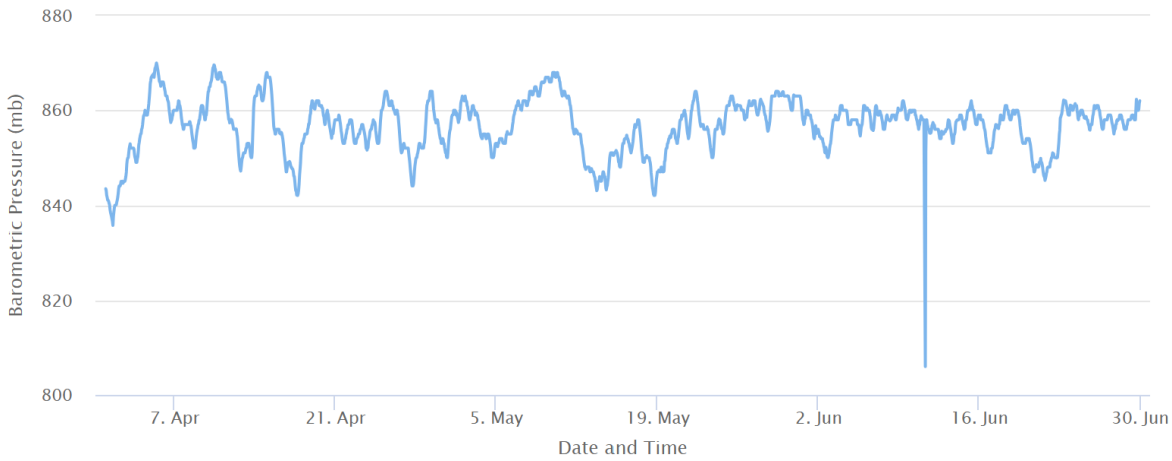

Figure 23. Barometric Pressure Timeseries (2025)

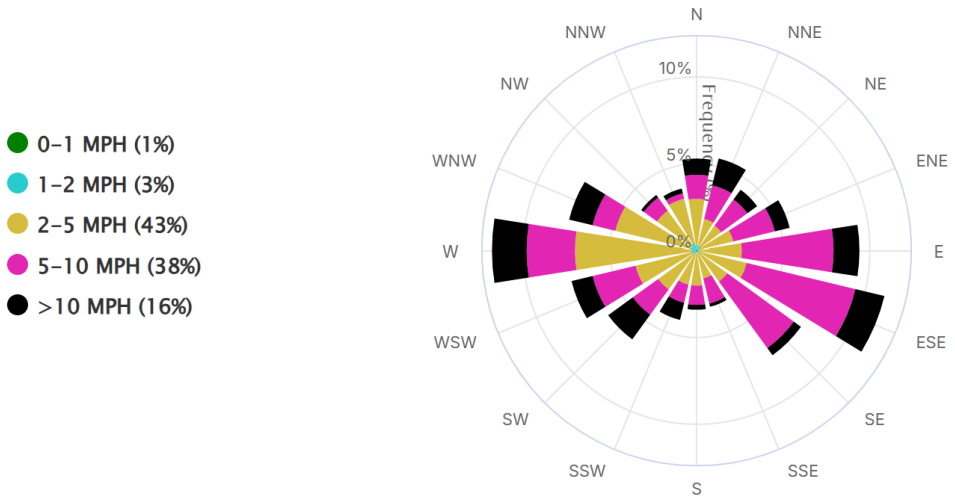

Figure 24. Wind Rose Plot

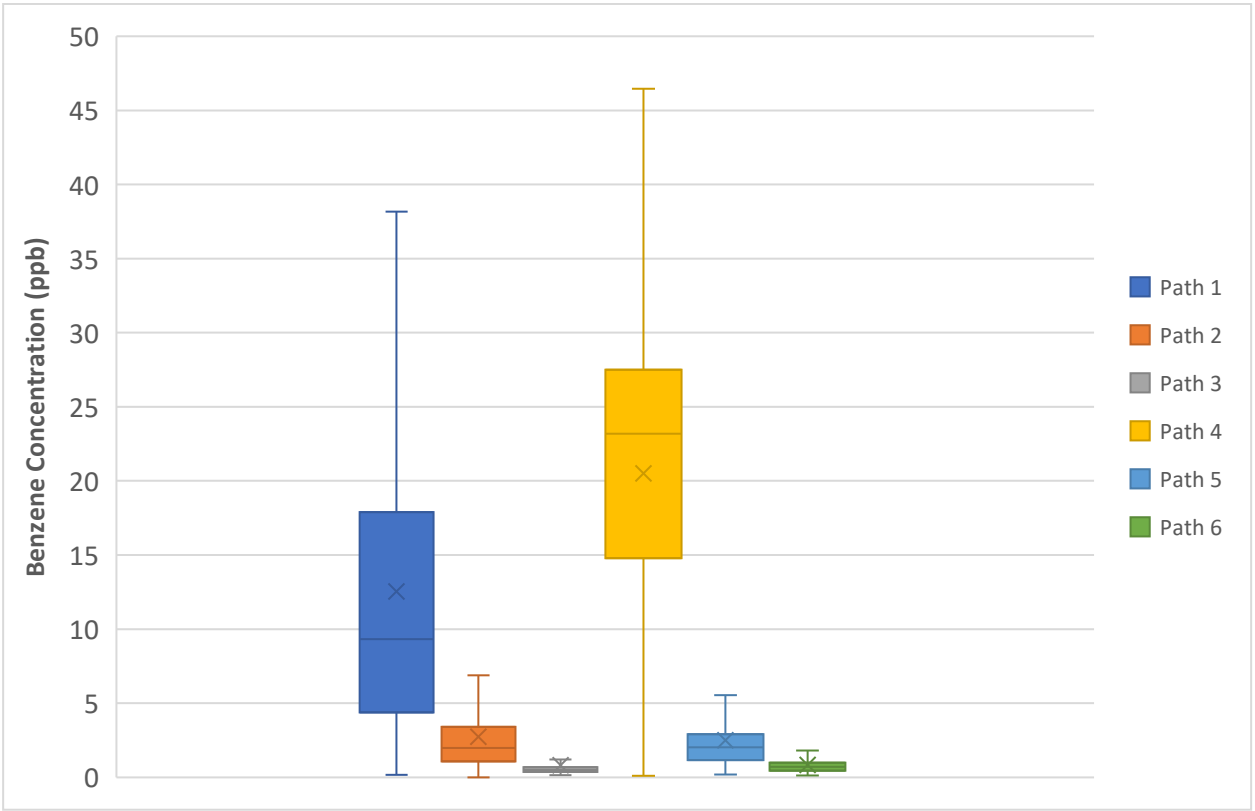

Figure 25. Benzene box plots for Paths 1 to 6.

