



Quarterly Report – Quarter 3 – 2025





November 03, 2025

Bazan Group

Haifa, Israel

Subject: Quarterly Report for Open-Path UV Air Monitoring

This report summarizes the data collected by the four open-path UV air monitoring systems that were installed at the Bazan refinery during the time period of July to September 2025 (Quarter 3). During this time, the four systems continuously monitored and quantified concentrations of Benzene, Toluene, Ethyl Benzene and Xylene (BTEX) gas along the refinery's fence line. Measurement data from the analyzers, along with meteorological data, were reported to a secure website. Alarm notifications were triggered in the event of target gases detected above preset levels. The following report presents the summary results of the measurement period for each beam path.

Operational Performance Events

As of the end of Q3 2025 the onstream efficiency for the systems was 99.36%

Maintenance Activities

Routine maintenance and quality assurance/quality control (QA/QC) for the open path UV monitoring systems occurred on 11th, 14th, 15th, 21st, and 26th of July, the 4th, 19th, 24th, and 28th of August, and the 12th and 25th of September 2025.



Summary Findings

From the results of the report the following were noted:

- The sample paths detected compounds at different times. This was expected as the paths (due to their orientation) were affected by sources from the refinery under different weather conditions.
- Winds were predominantly from the West-North-West during the period under review.

Please do not hesitate to contact me if you have questions or need additional information regarding the report.

Best Regards,
Bazan Group



Report Details

Reference	Bazan_Quarterly report_Q3_2025
Report Title	Quarterly Report for Bazan Fence line Monitoring System – Quarter 3 2025
Date Submitted	November 03, 2025
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Status	Signed
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REPORT DETAILS

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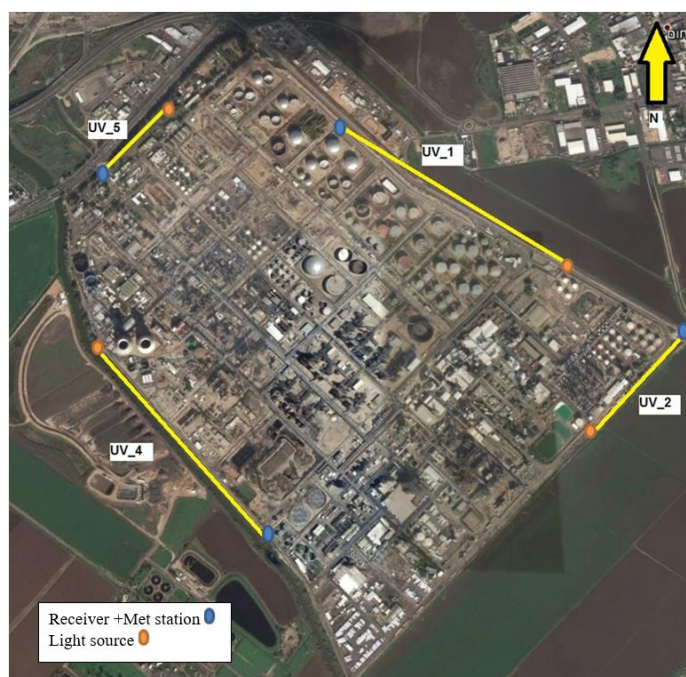
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Section 1 – Introduction

The Fence-Line Monitoring Network (FLM) at the Bazan Refinery in Haifa, Israel consists of four open-path Ultraviolet (UV) Monitoring Stations and four meteorological (MET) stations. The UV monitoring systems continuously measure benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in parts-per-billion (ppb) using the Argos UV Quant software, providing real-time air quality data. The MET stations are located at the source side of each UV system and record temperature, relative humidity, wind speed and wind direction. The fence-line monitoring equipment is installed along four key sections of the refinery's perimeter. The path monitoring locations are shown in Figure 1.1. The beam paths covered are referenced as: Refinery Northeastern line 867 meters (UV_1); Gadiv Eastern line 428 meters (UV_2); Western Line (UV_5) 311 meters and Refinery Southwestern line (UV_4) 822 meters.

Figure 1.1 - Location Map Showing Fence Lines Covered by Argos Open-path UV Air Monitoring Systems





Each site is equipped with a meteorological station measuring the following parameters:

- Wind speed
- Wind direction
- Temperature
- Relative humidity

The purpose of the meteorological station is to assist in determining the direction of pollution sources at the height of the Fenceline monitoring system.

The third quarter summary of the measurements performed by the system for 2025, are presented in the sections that follow. The measurements for Benzene were performed using an in-house validated method "FLM-QLT-MET-001 Determination of BTEX by UV DOAS" which is based on TO-16 and EPA 301 methods.

Section 2 - Quality Assurance Quality Control Checks

The Argos Open-path UV air monitoring systems employ a number of methods to check the data quality of the system. Table 2.1 summarizes the routine data quality checks employed during the project. Each data quality check is described below.

Table 2.1 –Quality Checks

Data Quality Check	Frequency
Continuous Data Quality Checks	Continuous
System Check	Daily
Challenge of System with Known Quantity of Gas	Every two weeks
Independent Check of Gas Detects	As Needed

Continuous Data Quality Checks (Frequency – Continuous)

Data generated by the fence-line monitoring equipment undergoes review throughout the measurement and reporting process. This includes automated QA/QC checks that occur before data is reported on the real-time website. Automated data checks are listed in Table 2.2.

System Check (Frequency – Daily)

During the measurement period Argos provided continual on-call support for the fence-line monitoring network. This includes an alarm system that notifies a support team in the event of malfunction or high detections of gases, loss of Internet connections and other issues that might impact the performance of the monitoring equipment. The support team includes staff who are experts in the field of UV spectroscopy. In addition, each day Argos staff remotely accesses the local instrument computers and perform data checks to ensure the system is operating properly. This includes but was not limited to:

- Troubleshooting software issues
- Checking light signals
- Perform validation checks on gas detections



Table 2.2 – Real-time Data Quality Checks

Real-Time Check	Check	Action
Low Signal Alarm	Signal threshold test	If signal is below threshold value, real-time website reports "Low Signal". Automated email is sent to notify support staff of the issue.
Instrument Error Code	Instrument Error Code	Real-time website reports "Off-line" message. Automated email is sent to notify support staff of the issue.
Instrument Workstation Off-line	Instrument Communication Check	Real-time website reports "Off-line" message. Automated email is sent to notify support staff of the issue.
Internet Connection Lost	Backup Connection enabled	Automated email is sent to notify support staff of the issue.
High Detection	Valid Data Detection Above Threshold	Real-time website indicates detection above alarm threshold. Automated email is sent to notify support staff of the issue.



Challenge of System with Known Quantity of Gas (Frequency – Every two weeks)

The UV systems are calibrated by inserting a known concentration of a target gas into the beam and then measuring the system response. The target gas is held inside a sealed cell with windows that minimize absorption of UV light. The measurement will be considered passing if the quantified result is within 15% of the expected value.

Tables 2.3, 2.4, 2.5 and 2.6 below summarize the QA check results for the system for Q3 2025.

Table 2.3: Summary of Q3 2025 Benzene Challenge Gas Checks at UV1

Date	Times	Expected (ppb)	Measured (ppb)	% Difference	Status
15/07/2025	21:51	21.80	20.21	7.28	Pass
21/07/2025	20:24	21.80	20.15	7.54	Pass
04/08/2025	19:58	21.80	20.44	6.22	Pass
19/08/2025	22:55	21.80	19.71	9.58	Pass
12/09/2025	23:48	21.80	20.09	7.84	Pass
25/09/2025	14:26	21.80	19.21	11.89	Pass



Table 2.4: Summary of Q3 2025 Benzene Challenge Gas Checks at UV2

Date	Times	Expected (ppb)	Measured (ppb)	% Difference	Status
11/07/2025	16:20	16.12	15.68	2.71	Pass
21/07/2025	21:36	16.12	17.15	6.35	Pass
04/08/2025	20:35	16.12	16.25	0.82	Pass
28/08/2025	08:55	16.12	15.02	6.86	Pass
12/09/2025	00:47	16.12	14.42	10.58	Pass
25/09/2025	14:40	16.12	14.90	7.57	Pass



Table 2.5: Summary of Q3 2025 Benzene Challenge Gas Checks at UV4

Date	Times	Expected (ppb)	Measured (ppb)	% Difference	Status
11/07/2025	16:49	5.84	6.31	8.10	Pass
28/07/2025	10:54	5.84	5.89	0.80	Pass
04/08/2025	21:26	5.84	6.13	4.93	Pass
19/08/2025	23:47	5.84	6.04	3.49	Pass
12/09/2025	1:18	5.84	6.07	3.94	Pass
25/09/2025	14:38	5.84	6.26	7.21	Pass



Table 2.6: Summary of Q3 2025 Benzene Challenge Gas Checks at UV5

Date	Times	Expected (ppb)	Measured (ppb)	% Difference	Status
11/07/2025	17:16	5.79	5.93	2.42	Pass
26/07/2025	19:55	5.79	5.79	0.00	Pass
04/08/2025	22:10	5.79	6.08	5.08	Pass
28/08/2025	08:40	5.79	5.72	1.28	Pass
12/09/2025	2:03	5.79	5.70	1.58	Pass
25/09/2025	15:38	5.79	5.79	0.06	Pass



Independent Check of Gas Detects

In addition to automated features in the software, Argos technical data analysts have the ability to check the system performance by carrying out independent quantification of target gases. Depending on the specific application, these activities are performed on a routine basis to ensure the automated data collection and verification process is functioning correctly. An example of this process is presented below:

- Collect a data spectrum in the atmosphere when the target gas is not present. Define this as the background spectrum.
- Collect a data spectrum in the atmosphere when the target gas is present. Define this as the data spectrum.
- Subtract the logarithms of the two spectra. This resulting spectrum is defined as an absorbance spectrum.
- Compare this spectrum to a quantitative absorbance spectrum of the target gas.