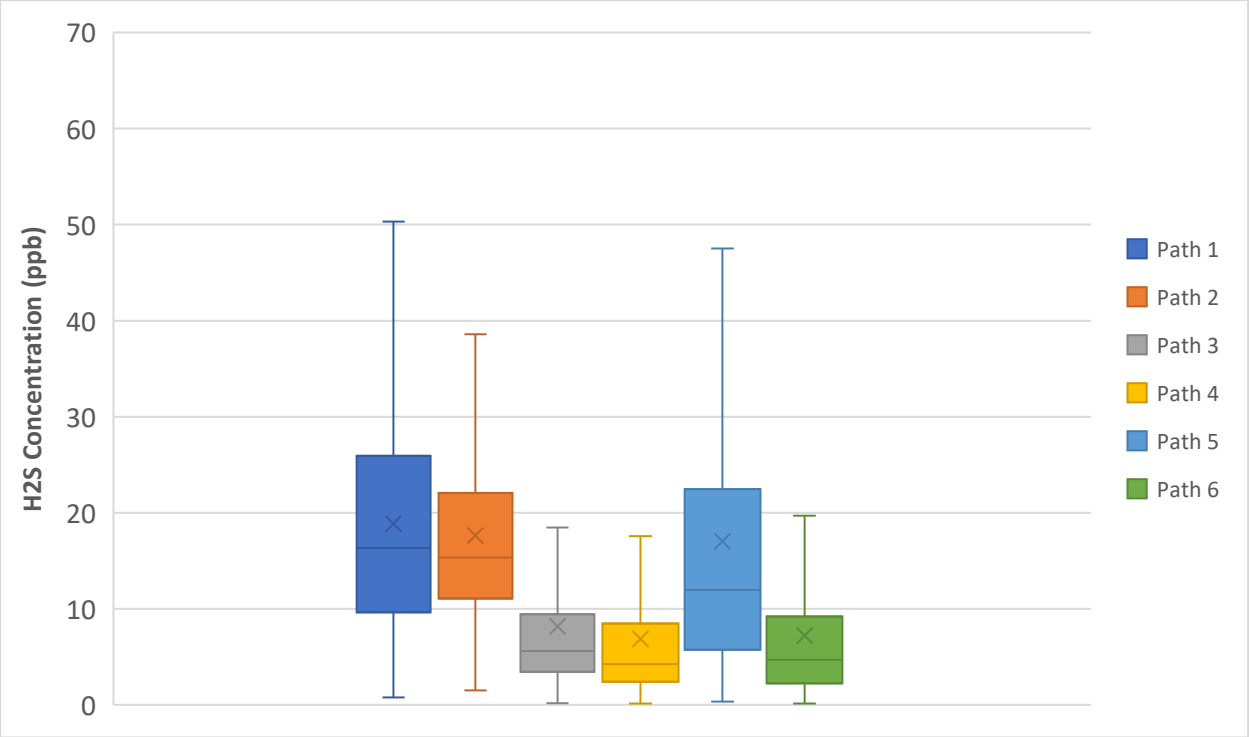

Figure 26. H_2S box plots for Paths 1 to 6.

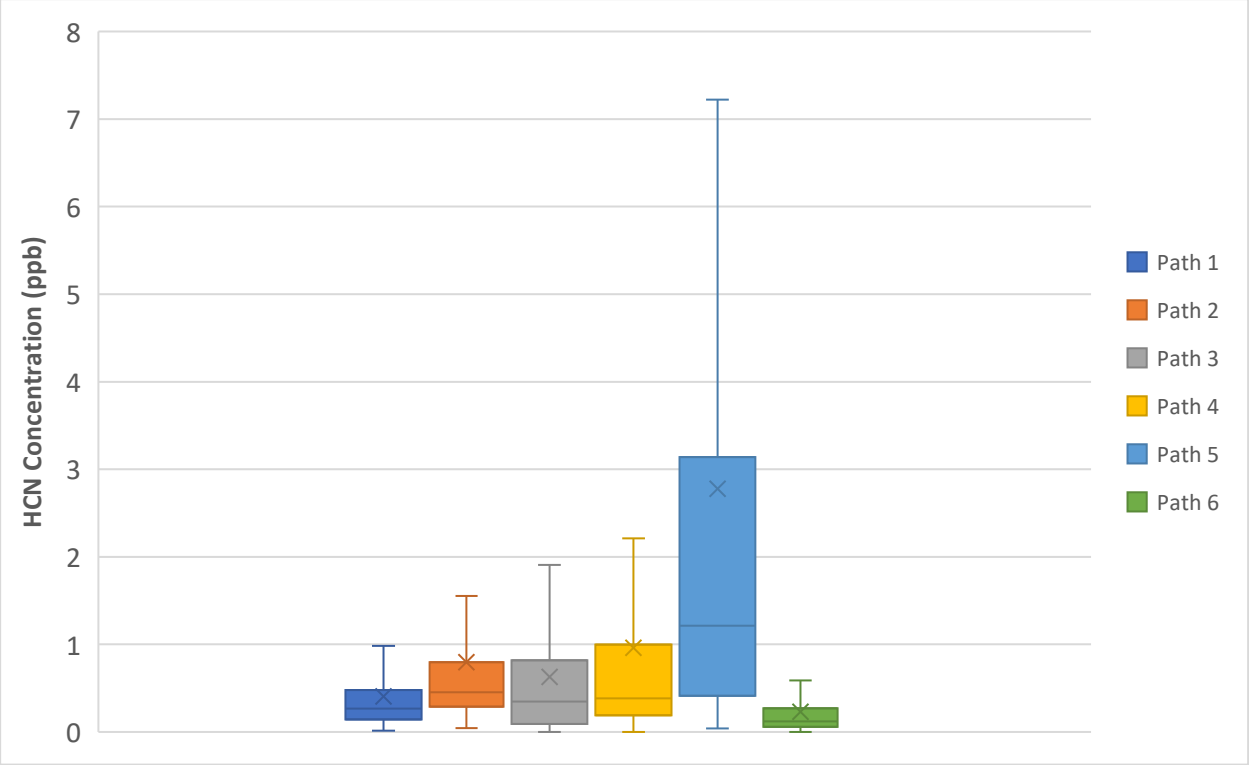

Figure 27. HCN box plots for Paths 1 to 6.

F. Discussion of Changes to Monitoring System, Operations and/or Procedures

Three main changes were performed to the fenceline monitoring plan procedures which are related with the automated QA/QC checks.

1. UV spectrometer temperature: the UV spectrometers were calibrated by the manufacturer at 35^{o}C instead of the 39^{o}C that the older models were used to be calibrated at. Thus, for the automated QA/QC checks, we changed the acceptance criteria to accommodate the updated spectrometer calibration conditions.
2. TDL signal intensity: the manufacturer recommended to monitor the absolute detector power instead of the signal intensity. The reason was related to the fact that the laser signal intensity is affected by multiple instrument parameters (I/O Gain, Signal Gain, signal collimation etc.). Due to these interferences, the signal intensity values that are reported by the analyzer could potentially not be representative of the actual signal power that is measured by the detector. To avoid these issues, we replaced the “signa intensity” parameter on the automated QA/QC checks with the parameter “absolute detector power”. The criteria for the data to be considered valid is the absolute detector power to be >0.1 mA.
3. H2S MDL: For the purposes of the data validation the H2S MDL threshold was increased from 25% to 50% of the alert threshold for Paths 2 and 5. This change was related to the fact that these two paths are shorter compared to the rest which causes them to have higher MDL values. The fenceline monitoring plan has been updated to reflect those changes and has been submitted to the Division for review.