Minimum Detection Limit Checks

The minimum detection limits for the system were calculated for Q3 2025 and are shown in Table 2.7 below:

Table 2.7: Minimum Detection Limits for Systems for Q3 2025

Location	July MDL (ppb)	August MDL (ppb)	September MDL (ppb)
UV_1	0.16	0.13	0.11
UV_2	0.19	0.14	0.14
UV_4	0.33	0.20	0.21
UV_5	0.11	0.13	0.14



Section 3 - Summary of Field Data

As mentioned in Section 1, the air monitoring equipment operated continuously during Q3 2025. The following figures and tables summarize the data collected during this time period for BTEX gases. Each system collected data at five-minute averages. Table 3.1 lists the time periods that valid data was collected at each location.

Table 3.1 – Data Collection periods

System	Data Start	Data End	Onstream (%)
UV1	07/01/2025	09/30/2025	99.42
UV2	07/01/2025	09/30/2025	99.44
UV4	07/01/2025	09/30/2025	99.42
UV5	07/01/2025	09/30/2025	99.15

The following alarms were set by the client and were used to measure the performance of the system:

- Benzene:
 - 20 microgram/m³ half hour average. (30 min alarm)
 - 2 consecutive measurements of 10 microgram/m³ half hour average. (1 hr alarm)
 - 3.9 microgram/m³ daily average. (24 hr alarm)
- Toluene: 3,770 microgram/m³ daily average.
- Total Xylenes: 4,800 microgram/m³ daily average (Almog value).
- Ethyl Benzene: 54,000 microgram/m³ 15-minute average (Almog value)