VI. Appendices

A. Appendix A: Calibration and QA/QC Data

Table 7. Verification Activities

Date	Type of Verification	Path	Path Length[1]	Analyzer	Compound	Expected Concentration	Measured Concentration	Accuracy (%)	Precision (%)
6/24/2025	Bump test	1	588	UVDOAS	Benzene	100	100	4	5.2
6/24/2025	Bump test	1	588	UVDOAS	Benzene	200	194	3.6	3.8
6/24/2025	Bump test	2	566	UVDOAS	Benzene	100	93	6.8	1.5
6/24/2025	Bump test	2	566	UVDOAS	Benzene	200	179	10.2	1.99
6/25/2025	Bump test	3	613	UVDOAS	Benzene	100	105	13.4	15.3
6/25/2025	Bump test	3	613	UVDOAS	Benzene	200	198	3.5	4.4
6/16/2025	Bump test	4	566	UVDOAS	Benzene	100	97.6	18	24.3
6/16/2025	Bump test	4	566	UVDOAS	Benzene	200	203	9.1	11.5
6/16/2025	Bump test	5	594	UVDOAS	Benzene	100	110.4	10.8	9.8
6/16/2025	Bump test	5	594	UVDOAS	Benzene	200	187	8.3	8.1
6/16/2025	Bump test	6	569	UVDOAS	Benzene	100	105	16.6	20.5
6/16/2025	Bump test	6	569	UVDOAS	Benzene	200	218	10.8	9.1
6/19/2025	Audit Module	1	1116	TDL	H2S	500 ppmm	643	28.6	1.9
6/19/2025	Audit Module	1	1116	TDL	H2S	625 ppmm	673	7.7	3.3
6/19/2025	Audit Module	2	566	TDL	H2S	500 ppmm	462	7.5	3.4
6/19/2025	Audit Module	2	566	TDL	H2S	625 ppmm	609	2.6	0.98
6/19/2025	Audit Module	3	1226	TDL	H2S	500 ppmm	427	14.6	2.1
6/19/2025	Audit Module	3	1226	TDL	H2S	625 ppmm	558	10.7	1.6
6/19/2025	Audit Module	4	1132	TDL	H2S	500 ppmm	374	25.3	1.4
6/19/2025	Audit Module	4	1132	TDL	H2S	625 ppmm	510	18.5	0.6
6/19/2025	Audit Module	5	594	TDL	H2S	500 ppmm	654	30.9	2.3
6/19/2025	Audit Module	5	594	TDL	H2S	625 ppmm	534	14.5	0.9
6/19/2025	Audit Module	6	1138	TDL	H2S	500 ppmm	574	14.7	2
6/19/2025	Audit Module	6	1138	TDL	H2S	625 ppmm	653	1.2	1.6
6/19/2025	Audit Module	1	1116	TDL	HCN	1010 ppmm	969	4.1	0.1
6/19/2025	Audit Module	1	1116	TDL	HCN	420 ppmm	447	6.5	0.5
6/19/2025	Audit Module	2	566	TDL	HCN	1010 ppmm	976	3.4	0
6/19/2025	Audit Module	2	566	TDL	HCN	420 ppmm	447	6.4	0.3
6/19/2025	Audit Module	3	1226	TDL	HCN	1010 ppmm	983	2.7	0.1
6/19/2025	Audit Module	3	1226	TDL	HCN	420 ppmm	476	13.2	0.5
6/19/2025	Audit Module	4	1132	TDL	HCN	1010 ppmm	989	2.1	0.3
6/19/2025	Audit Module	4	1132	TDL	HCN	420 ppmm	478	13.7	0.6
6/19/2025	Audit Module	5	594	TDL	HCN	1010 ppmm	1014	0.5	0.5
6/19/2025	Audit Module	5	594	TDL	HCN	420 ppmm	476	13.2	0.4
6/19/2025	Audit Module	6	1138	TDL	HCN	1010 ppmm	979	3.1	0.1
6/19/2025	Audit Module	6	1138	TDL	HCN	420 ppmm	443	5.4	0.3

[1]path length in meters

Table 8: Percent Recovery for Meteorological Parameters

Parameter	Percent Data Recovery
Wind Speed	100%
Wind Direction	100%
Temperature	100%
Humidity	100%
Pressure	100%

B. Appendix B: Qualifier Codes

Table 9: List of Data Invalidation Codes

Qualifier Code	AQS Definition *(additional information added in parentheses)*	Type or Related Action
AB	Technician Unavailable. *(use if this affects scheduled QA/QC or necessary maintenance)*	Null Data Qualifier
AD	Shelter Storm Damage.	Null Data Qualifier
AG	Sample Time out of Limits. *(e.g., use if integration time is out of manufacturer recommended range and signal intensity and MDL cannot meet the critical criteria mentioned in the FLMP)*	Null Data Qualifier
AI	Insufficient Data. (cannot calculate)	Null Data Qualifier
AL	Voided by Operator. *(e.g., Datum rejected by data validators)*	Null Data Qualifier
AM	Miscellaneous Void.	Null Data Qualifier
AN	Machine Malfunction *(can be used for issues such as an instrument being out of alignment, or an analyzer being offline due to connection problems or instrument failure)*	Null Data Qualifier
AO	Bad Weather. *(Use if weather impacts open-path instrument operation/function)*	Null Data Qualifier
AP	Vandalism. *(Use if vandalism impacts open-path instrument operation/function)*	Null Data Qualifier
AQ	Collection Error. *(use specifically for low analyzer signal events, or when a low analyzer signal prevents the reported data from meeting the critical criteria, while the calculated MDL is lower than 25% of notification threshold)*	Null Data Qualifier
AT	Calibration.	Null Data Qualifier
AU	Monitoring Waived.	Null Data Qualifier
AV	Power Failure.	Null Data Qualifier
AW	Wildlife Damage. *(Use if damage impacts open-path instrument operation/function)*	Null Data Qualifier
AX	Precision Check.	Null Data Qualifier
AY	QC Control Points (zero/span).	Null Data Qualifier
AZ	QC Audit.	Null Data Qualifier
BA	Maintenance/Routine Repairs.	Null Data Qualifier
BH	Interference/co-elution/misidentification.	Null Data Qualifier
BJ	Operator Error.	Null Data Qualifier
BK	Site computer/data logger down.	Null Data Qualifier
BL	QA Audit.	Null Data Qualifier
BM	Accuracy check.	Null Data Qualifier
DA	Aberrant Data (Corrupt Files, Spikes, Shifts).	Null Data Qualifier
DL	Detection Limit Analyses.	Null Data Qualifier
EC	Exceeds Critical Criteria. *(use when data exceeds critical criteria, such as for MDL)*	Null Data Qualifier
IA	African Dust. *(use for any dust event)*	Informational
IT	Wildfire-U.S. *(use for any wildfire event)*	Informational
J	Construction/Repairs in Area.	Informational

LJ	Identification of Analyte Is Acceptable; Reported Value Is An Estimate.	Quality Assurance Qualifier
MD	Value less than MDL.	Quality Assurance Qualifier
NS	Influenced by nearby sources. **(e.g., in the event of emissions influenced by nearby sources)*	Quality Assurance Qualifier
QP	Pressure Sensor Questionable. **(e.g., use if cell pressure is out of range, indicating malfunction)*	Quality Assurance Qualifier
QT	Temperature Sensor Questionable. **(e.g., use if cell temperature is out of range, indicating malfunction)*	Quality Assurance Qualifier
QV	Quality Control Multi-point Verification.	Null Data Qualifier
QX	Does not meet QC criteria. **(e.g., data exceeds automatic criteria for rejection)*	Quality Assurance Qualifier
SC	Sampler Contamination.	Null Data Qualifier
ST	Calibration Verification Standard.	Null Data Qualifier
TC	Component Check & Retention Time Standard. **(use this code for additional instrument checks, e.g., a robustness tests)*	Null Data Qualifier