UV1 – Summary of Daily Average Field Data

Figures 3.1 to 3.5 show the daily average data collected from the UV1 system

Figure 3.1 – Benzene 24 Hour Average Data for UV1 for Q3 2025

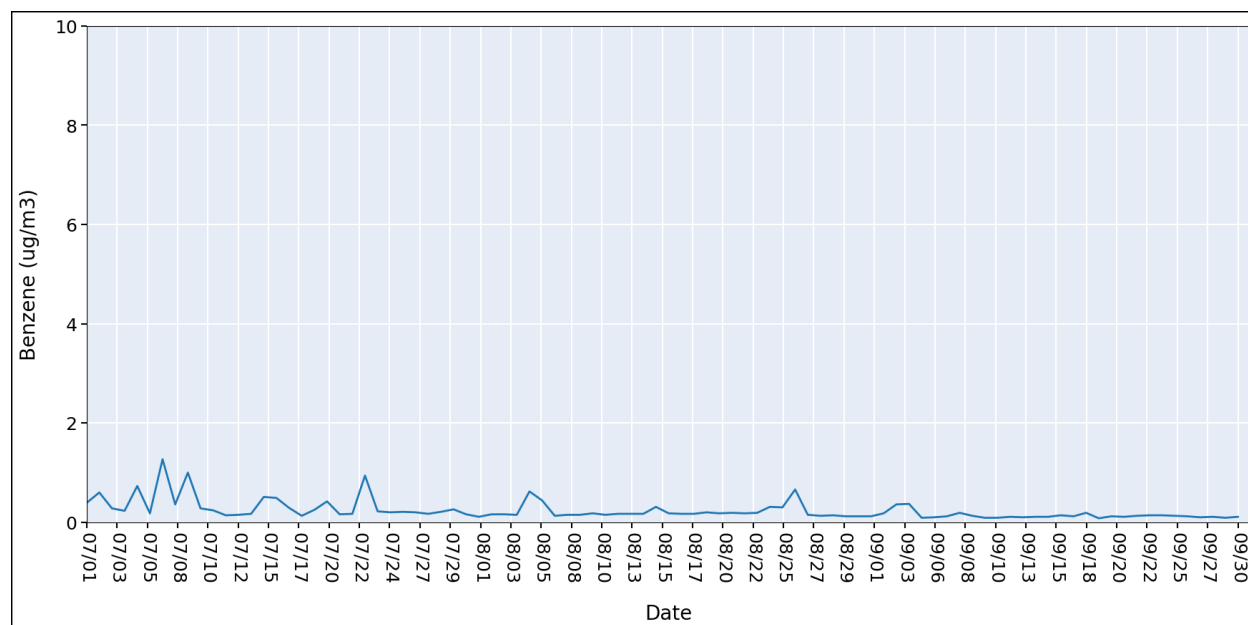




Figure 3.2 – Toluene 24 Hour Average Data for UV1 for Q3 2025

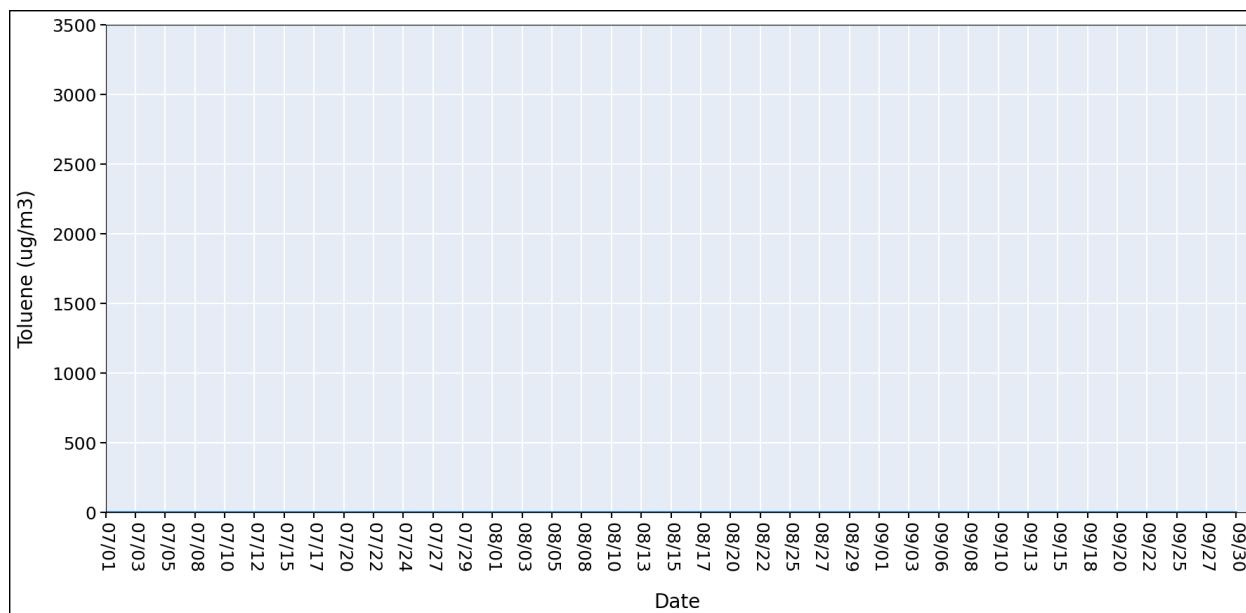




Figure 3.3 – Xylene 24 Hour Average Data for UV1 for Q3 2025

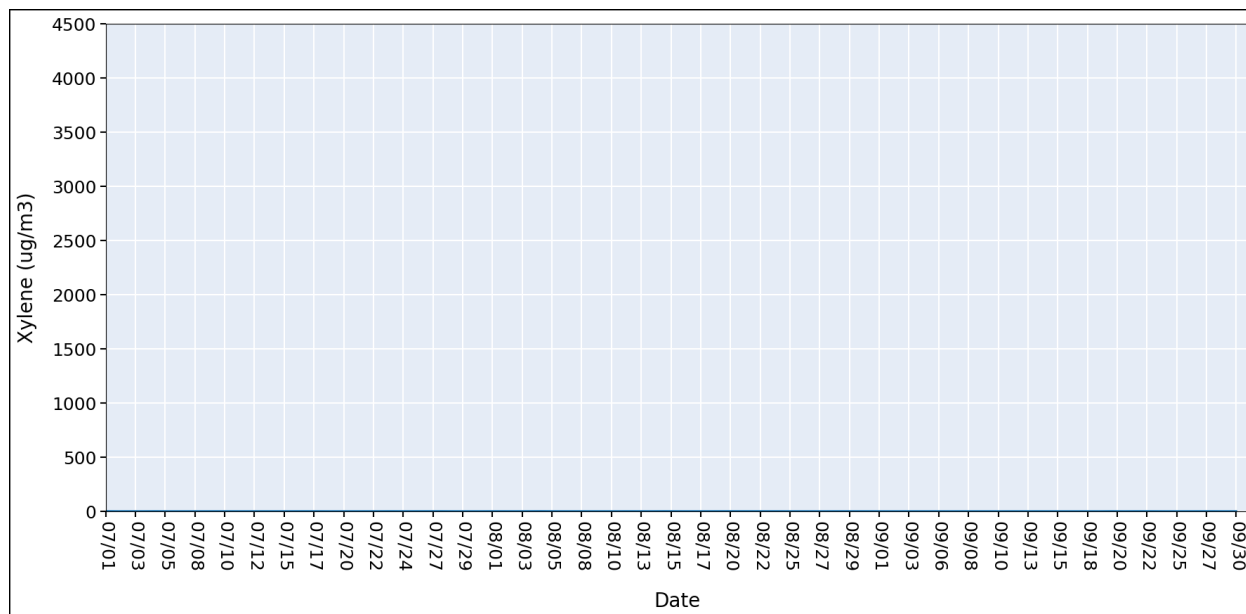


Figure 3.4 - Ethyl Benzene 24 Hour Average Data for UV1 for Q3 2025

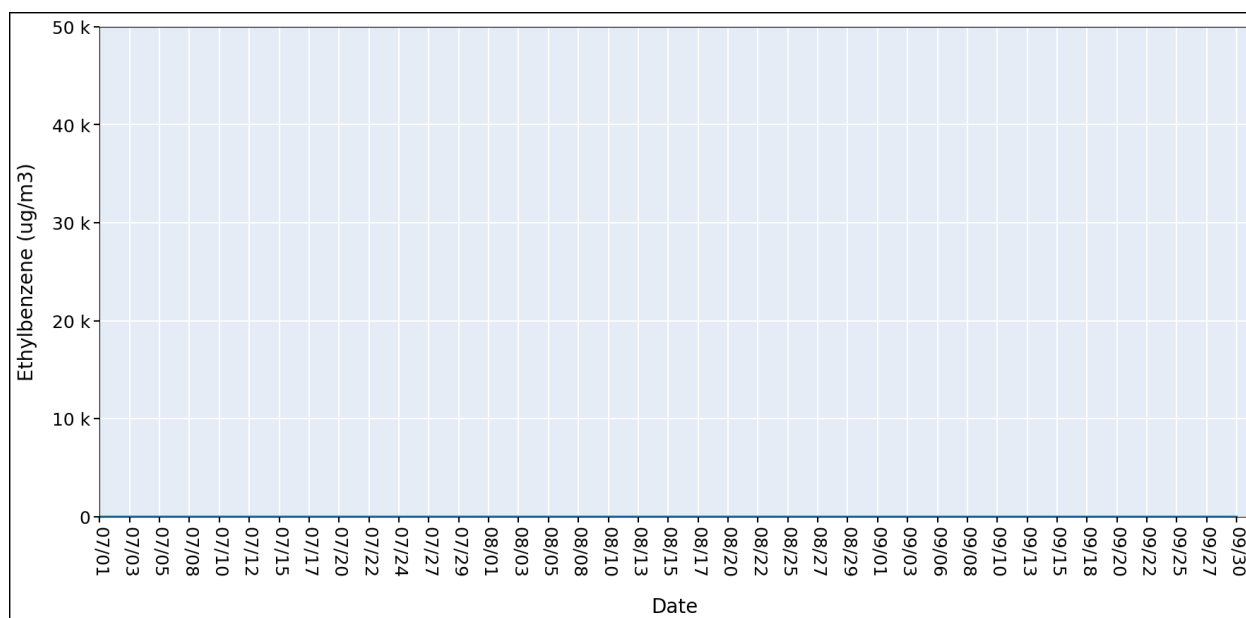
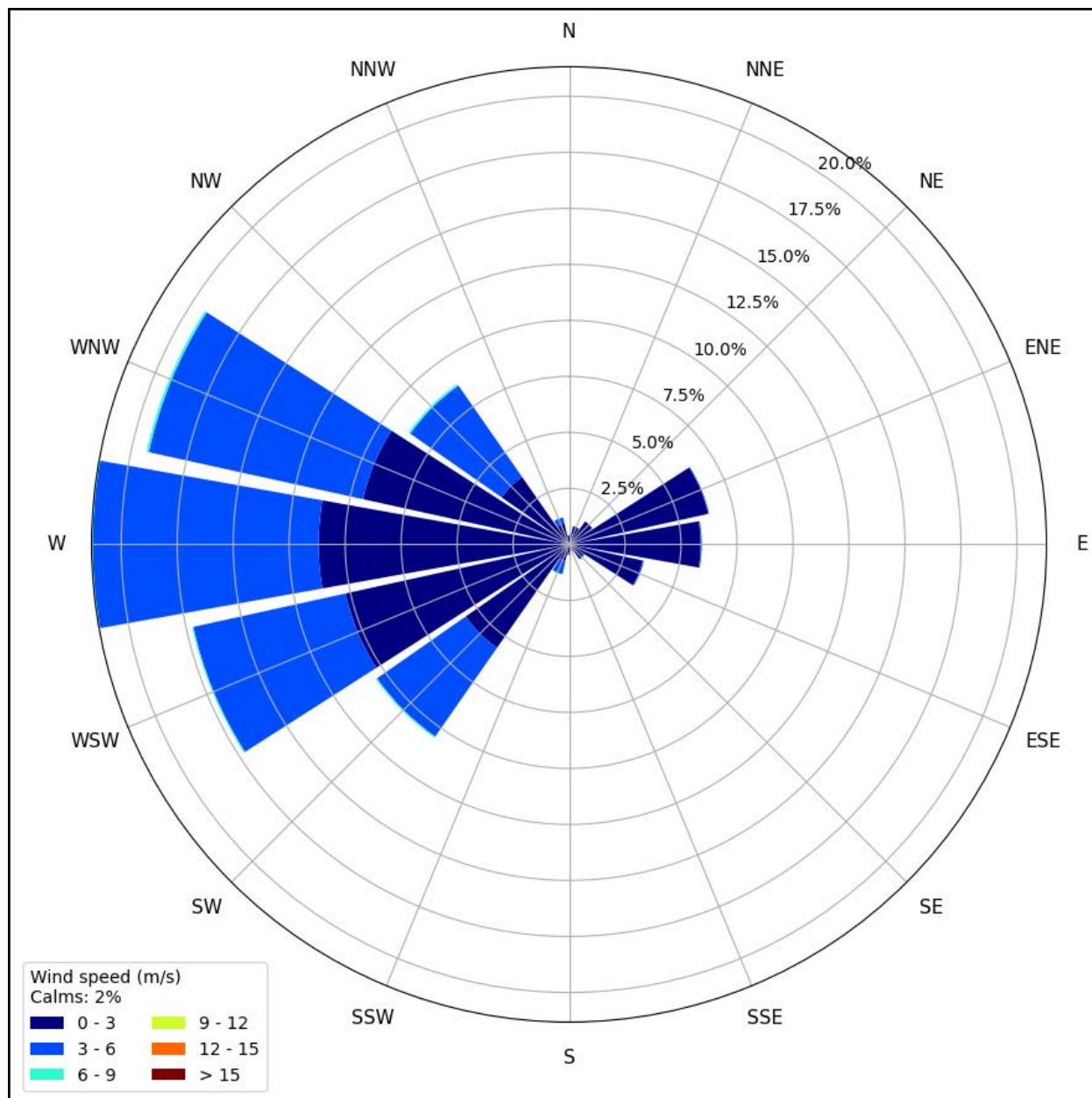