C. Appendix C: Field Data Sheets

2:00 PM 4/2/25 MONTROSE ONSITE CF

11:45 AM 4/10/2025 TC Montrose onsite

Aligned H2S ans HCN path 1

2:21 PM 4/15/2025 Montrose Onsite ML

Cleaned TDL reflectors and aligned TDL paths 1 & 2 H2S and HCN

11:06 AM 5/14/2025 Montrose Onsite ML

Checked alignment on H2S and HCN Path 1

12:54 PM 5/23/2025 Montrose Onsite ML

Aligned H2S and HCN path 1

1:45 PM 6/12/2025 Montrose Onsite ML

Aligned UV path 1

4:43 PM 6/16/2025 montrose onsite ml,cn

calibration

4:43 PM 6/24/2025 montrose onsite rc

audit and calibration

replaced bulbs uv 1-5

4:44 PM 6/25/2025 montrose onsite rc

calibration and audit

12:32 PM 4/15/2025 Montrose Onsite ML

Clenaed TDL reflectos and checked alignment on TDL H2S and HCN for paths 3 & 4

9:20 AM 5/15/2025 Montrose Onsite ML

Aligned UV path 4

11:06 AM 5/23/2025 Montrose Onsite ML

Aligned HCN path 4 and UV path 3

2:46 PM 6/16/2025 montrose onsite cn, ml, jg

calibrations

2:47 PM 6/24/2025 montrose onsite rc

calibration and audit

bulb replacement

1:16 PM 4/15/2025 Montrose Onsite ML

Cleaned TDL reflector and realigned H2S and HCN Path 5

11:37 AM 5/15/2025 Montrose Onsite ML

Aligned UV path 5

Aligned TDL H2S and HCN Path 6

1:35 PM 6/12/2025 Montrose Onsite ML

Offline troubleshooting

Aligned UV Path 5

4:49 PM 6/16/2025 montrose onsite jg,cn,ml

calibrations

4:49 PM 6/25/2025 montrose onsite rc

bulb replacement

audit

4:50 PM 6/25/2025 montrose onsite drew, cf

met station audit

alignments

D. Appendix D: Non-Conformance/Corrective Action Data Sheets

Non-Conformance Report

Project: PROJ-043815	**Month: February 2025**

LOCATION/SITE: Goodrich Corporation in Pueblo	**Parameter(s) Affected: Benzene, H2S and HCN Path 6**
Begin Date and Time (LST): 6/5/25 8:00PM	**End Date and Time (LST): 6/9/25 4:30PM**
Equipment: UVDOAS and TDLs Path 6	**S/N#: N/A**

Description of Malfunction or Problem: Make specific reference to Assignable Cause(s). All tests results should be documented on appropriate form(s).

A power outage in the area caused the instruments to shut down.

Investigative Actions: Describe Assignable Cause(s). Make specific reference to all dates, times and performance test results. All tests results should be documented on appropriate form(s).

Due to the power outage, the modem sim card in Shelter 6 was burnt and the modem settings were affected.

Corrective Action Taken: Make specific reference to all dates, times and performance test results.

A new sim card was installed and the systems went back online. No data loss was observed.

Is Problem Fully Resolved? **Yes __x__ No ____** If "NO", Describe Further Action Required: (File updated NC/CA Report when problem is fully resolved)

Additional Attachments or Information? **Yes ____ No__x__** Client Notified? **Yes __x__ no_____**If so, **date__6/5/25____**

Field Operator's Assessment of Data Status: (Check One)	☒ **Valid**	☐ **Suspect**	☐ **Invalid**

Additional notes on Data Validity Status: No data loss was observed.

Originator's Signature: **Katia Liangou**

QA Review: Aricia Boyd

Non-Conformance Report

Project: PROJ-043815	**Month: February 2025**

LOCATION/SITE: Goodrich Corporation in Pueblo	**Parameter(s) Affected: Benzene, H2S and HCN on Path 6 and Path 5**
Begin Date and Time (LST): 6/11/25 4:00AM	**End Date and Time (LST): 6/11/25 10:00AM**
Equipment: UVDOAS and TDLs on Path 6 and Path 5	**S/N#: N/A**

Description of Malfunction or Problem: Make specific reference to Assignable Cause(s). All tests results should be documented on appropriate form(s).

A power outage in the area caused the instruments to shut down.

Investigative Actions: Describe Assignable Cause(s). Make specific reference to all dates, times and performance test results. All tests results should be documented on appropriate form(s).

A Black Hills fuse malfunction caused the power outage. The power outage affected all instruments in Shelter 6.

Corrective Action Taken: Make specific reference to all dates, times and performance test results.

Goodrich contacted Black Hills and they fixed the issue.

Is Problem Fully Resolved? **Yes** **x** **No** _____ If "NO", Describe Further Action Required: (File updated NC/CA Report when problem is fully resolved)

Additional Attachments or Information? **Yes** _____ **No** **x** Client Notified? **Yes** **x** **no** _____ If so, **date** **6/11/25**

Field Operator's Assessment of Data Status: (Check One)	☒ **Valid**	☐ **Suspect**	☒ **Invalid**

Additional notes on Data Validity Status: No data was collected during power outage.

Originator's Signature: **Katia Liangou**

QA Review: Aricia Boyd

E. Appendix E: Calibration verification forms

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	558 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	500	640	28
2	500	640	28
3	500	640	28
4	500	660	32
5	500	636	27.2
Averages	500	643	28.6

	Calculated Values	Expected Values
Overall Percent Precision	98.1%	**≥ 80%**
Overall Percent Error	28.6%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/2025

Instrument Model: H2S Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	558 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	625	666	6.6
2	625	656	5
3	625	696	11.4
4	625	654	4.6
5	625	694	11
Averages	625	673	7.7

	Calculated Values	Expected Values
Overall Percent Precision	96.7 %	**≥ 80%**
Overall Percent Error	7.7 %	**≤ 30%**

Montrose Air Quality Services
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TDL Calibration Form

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Notes:
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Operator Signature(s):  Witness Signature(s): James Garrett

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/2025

Instrument Model: H2S Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	283 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	500	474	5.2
2	500	476	4.8
3	500	464	7.2
4	500	464	7.2
5	500	434	13.2
Averages	500	462	7.5

	Calculated Values	**Expected Values**
Overall Percent Precision	96.6%	**≥ 80%**
Overall Percent Error	7.5%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
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Operator Signature(s):  Witness Signature(s): James Garrett

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/2025

Instrument Model: H2S Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	283 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	625	604	3.3
2	625	608	2.7
3	625	616	1.4
4	625	614	1.8
5	625	602	3.7
Averages	625	609	2.6

	Calculated Values	Expected Values
Overall Percent Precision	99.02	**≥ 80%**
Overall Percent Error	2.6	**≤ 30%**

TDL Calibration Form

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	613 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	500	428	14.4
2	500	430	14
3	500	438	12.4
4	500	428	14.4
5	500	410	18
Averages	500	427	14.6

	Calculated Values	**Expected Values**
Overall Percent Precision	97.9%	**≥ 80%**
Overall Percent Error	14.6%	**≤ 30%**

TDL Calibration Form

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Notes:
Calibration verification passed.