Figure 3.5 – Wind Speed and Wind Direction for UV1 for Q3 2025





UV2 – Summary of Realtime Field Data

Figures 3.6 to 3.10 show the daily average data collected from the UV2 system

Figure 3.6 – Benzene 24 Hour Average Data for UV2 for Q3 2025

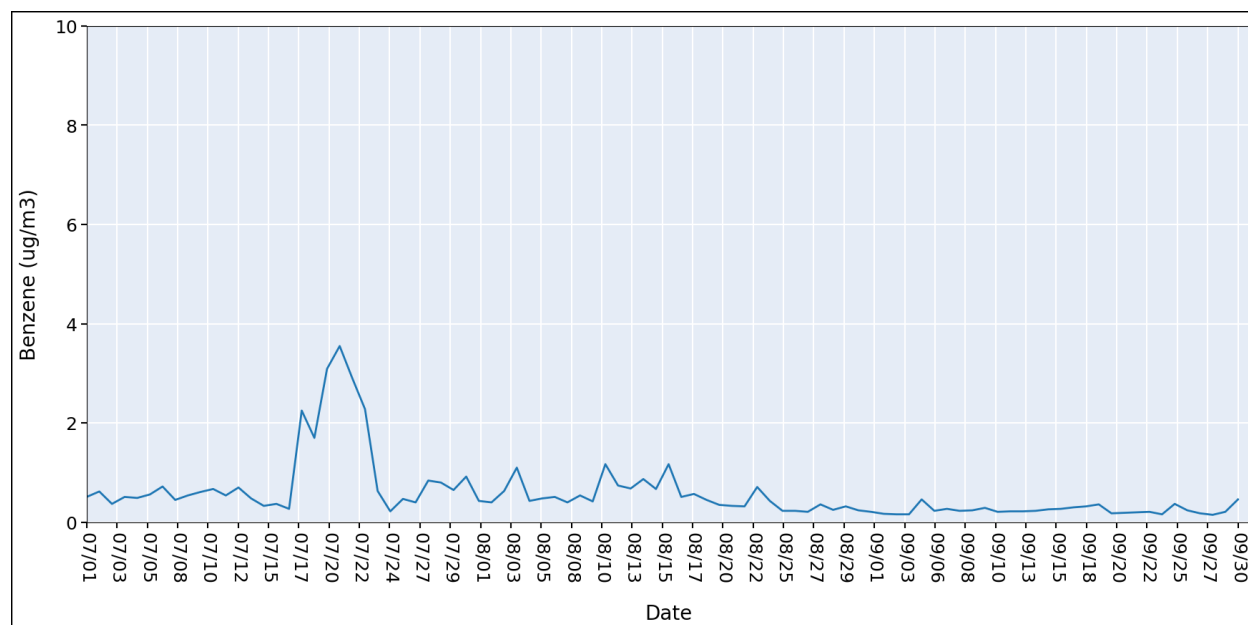




Figure 3.7 – Toluene 24 Hour Average Data for UV2 for Q3 2025

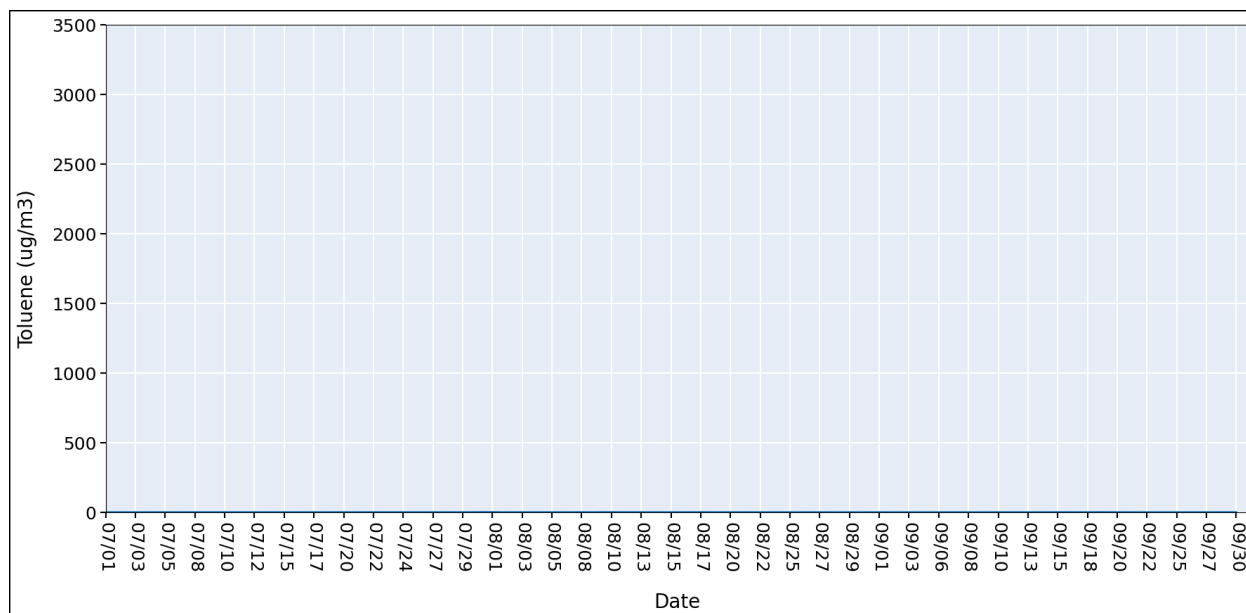




Figure 3.8 – Xylene 24 Hour Average Data for UV2 for Q3 2025

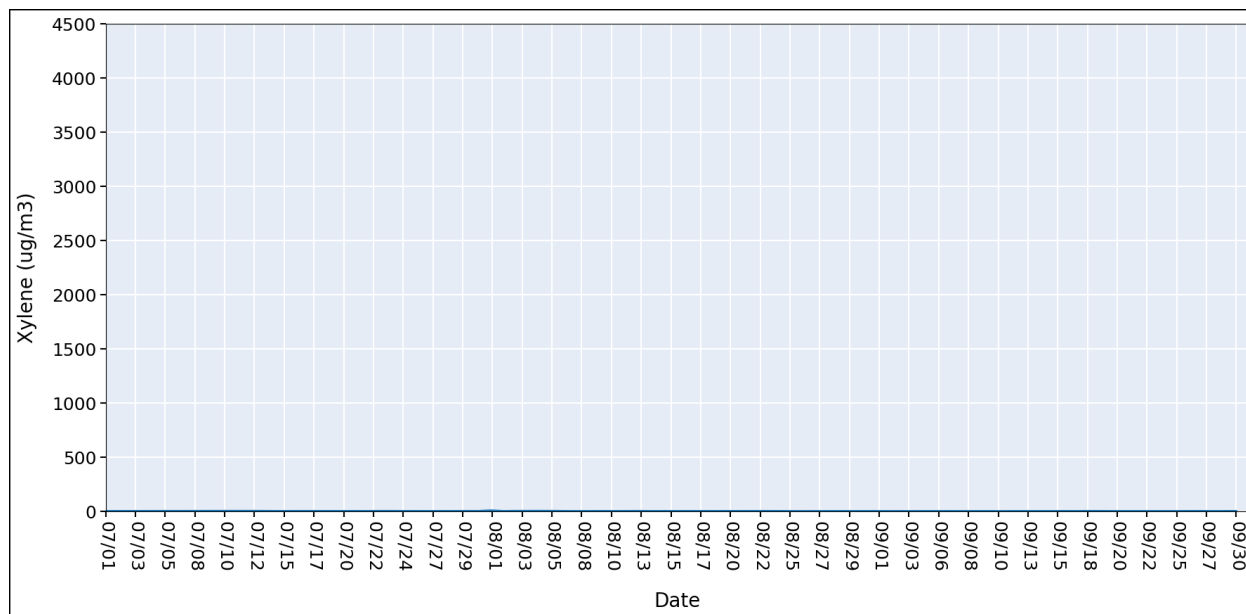


Figure 3.9 – Ethyl Benzene 24 Hour Average Data for UV2 for Q3 2025

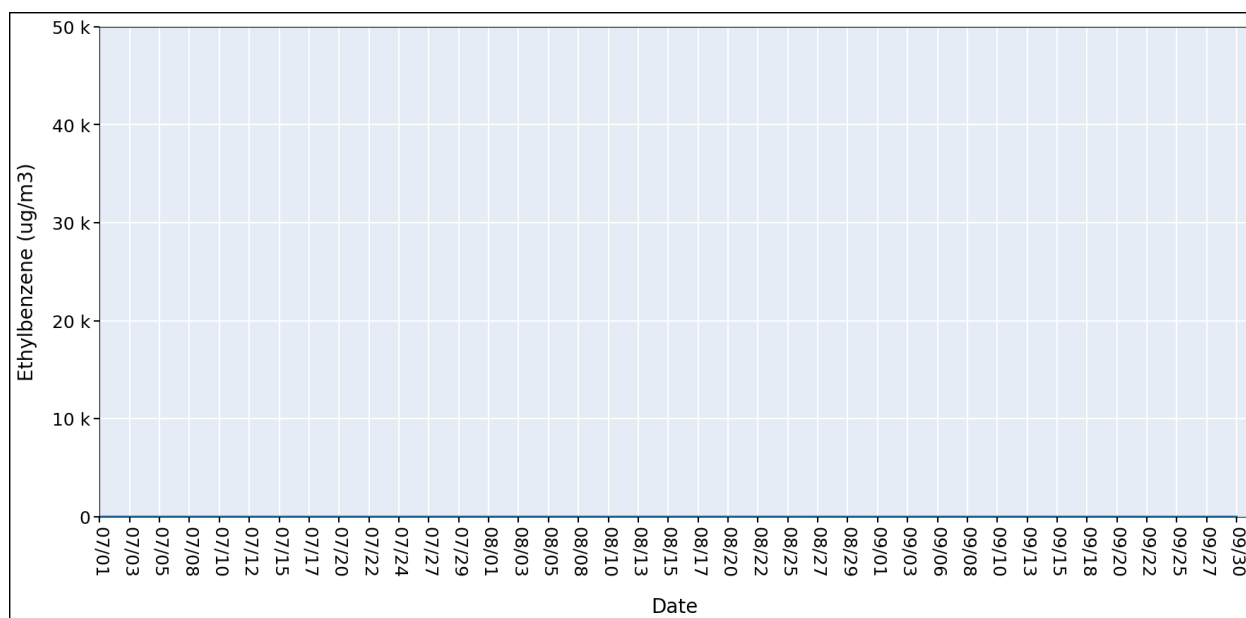
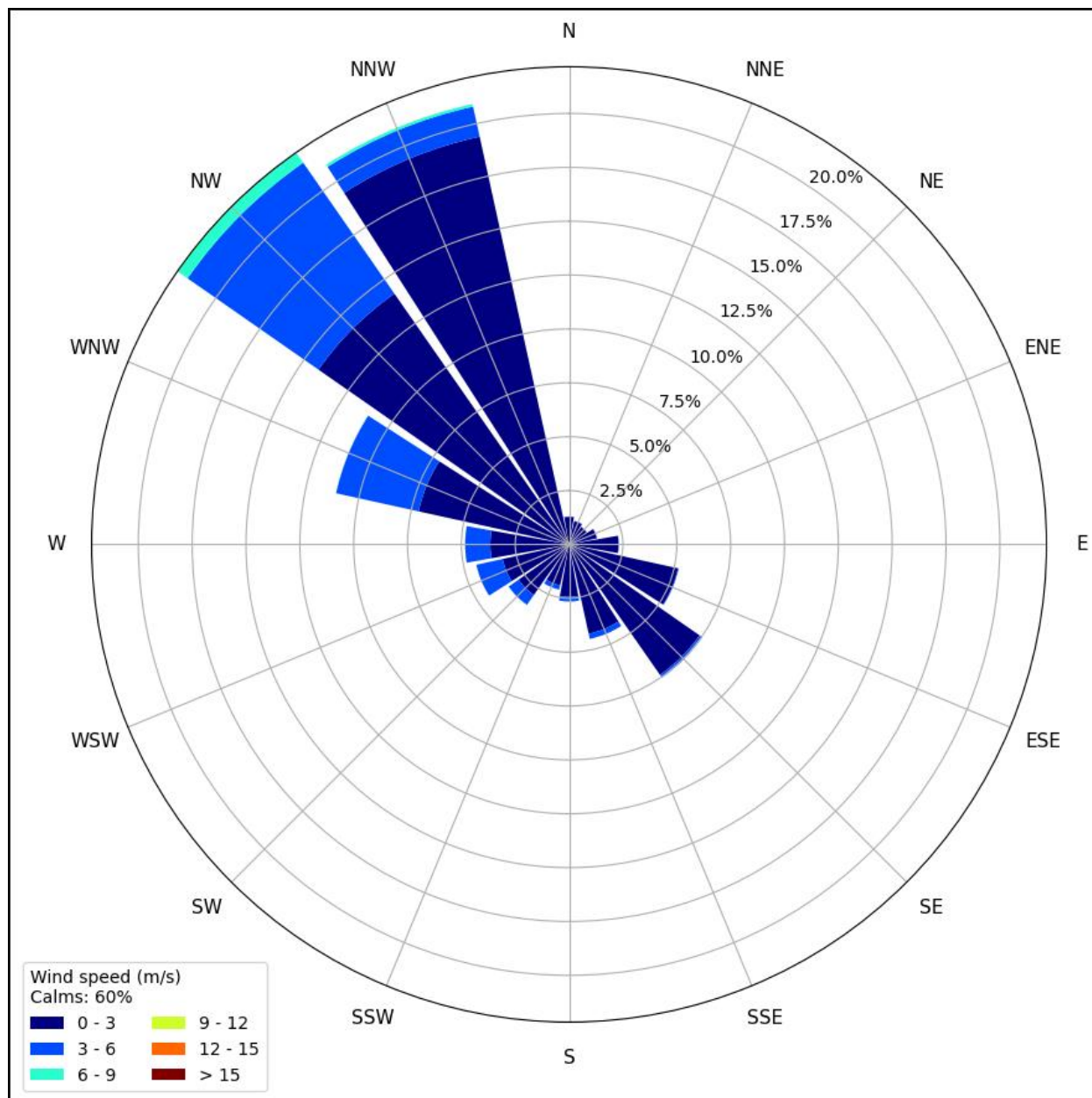