Operator Signature(s): _____ Witness Signature(s): James Garrett

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/2025

Instrument Model: H2S Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	613 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	625	542	13.3
2	625	570	8.8
3	625	560	10.4
4	625	560	10.4
5	625	558	10.7
Averages	625	558	10.7

	Calculated Values	Expected Values
Overall Percent Precision	98.4 %	**≥ 80%**
Overall Percent Error	10.7 %	**≤ 30%**

TDL Calibration Form

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

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Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	566 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	500	372	25.6
2	500	378	24.4
3	500	380	24
4	500	376	24.8
5	500	362	27.6
Averages	500	374	25.3

	Calculated Values	**Expected Values**
Overall Percent Precision	98.6%	**≥ 80%**
Overall Percent Error	25.3%	**≤ 30%**

TDL Calibration Form

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Notes:
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Operator Signature(s):  Witness Signature(s): James Garrett

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www.montrose-env.com

TDL Calibration Form

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Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	566 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	625	514	17.8
2	625	510	18.4
3	625	512	18.1
4	625	504	19.4
5	625	508	18.7
Averages	625	510	18.5

	Calculated Values	**Expected Values**
Overall Percent Precision	99.4%	**≥ 80%**
Overall Percent Error	18.5%	**≤ 30%**

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	297 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	500	664	32.8
2	500	638	27.6
3	500	666	33.2
4	500	654	30.8
5	500	650	30
Averages	500	654	30.9

	Calculated Values	Expected Values
Overall Percent Precision	97.7%	**≥ 80%**
Overall Percent Error	30.9%	**≤ 30%**

TDL Calibration Form

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Operator Signature(s):  Witness Signature(s): James Garrett

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	297 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	625	540	13.6
2	625	540	13.6
3	625	528	15.5
4	625	532	14.9
5	625	532	14.9
Averages	625	534	14.5

	Calculated Values	**Expected Values**
Overall Percent Precision	99.1%	**≥ 80%**
Overall Percent Error	14.5%	**≤ 30%**

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	569 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	500 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	500	560	12
2	500	580	16
3	500	586	17.2
4	500	570	14
5	500	572	14.4
Averages	500	574	14.7

	Calculated Values	**Expected Values**
Overall Percent Precision	98 %	**≥ 80%**
Overall Percent Error	14.7%	**≤ 30%**

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Notes:
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Operator Signature(s): 

Witness Signature(s): James Garrett

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: H2S Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	569 m
Compound (H2S/HCN)	H2S

Standard Information	
Compound External Audit Cell Concentration (PPMM)	625 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	625	618	1.1
2	625	634	1.4
3	625	628	0.5
4	625	626	2
5	625	608	3
Averages	625	623	1

	Calculated Values	**Expected Values**
Overall Percent Precision	98.4%	**≥ 80%**
Overall Percent Error	1.2%	**≤ 30%**

TDL Calibration Form

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	558 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	420	450	7.1
2	420	444	5.7
3	420	446	6.2
4	420	448	6.7
5	420	448	6.7
Averages	420	447	6.5

	Calculated Values	Expected Values
Overall Percent Precision	99.5%	**≥ 80%**
Overall Percent Error	6.5%	**≤ 30%**

TDL Calibration Form

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	558 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	1010	968	4.2
2	1010	968	4.2
3	1010	970	4
4	1010	970	4
5	1010	968	4.2
Averages	1010	969	4.1

	Calculated Values	Expected Values
Overall Percent Precision	99.9%	**≥ 80%**
Overall Percent Error	4.1%	**≤ 30%**

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	283 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	420	448	6.7
2	420	446	6.2
3	420	446	6.2
4	420	446	6.2
5	420	448	6.7
Averages	420	447	6.4

	Calculated Values	**Expected Values**
Overall Percent Precision	99.7%	**≥ 80%**
Overall Percent Error	6.4%	**≤ 30%**

TDL Calibration Form

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Notes:
Calibration verification passed.

Operator Signature(s): 

Witness Signature(s): James Garrett

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	283 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	1010	976	3.4
2	1010	976	3.4
3	1010	976	3.4
4	1010	976	3.4
5	1010	976	3.4
Averages	1010	976	3.4

	Calculated Values	**Expected Values**
Overall Percent Precision	100%	**≥ 80%**
Overall Percent Error	3.4%	**≤ 30%**

TDL Calibration Form

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Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

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Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	613 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	420	472	12.4
2	420	476	13.3
3	420	478	13.8
4	420	476	13.3
5	420	476	13.3
Averages	420	476	13.2

	Calculated Values	**Expected Values**
Overall Percent Precision	99.5%	**≥ 80%**
Overall Percent Error	13.2%	**≤ 30%**

TDL Calibration Form

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	613 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	1010	982	2.8
2	1010	984	2.6
3	1010	982	2.8
4	1010	984	2.6
5	1010	984	2.6
Averages	1010	983	2.7

	Calculated Values	Expected Values
Overall Percent Precision	99.9%	**≥ 80%**
Overall Percent Error	2.7%	**≤ 30%**

TDL Calibration Form

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Notes:
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Operator Signature(s):  Witness Signature(s): James Garrett

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Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	566 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	**Compound Concentration (PPMM)**	**Measured Concentration (PPMM)**	**Error (% Reading)**
1	420	478	13.8
2	420	474	12.9
3	420	480	14.3
4	420	476	13.3
5	420	480	14.3
Averages	420	478	13.7

	Calculated Values	**Expected Values**
Overall Percent Precision	99.4%	**≥ 80%**
Overall Percent Error	13.7%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	566 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	1010	986	2.4
2	1010	990	2
3	1010	992	1.8
4	1010	992	1.8
5	1010	986	2.4
Averages	1010	989	2.1

	Calculated Values	Expected Values
Overall Percent Precision	99.7%	**≥ 80%**
Overall Percent Error	2.1%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	297 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	420	476	13.3
2	420	478	13.8
3	420	476	13.3
4	420	474	12.9
5	420	474	12.9
Averages	420	476	13.2

	Calculated Values	Expected Values
Overall Percent Precision	99.6%	**≥ 80%**
Overall Percent Error	13.2%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	297 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	1010	1006	0.4
2	1010	1016	0.6
3	1010	1018	0.8
4	1010	1014	0.4
5	1010	1014	0.4
Averages	1010	1014	0.5

	Calculated Values	Expected Values
Overall Percent Precision	99.5%	**≥ 80%**
Overall Percent Error	0.5%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s): 

Witness Signature(s): 

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TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	569 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	420 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	420	442	5.2
2	420	444	5.7
3	420	444	5.7
4	420	442	5.2
5	420	442	5.2
Averages	420	443	5.4

	Calculated Values	Expected Values
Overall Percent Precision	99.7%	**≥ 80%**
Overall Percent Error	5.4%	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/19/25

Instrument Model: HCN Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path separation(meters-one-way)	569 m
Compound (H2S/HCN)	HCN

Standard Information	
Compound External Audit Cell Concentration (PPMM)	1010 PPMM

File #	Compound Concentration (PPMM)	Measured Concentration (PPMM)	Error (% Reading)
1	1010	980	3
2	1010	978	3.2
3	1010	978	3.2
4	1010	980	3
5	1010	980	3
Averages	1010	979	3.1

	Calculated Values	Expected Values
Overall Percent Precision	99.9%	**≥ 80%**
Overall Percent Error	3.1 %	**≤ 30%**

TDL Calibration Form

Form Title: TDL Calibration Form	**Implementation Date:** August 8, 2024
Document Number: 331AA-OPS-FM-15	**Form Owner (Department):** MAQS
Revision Number: Rev. 1	**Form Approval:** Katia Liangou

Notes:
Calibration verification passed.