Figure 3.10 – Wind Speed and Wind Direction for UV2 for Q3 2025





UV4 – Summary of Realtime Field Data

Figures 3.11 to 3.15 show the daily average data collected from the UV4 system

Figure 3.11 – Benzene 24 Hour Average Data for UV4 for Q3 2025

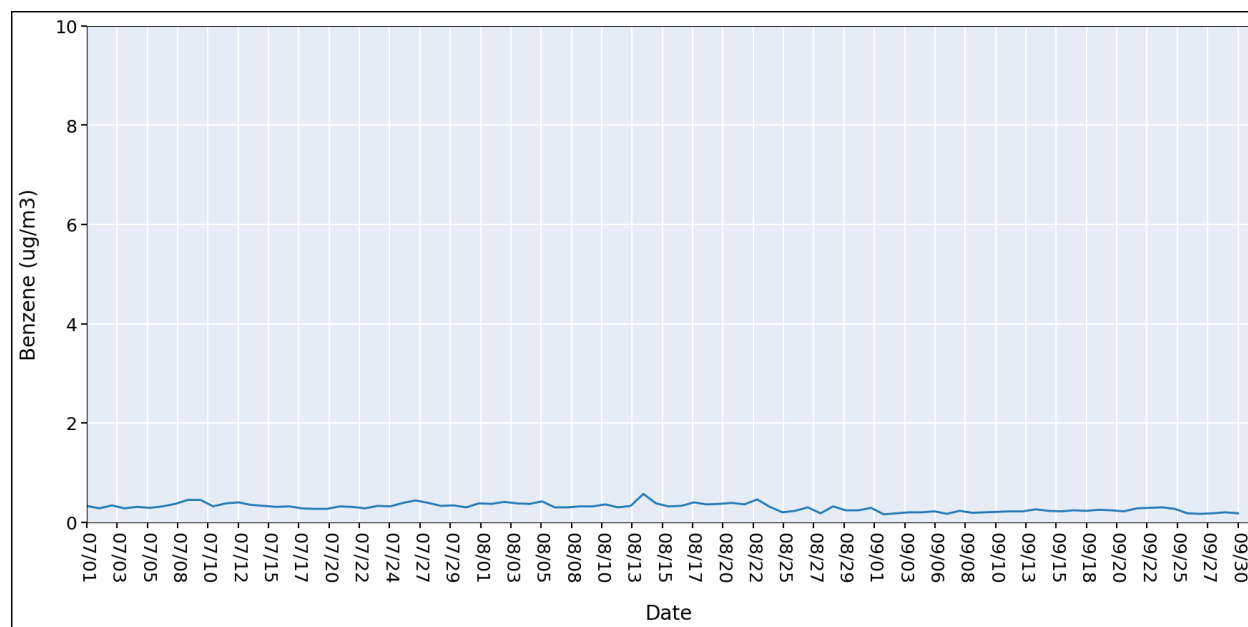




Figure 3.12 – Toluene 24 Hour Average Data for UV4 for Q3 2025

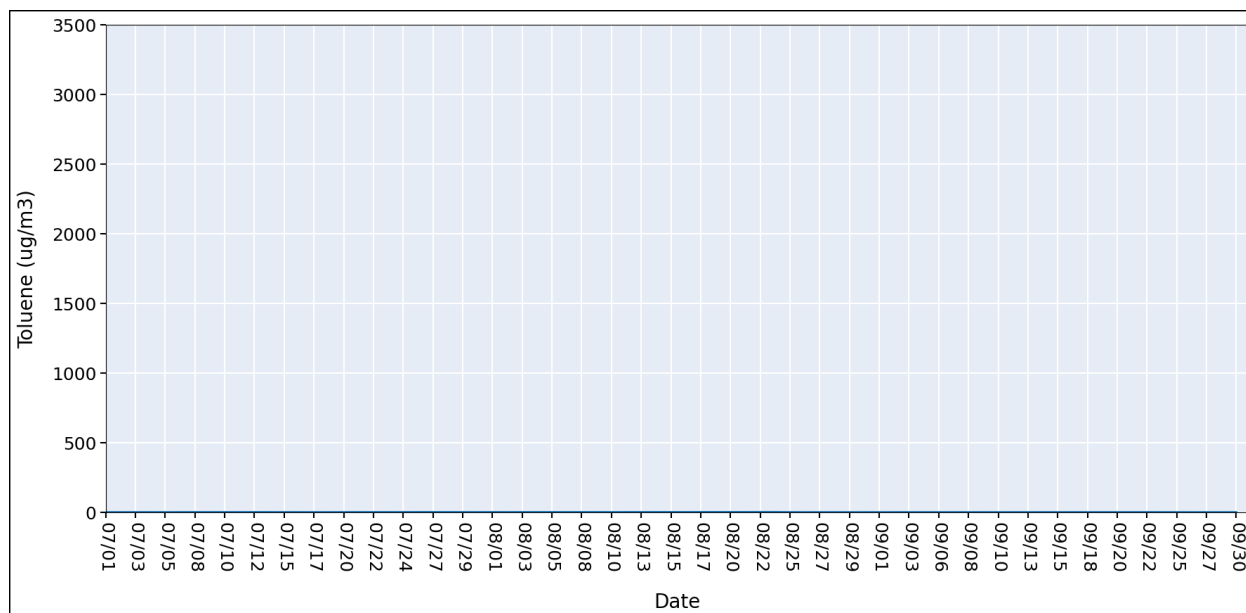




Figure 3.13 – Xylene 24 Hour Average Data for UV4 for Q3 2025

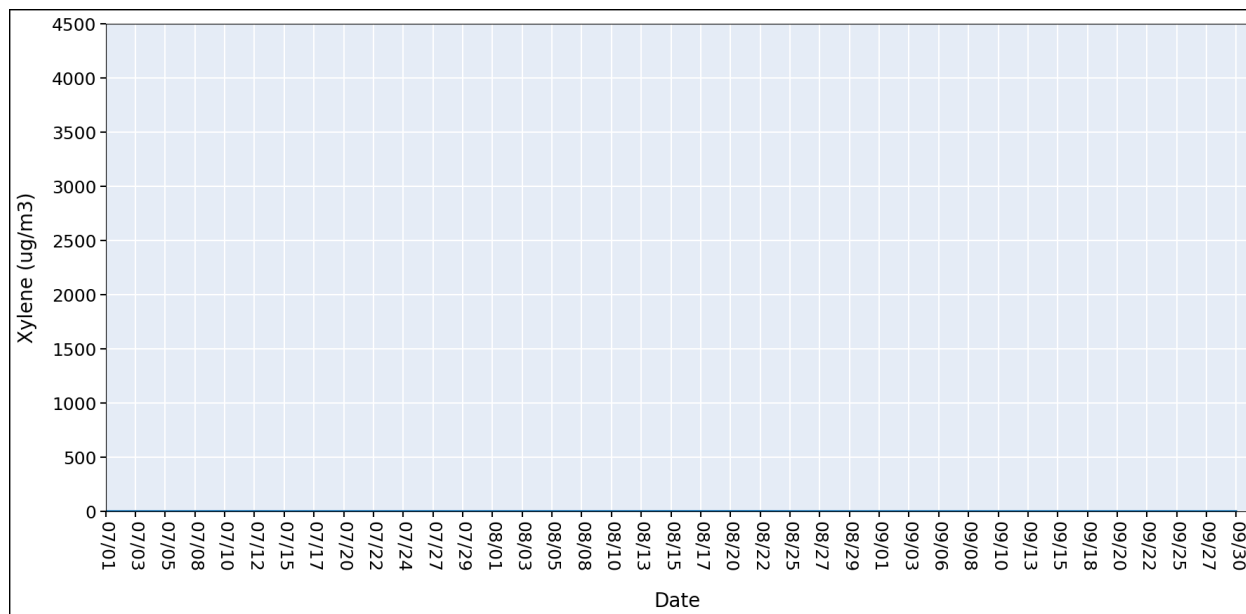


Figure 3.14 – Ethyl Benzene 24 Hour Average Data for UV4 for Q3 2025

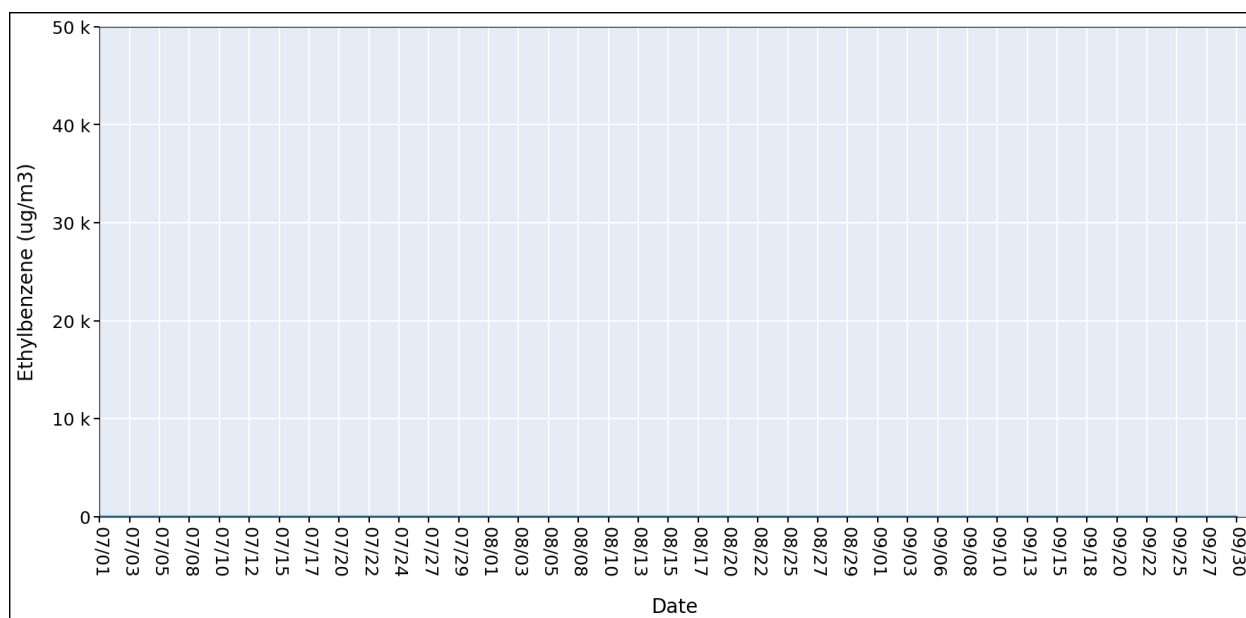
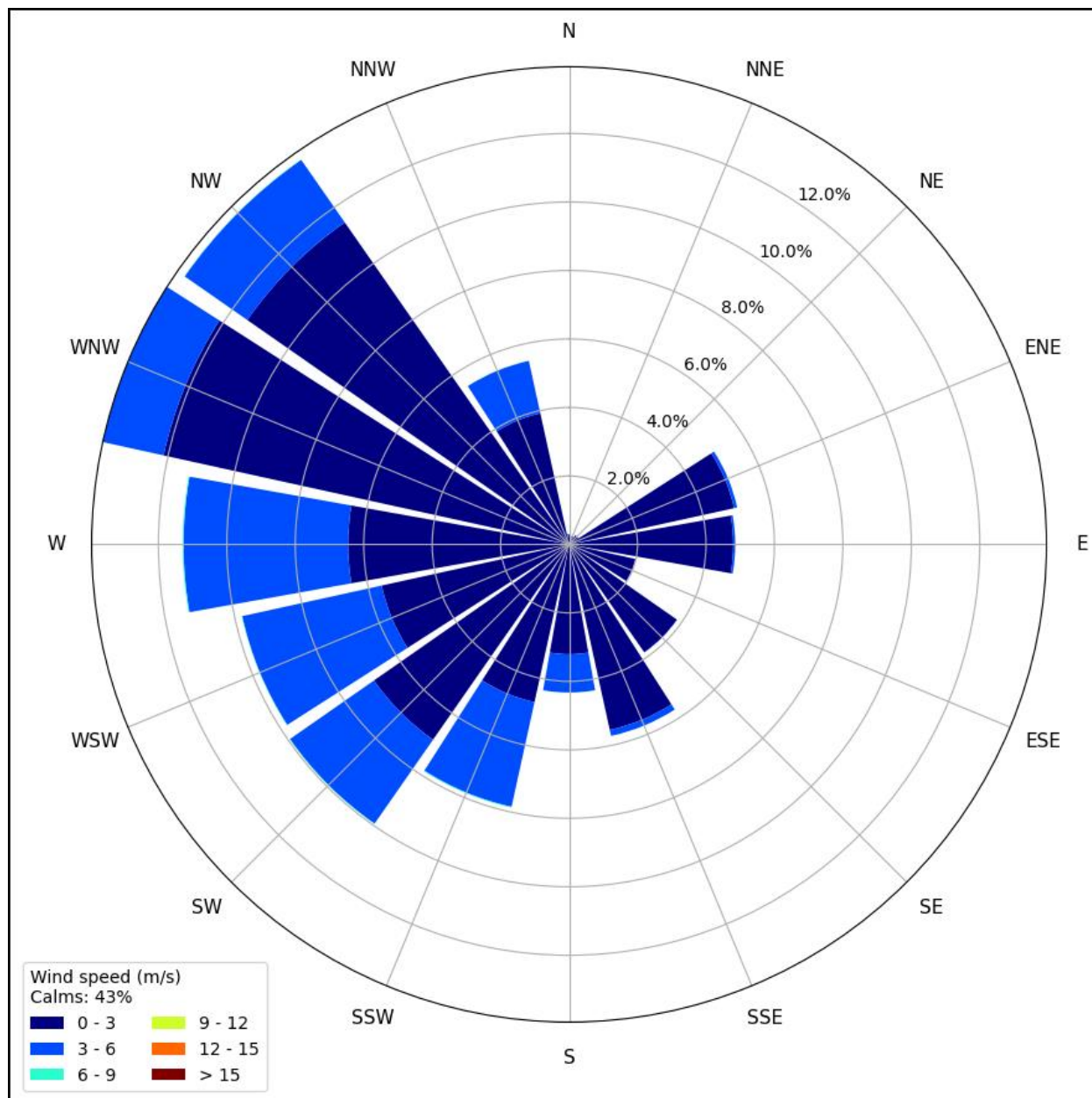