Operator Signature(s):  Witness Signature(s): James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/24/25

Instrument Model: UV Bi Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	613 m/ 0.00235m
Maximum Intensity (%)	82
Integration Time (ms)	30

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	97	3
2	100	100	0
3	100	105	5
4	100	93	7
5	100	105	5
Averages	100	100	4

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	94.8	**≥ 75%**
Overall Percent Error	4	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/24/25

Instrument Model: UV Bi Path 1 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	613 m/ 0.0235m
Maximum Intensity (%)	82
Integration Time (ms)	30

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	194	3
2	200	191	4.5
3	200	184	8
4	200	199	0.5
5	200	204	2
Averages	200	194	3.6

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	96.2	**≥ 75%**
Overall Percent Error	3.6	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/24/25

Instrument Model: UV Mono Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	566 m/ 0.047m
Maximum Intensity (%)	81
Integration Time (ms)	41

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	91	9
2	100	94	6
3	100	93	7
4	100	93	7
5	100	95	5
Averages	100	93	6.8

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	98.5	**≥ 75%**
Overall Percent Error	6.8	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/24/25

Instrument Model: UV Mono Path 2 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	566 m/ 0.047m
Maximum Intensity (%)	81
Integration Time (ms)	41

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	183	8.5
2	200	174	13
3	200	183	8.5
4	200	177	11.5
5	200	181	9.5
Averages	200	179	10.2

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	98.01	**≥ 75%**
Overall Percent Error	10.2	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/25/25

Instrument Model: UV Bi Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	613 m/ 0.0235m
Maximum Intensity (%)	75
Integration Time (ms)	24

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	79	21
2	100	104	4
3	100	112	12
4	100	113	13
5	100	117	17
Averages	100	105	13.4

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	84.7	**≥ 75%**
Overall Percent Error	13.4	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/25/25

Instrument Model: UV Bi Path 3 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	613 m/ 0.0235m
Maximum Intensity (%)	75
Integration Time (ms)	24

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	186	7
2	200	202	1
3	200	206	3
4	200	204	2
5	200	191	4.5
Averages	200	198	3.5

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	95.6	**≥ 75%**
Overall Percent Error	3.5	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/2025

Instrument Model: UV Bi Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	566 m/ 0.0235m
Maximum Intensity (%)	97
Integration Time (ms)	53

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	102	2
2	100	123	23
3	100	114	14
4	100	88	12
5	100	61	39
Averages	100	97.6	18

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	75.7	**≥ 75%**
Overall Percent Error	18	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/2025

Instrument Model: UV Bi Path 4 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	566 m/ 0.0235m
Maximum Intensity (%)	97
Integration Time (ms)	53

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	228	14
2	200	171	14.5
3	200	204	2
4	200	191	4.5
5	200	221	10.5
Averages	200	203	9.1

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	88.5	**≥ 75%**
Overall Percent Error	9.1	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

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Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/25

Instrument Model: UV Mono Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	594 m/ 0.047m
Maximum Intensity (%)	87
Integration Time (ms)	95

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	102	2
2	100	123	23
3	100	115	15
4	100	99	1
5	100	113	13
Averages	100	110.4	10.8

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	90.2	**≥ 75%**
Overall Percent Error	10.8	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/25

Instrument Model: UV Mono Path 5 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	594 m/ 0.047m
Maximum Intensity (%)	87
Integration Time (ms)	95

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	205	2.5
2	200	177	11.5
3	200	178	11
4	200	205	2.5
5	200	172	14
Averages	200	187	8,3

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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	91.9	**≥ 75%**
Overall Percent Error	8.3	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

Montrose Air Quality Services
5120 Northshore Dr. North Little Rock, AR 72218
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www.montrose-env.com

UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/25

Instrument Model: UV Bi Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	569 m/ 0.0235m
Maximum Intensity (%)	94
Integration Time (ms)	35

Standard Information	
Benzene Standard Concentration (PPM)	100

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	100	119	19
2	100	117	17
3	100	99	1
4	100	117	17
5	100	71	29
Averages	100	105	16.6

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	79.5	**≥ 75%**
Overall Percent Error	16.6	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

Montrose Air Quality Services
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UVDOAS Calibration Form

Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

Operator Name(s): Katia Liangou Test Date (YYYY/MM/DD): 6/16/25

Instrument Model: UV Bi Path 6 Instrument Serial Number: _____

Instrument Parameters	
Optical Path Length (meters)	569 m/ 0.0235m
Maximum Intensity (%)	94
Integration Time (ms)	35

Standard Information	
Benzene Standard Concentration (PPM)	200

File #	**Benzene Concentration (PPM)**	**Measured Concentration (PPM)**	**Error (%)**
1	200	234	17
2	200	217	8.5
3	200	213	6.5
4	200	234	17
5	200	190	5
Averages	200	218	10.8

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Form Title: UVDOAS Calibration Form	**Implementation Date:** July 10, 2024
Document Number: 331AA-OPS-FM-13	**Form Owner (Department):** MAQS
Revision Number: Rev. 0	**Form Approval:** Katia Liangou

	Calculated Values	**Expected Values**
Overall Percent Precision	90.9	**≥ 75%**
Overall Percent Error	10.8	**≤ 30%**

Notes:
Calibration verification passed.

Operator's Signature Katia Liangou

Witness's Signature James Garrett

Form Title: Audit Checklist **Implementation Date:** July 07, 2025
Document Number: 317AA-OPS-FM25 **Form Owner (Department):** MAQS **Revision Number:** R0 **Form Approval:** KLiangou

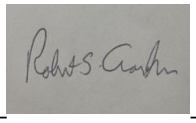
Audit Checklist

Business Name: ____Collins , Pueblo CO_____
Audit Period: __June 2025 on site plus historical data_____
Auditor's Name: ____Robert S. Crampton Ph.D._____
Date: _____August 12 / 2025_____

Audit Instruments:
Cerex UV D.O.A.S. Benzene monitors

Task	Passed/Failed	Comments
Check if instruments are operational	Passed	
Check if data is collected	Passed	
Check if scripts are running correctly	Passed	
Check if instruments are aligned	Passed	Minor adjustments from good to better
Check calibration verification	Passed	
Check housekeeping	Passed	
Check historical data	Passed	
Check instrument parameters (e.g. laser, UV bulb etc.)	Passed	Replaced bulbs /improved sig
Check if additional maintenance is required	No	

Comments:__
_All units Had UV signal to noise level to perform as designed and responded within Spec to bump tests _____

Auditor's Signature: ____  _____

MONTROSE
AIR QUALITY SERVICES

Station Monitoring Log

Project: Goodrich - Collins Aerospace

Station ID: Pueblo Met 1
Operator: Andrew Boxell
Purpose of Visit: Semi-annual met audit

Date: June 25, 2025
Time In: 10:00 am
Time Out: 11:30 am

Sensor Check

- [x] Anemometers
- [ ] Aspirator Fans
- [ ] Net Rad.
- [ ] Precip
- [x] Pressure
- [ ] Solar Rad.
- [ ] Tower
- [x] Solar Panels
- [x] Temp/RH-Radiation Shields
- [x] Wind Vanes
- [ ] Other _____

Datalogger Check

Current Program _____

Datalogger Clock-

Time: _____
Year: _____
Day: _____

Clock Reset? (Criteria +/- 5 Minutes)
YES ○
NO ○

Parameter Value and Unit

- [ ] PV Battery Enclosure Check
- [ ] PV Battery Voltage Check

Activities

Perform semi-annual met audit

No ☐ **Yes** ☒ **Site Operational Upon Leaving?** (Note any issues or failures detected) _____

Parts/Supplies Needed: _____

Montrose Air Quality Services, LLC
A Division of Montrose Environmental Group
3500 Comanche Road NE Suite G
Albuquerque, NM 87107-4546