Figure 3.15 – Wind Speed and Wind Direction for UV4 for Q3 2025





UV5 – Summary of Realtime Field Data

Figures 3.16 to 3.20 show daily average data collected from the UV5 system

Figure 3.16 – Benzene 24 Hour Average Data for UV5 for Q3 2025

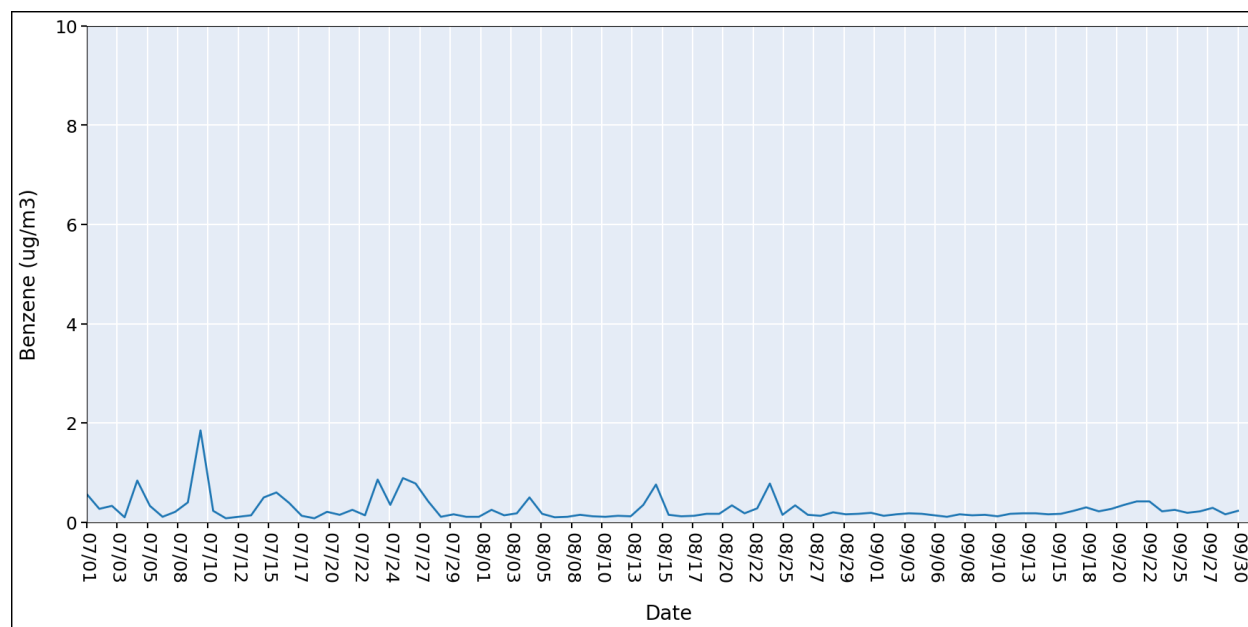




Figure 3.17 – Toluene 24 Hour Average Data for UV5 for Q3 2025

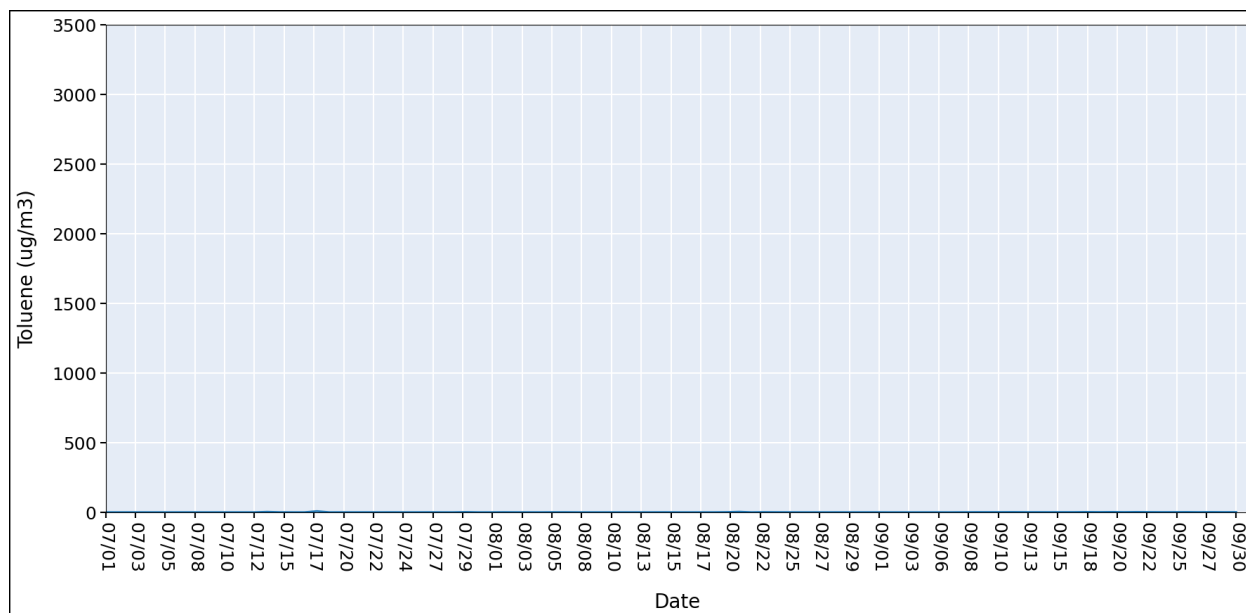




Figure 3.18 – Xylene 24 Hour Average Data for UV5 for Q3 2025

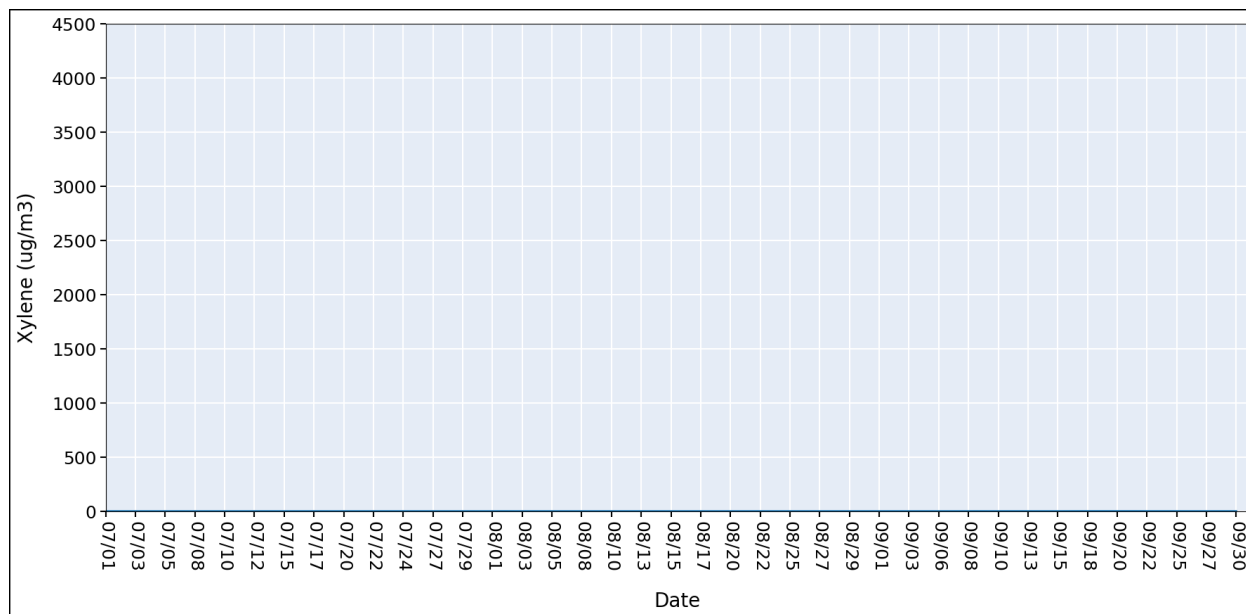


Figure 3.19 – Ethyl Benzene 24 Hour Average Data for UV5 for Q3 2025

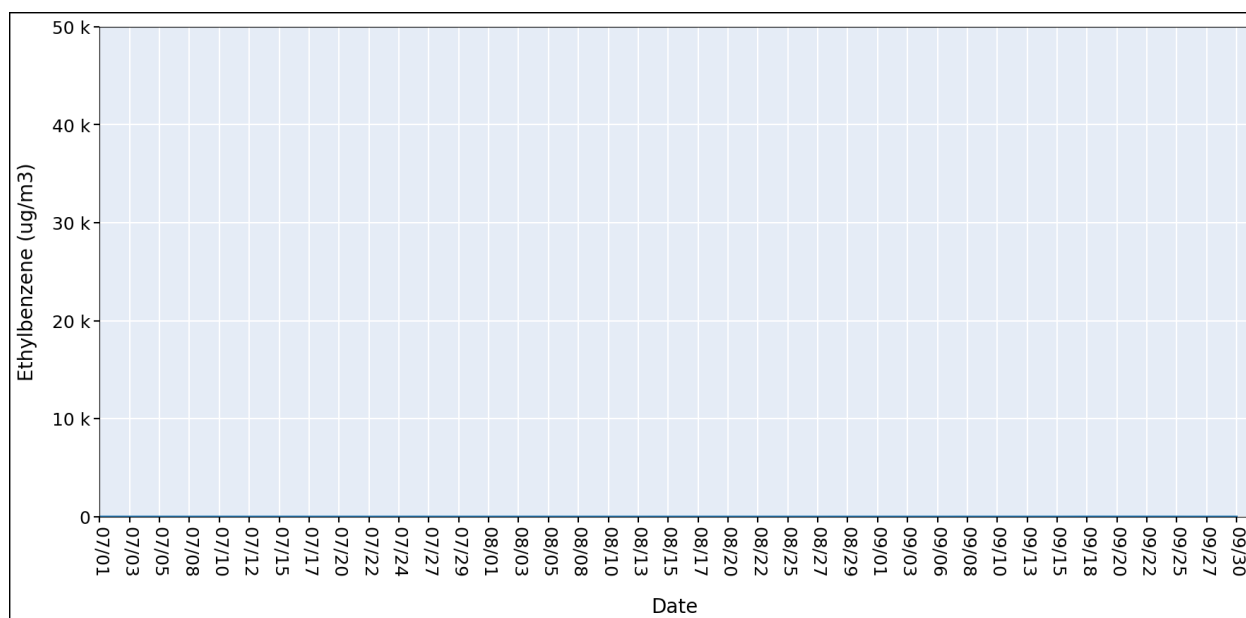
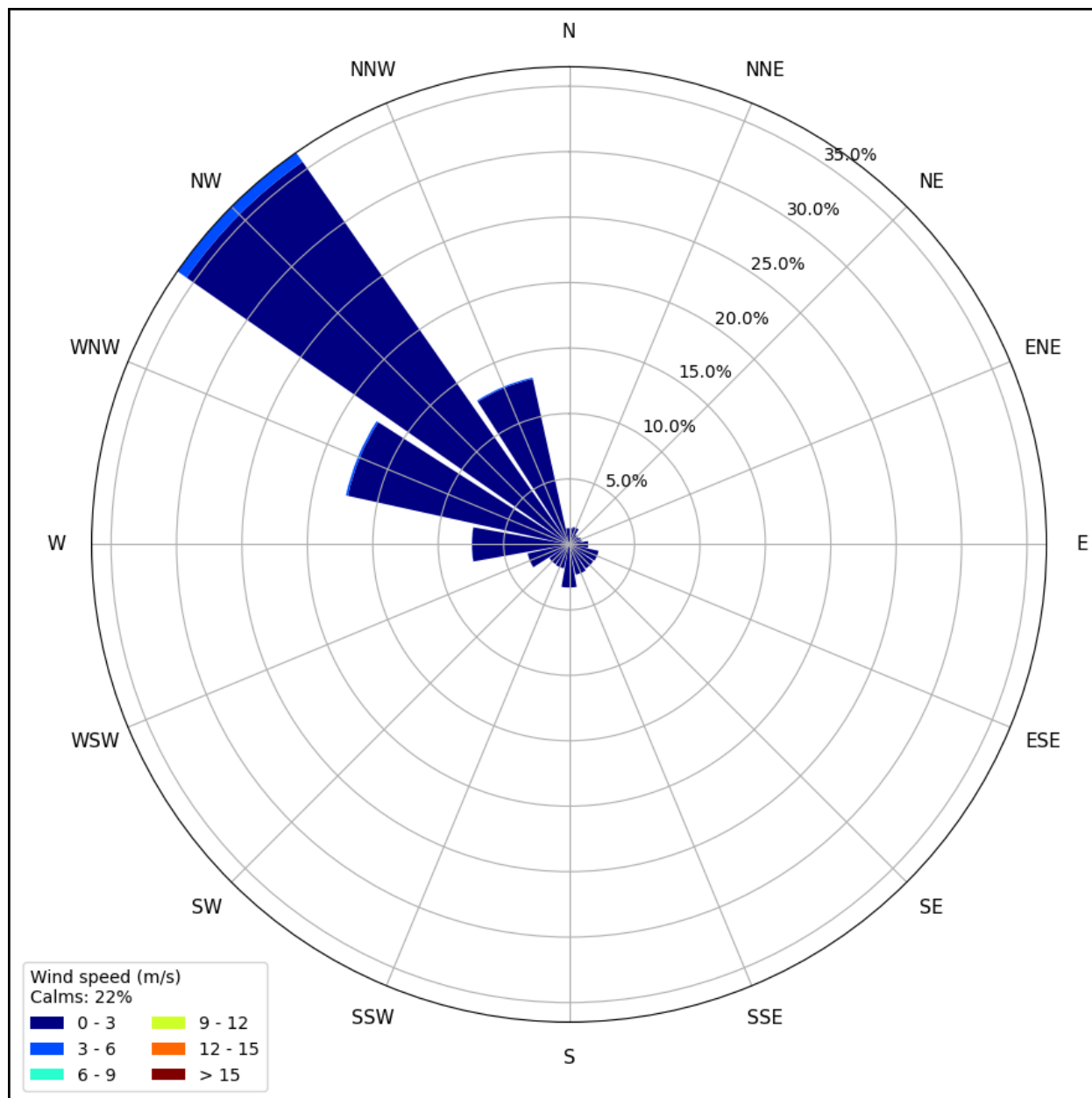


Figure 3.20 – Wind Speed and Wind Direction Data for UV5 for Q3 2025





The 24-hour alarm level was not exceeded for benzene during Quarter 3 2025.



Section 4 – Summary Notes

From the results in Section 3 above the following were noted:

- The sample paths detected compounds at different times. This was expected as the paths (due to their orientation) were affected by sources from the refinery under different weather conditions.
- Winds were predominantly from the West-North-West during the period under review.

The results of the measurements indicate the Argos Open-path UV air monitoring systems were able to detect and quantify BTEX emissions from sources both within and outside of the Bazan Refinery. Specific activities associated with detections by the fence-line systems could be identified based on the specific gases being detected, the wind speed and direction, and the specific time of day when the detection occurred.



Appendix A: Calibration Certificates

Certificate of Calibration

Sealed Calibration Cell Serial # **BENZ001**

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet reference libraries created by permeation tubes traceable to N.I.S.T standards. This analysis was completed using data provided by Argos Scientific collected in April 2025.

Permeation Tubes Serial Numbers: 13762/13769

Permeation Fluid: Benzene

Calibrated with 40.0 ppm-m Reference Standard

Calibration Cell Concentration: **6.9 ppm-m**

Lower 95% confidence: 5.7 ppm-m

Correlation Coefficient: 0.90

Upper 95% confidence: 8.0 ppm-m

Date: October 24, 2025

Brentley S. Olive MSPH, Ph.D., CIH



Department of
CHEMISTRY and PHYSICS

This work was performed as an individual, and not as an employee of the University of North Alabama Department of Chemistry and Physics. However, the same level of intellectual rigor was applied to this project as any undertaken as an employee of the University of North Alabama.



Certificate of Calibration

Sealed Calibration Cell Serial # **BENZ002**

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet reference libraries created by permeation tubes traceable to N.I.S.T standards. This analysis was completed using data provided by Argos Scientific collected in April 2025.

Permeation Tubes Serial Numbers: 13762/13769

Permeation Fluid: Benzene

Calibrated with 40.0 ppm-m Reference Standard

Calibration Cell Concentration: **4.8 ppm-m**

Lower 95% confidence: 3.2 ppm-m

Correlation Coefficient: 0.90

Upper 95% confidence: 6.4 ppm-m

Date: October 24, 2025

Brentley S. Olive MSPH, Ph.D., CIH



Department of
CHEMISTRY and PHYSICS

This work was performed as an individual, and not as an employee of the University of North Alabama Department of Chemistry and Physics. However, the same level of intellectual rigor was applied to this project as any undertaken as an employee of the University of North Alabama.



Certificate of Calibration

Sealed Calibration Cell Serial # **BENZ005**

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet reference libraries created by permeation tubes traceable to N.I.S.T standards. This analysis was completed using data provided by Argos Scientific collected in April 2025.

Permeation Tubes Serial Numbers: 13762/13769

Permeation Fluid: Benzene

Calibrated with 20.0 ppm-m Reference Standard

Calibration Cell Concentration: **1.8 ppm-m**

Lower 95% confidence: 1.3 ppm-m

Correlation Coefficient: 0.93

Upper 95% confidence: 2.4 ppm-m

Date: October 24, 2025

Brentley S. Olive MSPH, Ph.D., CIH



Department of
CHEMISTRY and PHYSICS

This work was performed as an individual, and not as an employee of the University of North Alabama Department of Chemistry and Physics. However, the same level of intellectual rigor was applied to this project as any undertaken as an employee of the University of North Alabama.



Certificate of Calibration

Sealed Calibration Cell Serial # **BENZ006**

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet reference libraries created by permeation tubes traceable to N.I.S.T standards. This analysis was completed using data provided by Argos Scientific collected in April 2025.

Permeation Tubes Serial Numbers: 13762/13769

Permeation Fluid: Benzene

Calibrated with 40.0 ppm-m Reference Standard

Calibration Cell Concentration: **18.9 ppm-m**

Lower 95% confidence: 15.4 ppm-m

Correlation Coefficient: 0.92

Upper 95% confidence: 22.4 ppm-m

Date: October 24, 2025

Brentley S. Olive MSPH, Ph.D., CIH



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----- End of Report -----