T: 505.830.9680 ext. 11700
F: 505.830.9678
Email: sales@montrose-env.com
www.montrose-env.com

MONTROSE
AIR QUALITY SERVICES

Wind Speed Audit Log

60 Meter 10 Meter 2 Meter Other

Client: Goodrich Corp.	Site: Pueblo Met 1	Date: June 25, 2025	
Sensor Manufacturer: MetOne	Height: 3m	Model: 010C	S/N: D16127
Start Time: 10:50 am	Stop Time: 11:00 am		

Bearing Check			Torque Watch Manufacturer:
Clockwise: < 0.2	Counter Clockwise: < 0.2	Acceptable Reading:	≤ 0.216

Synchronous Motor Test

RPM	AC Frequency of Motor	Sensor Output (volts)	Sensor Output (m/s)	Expected Output (m/s)	Percent Difference (sensor-exp)/exp
0.0			0.27	0.27	0
100					
300					
600			16.27	16.27	0
900			24.27	24.27	0
1200					
1500					
1800				~~48.27~~	

Synchronous Motor

Manufacturer:	Model No.:	S/N:	Date of Last Calibration:
RM Young	18802	CA3616	May 19, 2025

Data Verification Test

Datalogger Time of Test (MST)	Max Wind Speed Audit	Max Wind Speed Database	Verified By

Auditor Comments and Notes

Signature: _____

MONTROSE
AIR QUALITY SERVICES

Wind Direction Audit Log

60 Meter 10 Meter 2 Meter Other

Client: Goodrich Corp	Site: Pueblo Met 1		Date: June 25, 2025
Sensor Manufacturer: MetOne	Height: 3m	Model: 020D	S/N: D16687
Start Time: 10:30 am	Stop Time: 11:00 am		
Bearing Check	Torque Watch Manufacturer: RM Young		
Clockwise: < 5.0	Counter Clockwise: < 5.0	Acceptable Reading:	≤ 6.45

Solar Reference/Azimuth Check

Reference Point	Compass Degrees (Add Mag. Decl.)	Sensor Output (Degrees)	Solar Angle/Azimuth (Degrees)	Degrees Difference
Cross Arm Align.	360/0	360/0		0
	180	178		-2

Sigma Theta Test

Datalogger Start Time:	Sensor Output:	Wheel Output:	
Datalogger Stop Time:	Sensor Output:	Wheel Output:	
Sigma Theta Sensor:	Sigma Theta Calc:	Avg. WD Sensor:	Avg WD Calc:

Linearity Check

Dial	Degrees	Delta Degrees	Dial	Degrees	Delta Degrees
0	0.2	—	210	207.4	+0.3
30	27.9	-3.3	240	238.0	+1.6
60	57.3	-0.6	270	268.1	+0.1
90	88.1	+0.8	300	299.7	+1.6
120	117.5	-0.6	330	330.2	+0.5
150	147.1	-0.4	360	0.2	0
180	177.1	0	r = 0.999	m = 1.0041	b = -2.3612

Data Verification Check		Verified By:	
Datalogger Start Time (MST)	Datalogger Stop Time (MST)	Avg. Wind Direction Sensor	Avg. Wind Direction Database

Auditor Comments and Notes

Signature: _____

MONTROSE
AIR QUALITY SERVICES

Temperature Co-Located Audit Log

60 Meter 10 Meter 2 Meter Other

Client: Goodrich Corp.	Site: Pueblo Met 1	Date: June 25, 2025	
Sensor Manufacturer: MetOne	Height: 2m	Model: 065	S/N: 15976
Start Time: 10:15 am	Stop Time: 11:30 am		
Field Thermometer Manufacturer: Brooklyn 66060-FL & 1075			

Co-Located Test				
	Repetition #1	**Repetition #2**	**Repetition #3**	**Repetition #4**
Time	10:27	11:03	11:22	
Co-Located NIST Thermometer °C (A)	52.0	27.1	24.8	
Sensor Output °C (B)	52.0	27.1	24.8	
Difference °C (B-A)	0	0	0	

Data Verification Test		**Verified By:**	
Start Time (MST)	Stop Time (MST)	Audit Temperature (°C)	Database Temperature (°C)

Auditor Comments and Notes

Signature: _____

MONTROSE
AIR QUALITY SERVICES

Relative Humidity Co-Located Audit Log

60 Meter 10 Meter 2 Meter Other

Client: Goodrich Corp	Site: Pueblo Met 1	Date: June 25, 2025	
Sensor Manufacturer: MetOne	Height: 2m	Model: 083F	S/N: 14161
Start Time: 10:15 am	Stop Time: 11:30 am		

Co-Located Test

	Repetition #1	Repetition #2	Repetition #3	Repetition #4
Time	10:27 am	11:03 am	11:22 am	
Co-Located NIST Relative Humidity % (A)	52.7	53.1	54.6	
Sensor Output % (B)	54.6	52.0	55.7	
Difference % (B-A)	1.9	-1.1	0.9	

Does temperature sensor contain a motorized Aspirator: ☑ Yes ○ No ○ N/A
If no, explain:

Time Averaged Test

Start Time	End Time	Audit Average RH %	Sensor Average RH %	Measured Difference %

Auditor Notes and Comments

Signature: _____

MONTROSE AIR QUALITY SERVICES

Barometric Pressure Audit Log

Client: Goodrich Corp	Site: Pueblo Met 1	Date: June 25, 2025	
Sensor Manufacturer: MetOne	Height: 2m	Model: 092	S/N: 618609

NIST Barometer Comparison		
Field Barometer Manufacturer: Meriam	Model: NM200N	S/N: 250100018
Date of last comparison to NIST Barometer: January 6, 2025		

Co-Located Ambient Test

Time	Audit Pressure (A)	Sensor Pressure (B)	Absolute Difference
10:27	857.7	857.8	0.1
11:03	857.4	857.4	0
11:22	857.5	857.5	0
			0
			0

Auditor Calculations

Auditor Comments and Notes

Signature: Andrew Rapp

Certification - Selectable Speed Anemometer

Certificaton Type	Owner	Performed By	Certificaton Date	Temp	RH
Select Speed Anemom	Montrose	ALDAVIDS	May 19, 2025	71.6	37.6

Transfer Standard

Serial Number	Brand	Model	Range
CA3616	Young	18802	

Primary Standard

Serial Number	Brand	Model
20901074	AMETEK	1726

Certification Data

Run 1				Run 2				Transfer Std Setpoint	Transfer Std MPH	Enter a Conversion factor for Young Model 18802 RPM to MPH
CW		CCW		CW		CCW				
Primary (x)	Transfer (y)	Primary (x)	Transfer (y)	Primary (x)	Transfer (y)	Primary (x)	Transfer (y)			
200	200	200	200	200	200	200	200	200	2.2	0.01096
600	600	600	600	600	600	600	600	600	6.6	
1000	1000	1000	1000	1000	1000	1000	1000	1000	11.0	
2000	2000	2000	2000	2000	2000	2000	2000	2000	21.9	
5000	5000	5000	5000	5000	5000	5000	5000	5000	54.8	
10000	10000	10000	10000	10000	10000	10000	10000	10000	109.6	
14999	14999	14999	14999	14999	14999	14999	14999	15000	164.4	

Recertification is Due: May 19, 2026

Conversion Factors
mph = rpm * 0.01096
mph = rpm * 0.01145

ISO 9001:2015
Certifed By
UL DQS
10001297 QM15

Certificate of Calibration

TEST # 50219-C01
ITEM # 63491

ISSUED BY

MCS Calibration, Inc.

1533 LINCOLN AVENUE HOLBROOK, NEW YORK 11741
(631) 471-6900 FAX (631) 471-6902

CUSTOMER MONTROSE AIR QUALITY SERVICES, LLC
DESCRIPTION THERMOMETER / DIGITAL
MFR. BROOKLYN
MODEL 6660-FC & 1075
RANGE -40 TO 300 DEG F (-40 TO 150 DEG C)

Calibration Date 2/21/2025
Calibration Due 2/21/2026
PO # CALL FOR CC
S/N 341242 & 9014/0199
ID #

This certificate was prepared by MCS Calibration, Inc. in compliance with MIL-STD-45662A, ANSI/NCSL Z540 & ISO 9001. This instrument was calibrated using test equipment whose accuracy is traceable through the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY or accepted values of natural physical constants, to the International System of Units(SI units).This instrument has been added to the MCS RECALIBRATION PROGRAM.
 This instrument was calibrated at MCS's facility "MCS CERTIFIES THAT THE REQUIREMENTS OF THE PURCHASE ORDER HAVE BEEN MET."

TEST DATA

DEGREES READS	DEGREES ACTUAL
-0.1	0.00
20.0	20.00
34.9	35.00

ALL TEMPERATURES ARE GIVEN IN DEGREES CENTIGRADE (DEG C)

REQUIRED ACCURACY: +/- 0.5% OF READING or +/- 0.2C (MFR)

SERVICE NOTE: THIS UNIT MEETS THE REQUIRED ACCURACY, "AS FOUND, AS LEFT"

ENVIRONMENTAL CONDITIONS
72 DEG F
30 % RH

Quality Manual Rev. 25

PROCEDURE MCS2046 rev. 02
CYCLE 12
BY PA

MCS TRACEABILITY

MCS ITEM #	EQUIPMENT USED	TRACEABILITY #	CURRENTLY DUE
49585	THERMOMETER / SUPER / DIGITAL	31023-Z02	10/23/2026
78284	RTD TEMPERATURE PROBE / PLATINUM	40627-Z01	9/26/2028

Q.A. MCS

VALID ONLY WHEN APPROVED BY MCS QUALITY ASSURANCE PERSONNEL

ISO 9001:2015
Certifed By
UL DQS
10001297 QM15

Certificate of Calibration

TEST # 50219-C03
ITEM # 134351

ISSUED BY

MCS Calibration, Inc.

1533 LINCOLN AVENUE HOLBROOK, NEW YORK 11741
(631) 471-6900 FAX (631) 471-6902

CUSTOMER MONTROSE AIR QUALITY SERVICES, LLC
DESCRIPTION HYGRO / THERMOMETER / DIGITAL
MFR. VAISALA
MODEL HM41 / HMP113
RANGE 0-120 DEG F, 0-100 % RH

Calibration Date 2/21/2025
Calibration Due 2/21/2026
PO # CALL FOR CC
S/N P1010693 / P0760115
ID #

This certificate was prepared by MCS Calibration, Inc. in compliance with MIL-STD-45662A, ANSI/NCSL Z540 & ISO 9001. This instrument was calibrated using test equipment whose accuracy is traceable through the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY or accepted values of natural physical constants, to the International System of Units(SI units).This instrument has been added to the MCS RECALIBRATION PROGRAM.
 This instrument was calibrated at MCS's facility "MCS CERTIFIES THAT THE REQUIREMENTS OF THE PURCHASE ORDER HAVE BEEN MET."

TEST DATA

% RH READS	% RH ACTUAL	DEG C READS	DEG C ACTUAL
25.4	25.0	15.0	15.00
50.6	50.0	24.9	25.00
75.2	75.0		

ALL TEMPERATURES GIVEN IN DEGREES CELSIUS (DEG C)

REQUIRED ACCURACY: +/- 1.5% RH, +/-0. 2 DEG C

SERVICE NOTE: THIS UNIT MEETS THE REQUIRED ACCURACY, "AS FOUND, AS LEFT"

ENVIRONMENTAL CONDITIONS
72 DEG F
30 % RH

Quality Manual Rev. 25

PROCEDURE MCS2012 rev. 04
CYCLE 12
BY PA

MCS TRACEABILITY

MCS ITEM #	EQUIPMENT USED	TRACEABILITY #	CURRENTLY DUE
109385	HYGROMETER / PRECISION / DIGITAL	20623-Z01	6/29/2025

Q.A. MCS

VALID ONLY WHEN APPROVED BY MCS QUALITY ASSURANCE PERSONNEL

meriam®

10920 Madison Ave
Cleveland | Ohio | 44102 | USA
+ 1 216 281 1100
www.Meriam.com
(800) 817-7849

A trusted leader in measurement and calibration solutions.

Calibration Certificate

Date of Calibration	**2025-01-06**	Certificate Number	**2501000036**

Instrument Model Name	Smart Manometer
Instrument Model Number	ZM2000N-AI0030
Serial Number	**2501000018**

Manufacturer	Meriam
Sensor Model Number	Z9A1656-2
Sensor Serial Number	2437000045
Sensor Description	Absolute Isolated 0 to 30 psi
Instrument Accuracy	±(0.005% of Reading + 0.02% of Full Scale) Temperature Compensated: -20 °C to +50 °C

The certification of the instrument identified above is traceable to the International System of Units (SI) through the National Institute of Standards and Technology, or through globally recognized natural physical constants.

The above mentioned certification was completed in accordance with Meriam Quality System document A35924. Test reports without signatures are not valid

ISO 9001:2015 Certified

Verified by Calibration Technician — James G. Mortach

James G. Mortach

Report Date: **2025-01-06**

Form Title: Audit Checklist	**Implementation Date:** July 07, 2025
Document Number: 317AA-OPS-FM25	**Form Owner (Department):** MAQS
Revision Number: R0	**Form Approval:** KLiangou

Audit Checklist

Business Name: Collins Aerospace
Audit Period: 7/15-17/2025
Auditor's Name: Randy Gibbons, Terra Applied Systems
Date: 8/15/2025

Audit Instruments:
Unisearch LasIR Dual Gas H2S/HCN analyzers, M/N: LAS-RM202-H2S/H2O/CO2 - HCN/H2O-1, s/n: LAS23-067, LAS23-068, LAS23-069 12 sets of optics 6 retroreflectors 3 cabinets/HMI

Task	Passed/Failed	Comments
Check if instruments are operational	PASS	Reflectors had various stages of fouling.
Check if data is collected	PASS	Data pulled 7/1-7/17/25
Check if scripts are running correctly	PASS	Appears fully operational
Check if instruments are aligned	PASS	Path 6 strong diurnal movement into low light, good light mid-day
Check calibration verification	PASS	All paths bump tested
Check housekeeping	PASS	Generally, well cleaned and orderly. Some spider webs.
Check historical data	PASS	
Check instrument parameters (e.g. laser, UV bulb etc.)	PASS	See live plot data.**
Check if additional maintenance is required		See below for reflector cleaning, pest control.

Comments: Have pest control treat for pests – spider webs cause noise.
Recommended retro cleaning method:

- •Remove reflector array
- •Apply dish detergent
- •lightly brush with clean China bristle brush
- •Multiple rinse with demineralized water
- •Rinse with >90% isopropanol
- •Air dry
- •Remount reflector
- •Continue air dry

**Details pending

Auditor's Signature: