



Quarterly Report – Quarter 2 – 2025





July 22, 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 April to June 2025 (Quarter 2). During this time, the four systems continuously collected and quantified the concentration of Benzene, Toluene, Ethyl Benzene and Xylene (BTEX) gas in the ambient air. Information from the analyzers was reported along with meteorological data to a secured website, and alarm notifications were generated in the event target gases were detected above preset levels. Summary information is included for each beam path. The following report presents the summary results of the measurement period.

Operational Performance Events

As of the end of Q2 2025 the onstream efficiency for the systems was 94.06%.

Maintenance Activities

Routine maintenance and quality assurance/quality control (QA/QC) for the open path UV monitoring systems occurred on 1st, 3rd, 4th, 6th, 10th, 29th, and 30th of April, the 6th, 23rd and 31st of May, and the 1st, 2nd, 10th, 12th, 25th and 30th of June 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-Northwest 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_Q2_2025 |
| Report Title | Quarterly Report – Quarter 2 – 2025 |
| Date Submitted | July 22, 2025 |
| Client | Israel Ministry of Environmental Protection |
| Prepared by | Cary Secrest, Technical Director Email: csecrest@argos-sci.com Signed: <i>Cary Secrest</i> |
| Review by | Amir Sagi Email: samir@bazan.co.il Signed: <i>Amir Sagi</i> |
| Approval | Eliko Angel Email: aeliko@bazan.co.il Signed: <i>Eliko Angel</i> |
| Status | Signed |
| ISRAC ISO/IEC 17025 accreditation | <p>The use of ISRAC symbol relates to tests/calibrations which are included in the organization scope of accreditation and performed according to the accreditation rules as detailed in the accreditation certificate. <u>The scope of accreditation is for Benzene results only</u>; any other information is not part of the accreditation.</p> <p>ISRAC is not responsible for the testing results conducted by the CAB and the CAB's accreditation is not considered as an approval of ISRAC or a different party related to the assessed. ISRAC accreditation is not considered as an approval of either the CAB's procedures or its personnel.</p> <p>This document must be referred to entirely and copying of any part of it to other documents is forbidden.</p> |
| Statement of International Recognition | The Israel Laboratory accreditation authority (ISRAC) is one of the signatories of the International Laboratory Accreditation Cooperation (ILAC) arrangement for the mutual recognition of Testing/Sampling/ Calibration/ Inspection results. |
| Notice | Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document |



does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders September be prosecuted to the fullest extent of the law.

Table of Contents

| | |
|--|----|
| REPORT DETAILS | 3 |
| SECTION 1 – INTRODUCTION | 5 |
| SECTION 2 - QUALITY ASSURANCE QUALITY CONTROL CHECKS | 7 |
| SECTION 3 - SUMMARY OF FIELD DATA..... | 14 |
| UV1 – SUMMARY OF DAILY AVERAGE FIELD DATA | 15 |
| UV2 – SUMMARY OF REALTIME FIELD DATA | 19 |
| UV4 – SUMMARY OF REALTIME FIELD DATA | 23 |
| UV5 – SUMMARY OF REALTIME FIELD DATA | 27 |
| SECTION 4 – SUMMARY NOTES | 32 |



Section 1 – Introduction

The purpose of the Argos open-path UV air monitoring project at the Bazan Refinery in Haifa, Israel is to measure Benzene, Toluene, Ethylbenzene and Xylene (BTEX) gases on a real-time basis and to present this information via a secured website. The system also sends alerts for detection levels defined by Israeli authorities. The fence-line monitoring equipment is installed along four portions of the fence line at the Bazan refinery, these 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 m 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 help locate pollution source direction only on the Fenceline system height.

The second 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 according to EN-16253 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 instrument malfunction or high detections of gases, loss of Internet connections and other issues that might impact on the performance of the monitoring equipment. The support team includes staff scientists who are experts in the field of UV spectroscopy. In addition, each day Argos staff remotely access 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: 1) Real-time website reports "Low Signal" to analyzer. 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 Q2 2025.

Table 2.3: Summary of Q2 2025 Benzene Challenge Gas Checks at UV1

| Date | Times | Expected (ppb) | Measured (ppb) | % Difference | Status |
|------------|-------|----------------|----------------|--------------|--------|
| 03/04/2025 | 12:06 | 12.23 | 12.23 | 0.0002 | Pass |
| 29/04/2025 | 09:22 | 7.85 | 7.918 | 0.86 | Pass |
| 06/05/2025 | 20:28 | 7.85 | 7.88 | 0.14 | Pass |
| 31/05/2025 | 07:40 | 7.85 | 7.70 | 1.91 | Pass |
| 02/06/2025 | 20:12 | 7.85 | 7.24 | 7.71 | Pass |
| 30/06/2025 | 15:51 | 19.88 | 19.87 | 0.04 | Pass |



Table 2.4: Summary of Q2 2025 Benzene Challenge Gas Checks at UV2

| Date | Times | Expected (ppb) | Measured (ppb) | % Difference | Status |
|------------|-------|----------------|----------------|--------------|--------|
| 10/04/2025 | 09:19 | 12.23 | 12.88 | 5.28 | Pass |
| 29/04/2025 | 13:52 | 12.20 | 12.40 | 1.68 | Pass |
| 06/05/2025 | 21:09 | 12.2 | 11.39 | 6.62 | Pass |
| 31/05/2025 | 15:32 | 15.91 | 17.04 | 7.13 | Pass |
| 01/06/2025 | 12:08 | 15.91 | 17.46 | 9.74 | Pass |
| 29/06/2025 | 16:10 | 15.91 | 16.28 | 2.13 | Pass |



Table 2.5: Summary of Q2 2025 Benzene Challenge Gas Checks at UV4

| Date | Times | Expected (ppb) | Measured (ppb) | % Difference | Status |
|------------|-------|----------------|----------------|--------------|--------|
| 01/04/2025 | 19:48 | 12.04 | 11.21 | 6.88 | Pass |
| 30/04/2025 | 12:24 | 3.04 | 3.09 | 1.61 | Pass |
| 06/05/2025 | 21:51 | 3.04 | 3.31 | 8.86 | Pass |
| 31/05/2025 | 11:00 | 3.04 | 3.27 | 7.61 | Pass |
| 01/06/2025 | 14:27 | 3.04 | 2.95 | 2.95 | Pass |
| 28/06/2025 | 20:47 | 6.35 | 6.41 | 0.90 | Pass |



Table 2.6: Summary of Q2 2025 Benzene Challenge Gas Checks at UV5

| Date | Times | Expected (ppb) | Measured (ppb) | % Difference | Status |
|------------|-------|----------------|----------------|--------------|--------|
| 01/04/2025 | 20:44 | 14.47 | 14.62 | 1.02 | Pass |
| 29/04/2025 | 20:30 | 3.44 | 3.46 | 0.50 | Pass |
| 06/05/2025 | 22:33 | 3.44 | 3.62 | 5.35 | Pass |
| 23/05/2025 | 17:03 | 3.44 | 3.15 | 8.29 | Pass |
| 10/06/2025 | 11:00 | 5.79 | 5.72 | 1.30 | Pass |
| 29/06/2025 | 16:13 | 5.79 | 5.86 | 1.21 | 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 Q2 2025 and are shown in Table 2.7 below:

Table 2.7: Minimum Detection Limits for Systems for Q2 2025

| Location | April MDL (ppb) | May MDL (ppb) | June MDL (ppb) |
|----------|-----------------|---------------|----------------|
| UV_1 | 0.30 | 0.22 | 0.13 |
| UV_2 | 0.49 | 0.39 | 0.23 |
| UV_4 | 0.26 | 0.30 | 0.24 |
| UV_5 | 0.20 | 0.14 | 0.07 |



Section 3 - Summary of Field Data

As mentioned in Section 1, the air monitoring equipment operated continuously during Q2 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 | 04/01/2025 | 06/30/2025 | 87.47 |
| UV2 | 04/01/2025 | 06/30/2025 | 93.83 |
| UV4 | 04/01/2025 | 06/30/2025 | 91.09 |
| UV5 | 04/01/2025 | 06/30/2025 | 95.18 |

There was a power outage at UV2 for 1 day and at UV1 for 1 week. UV4 had spectrometer connectivity issues.

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 Q2 2025

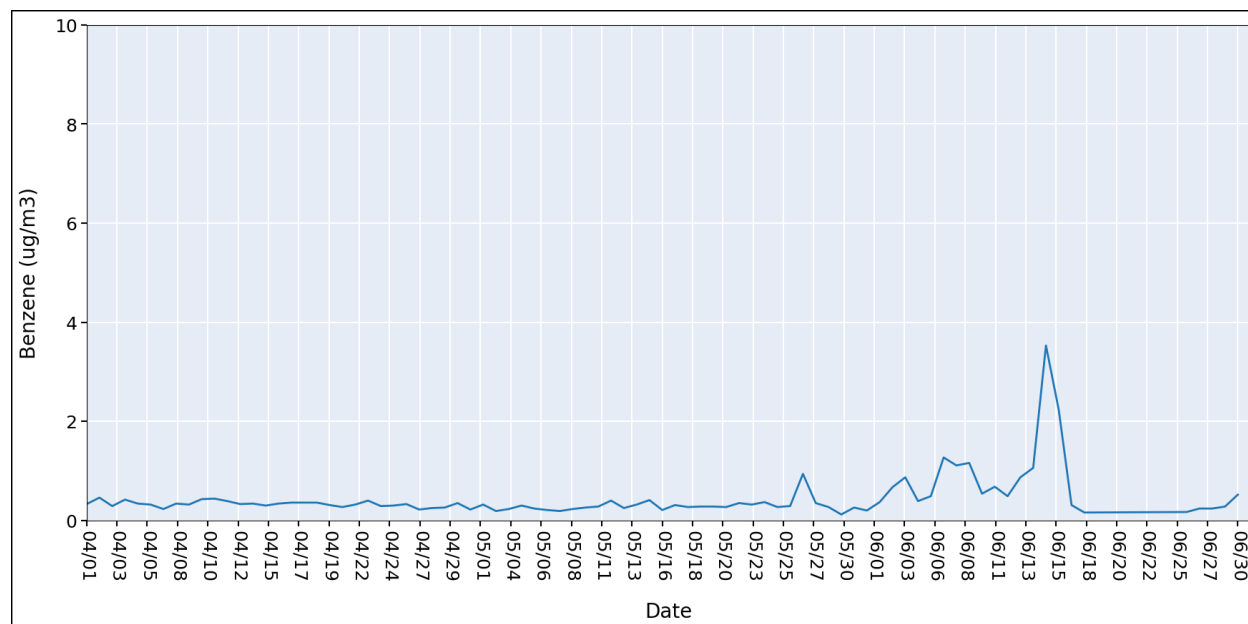




Figure 3.2 – Toluene 24 Hour Average Data for UV1 for Q2 2025

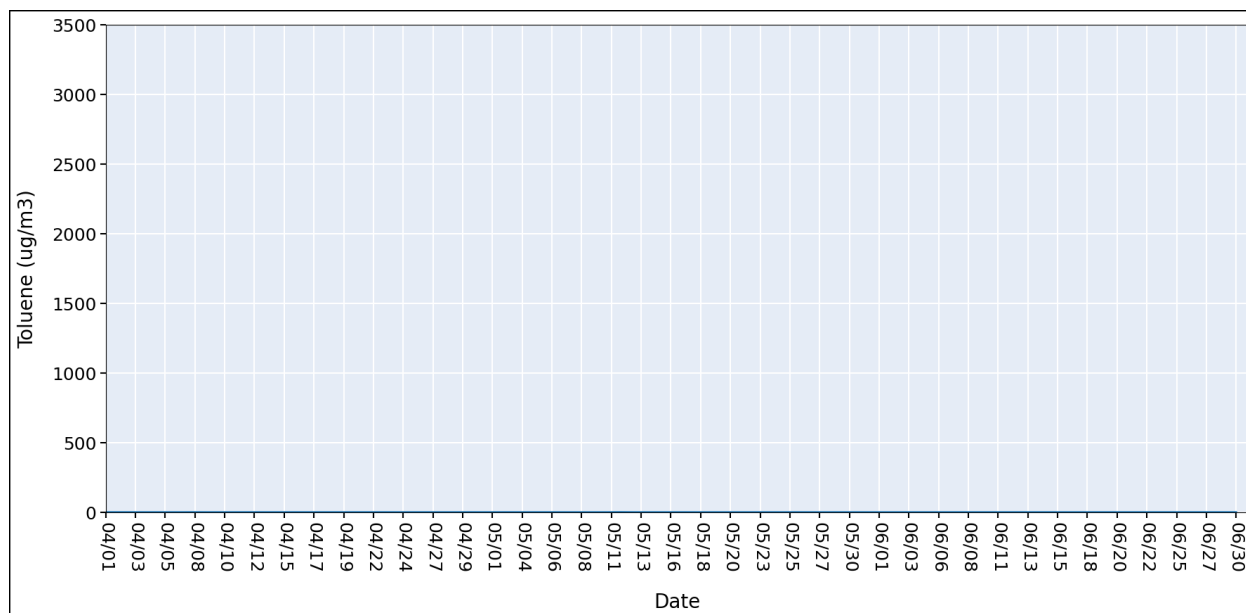




Figure 3.3 – Xylene 24 Hour Average Data for UV1 for Q2 2025

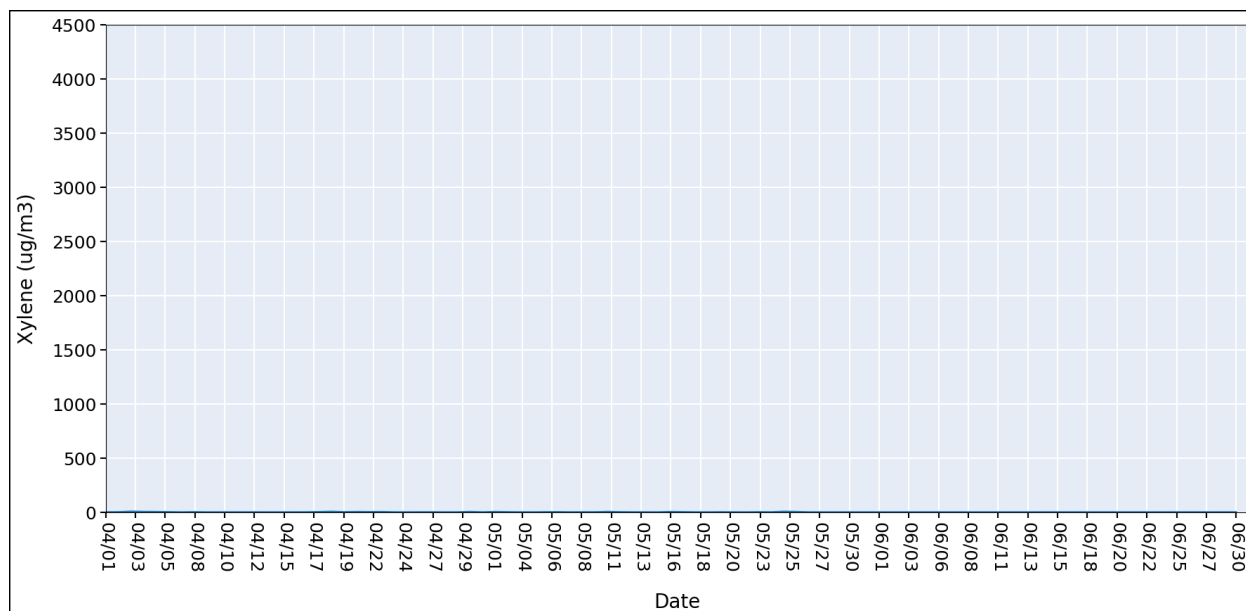


Figure 3.4 - Ethyl Benzene 24 Hour Average Data for UV1 for Q2 2025

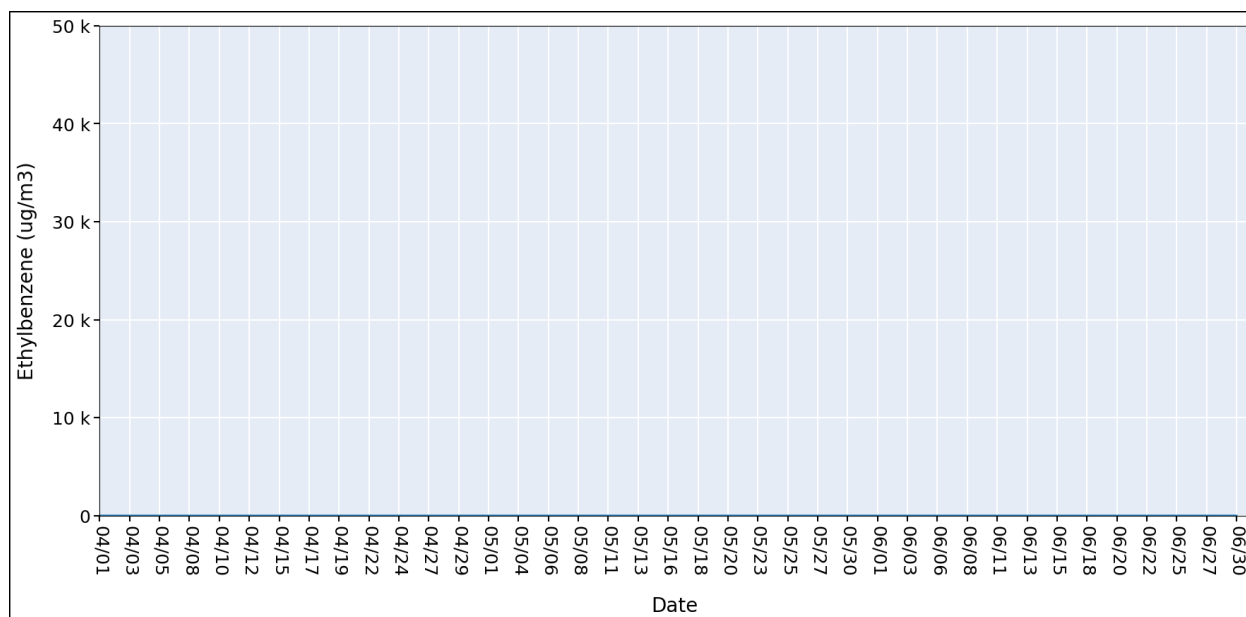
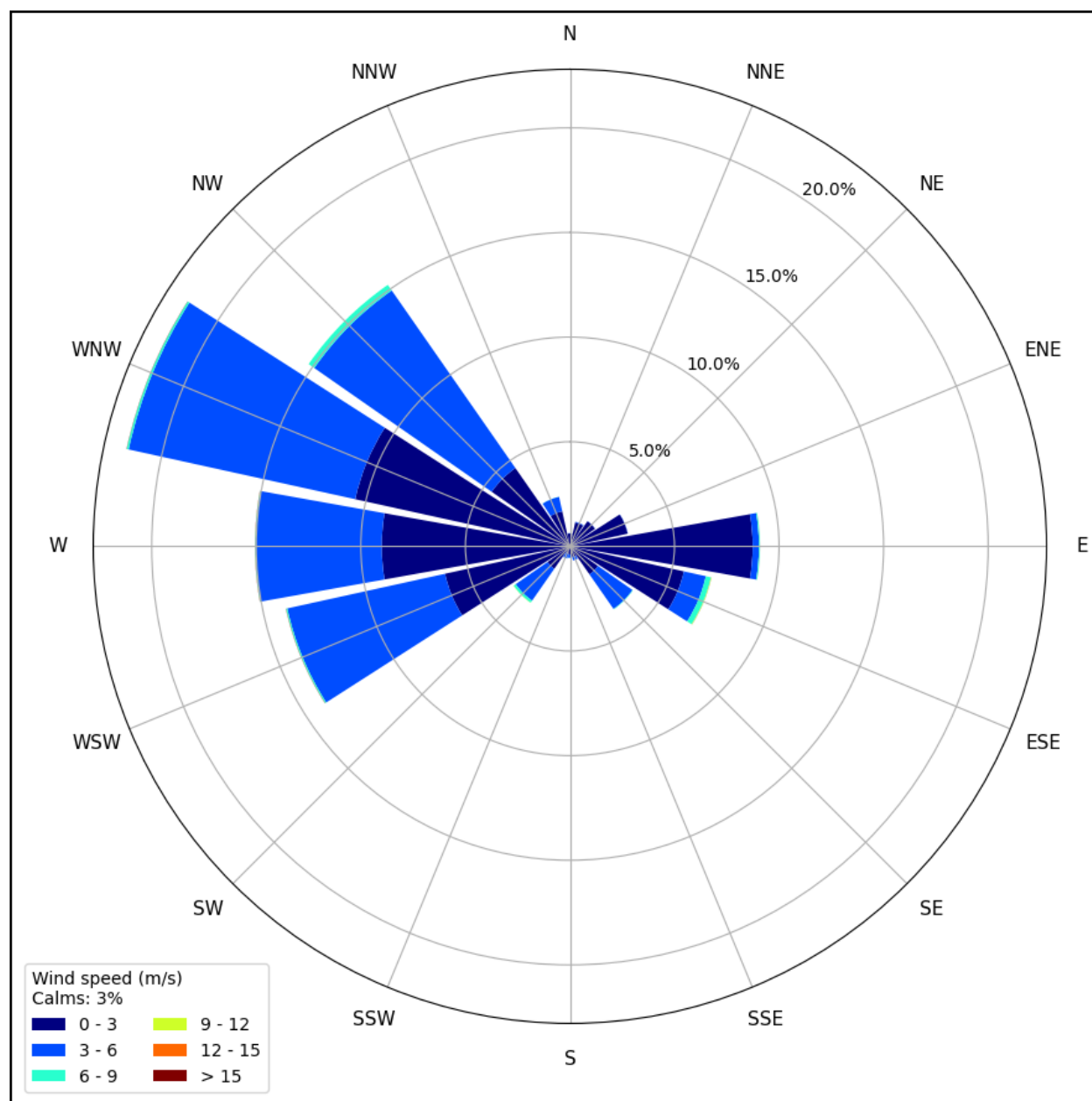


Figure 3.5 – Wind Speed and Wind Direction for UV1 for Q2 2025





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 Q2 2025

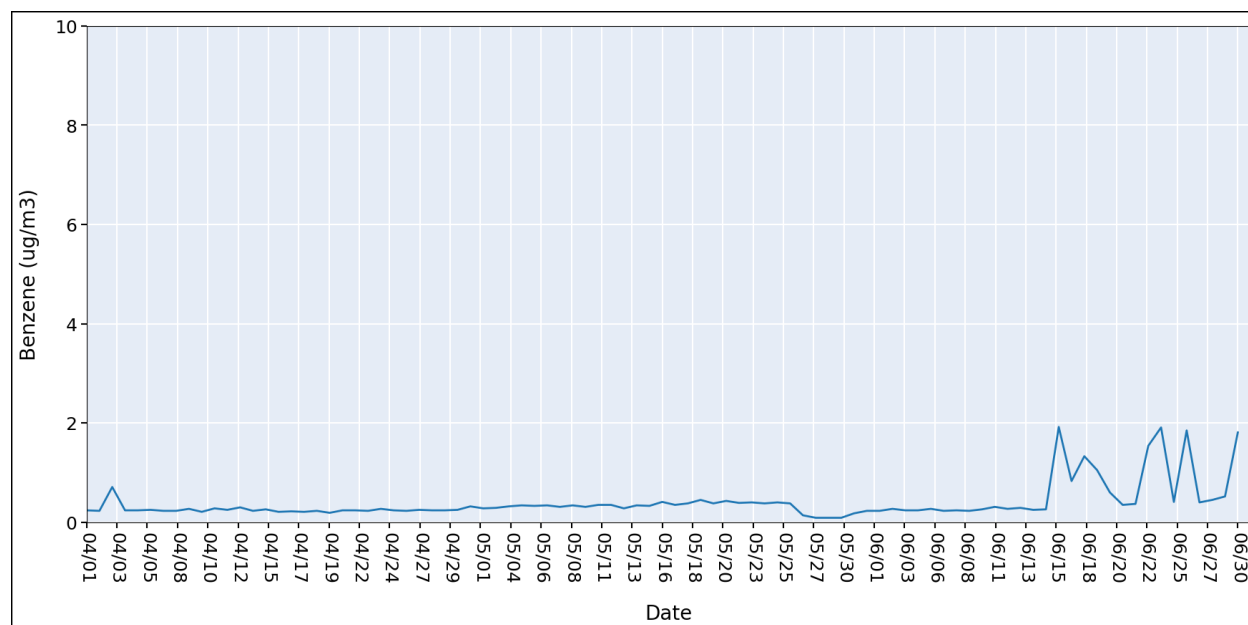




Figure 3.7 – Toluene 24 Hour Average Data for UV2 for Q2 2025

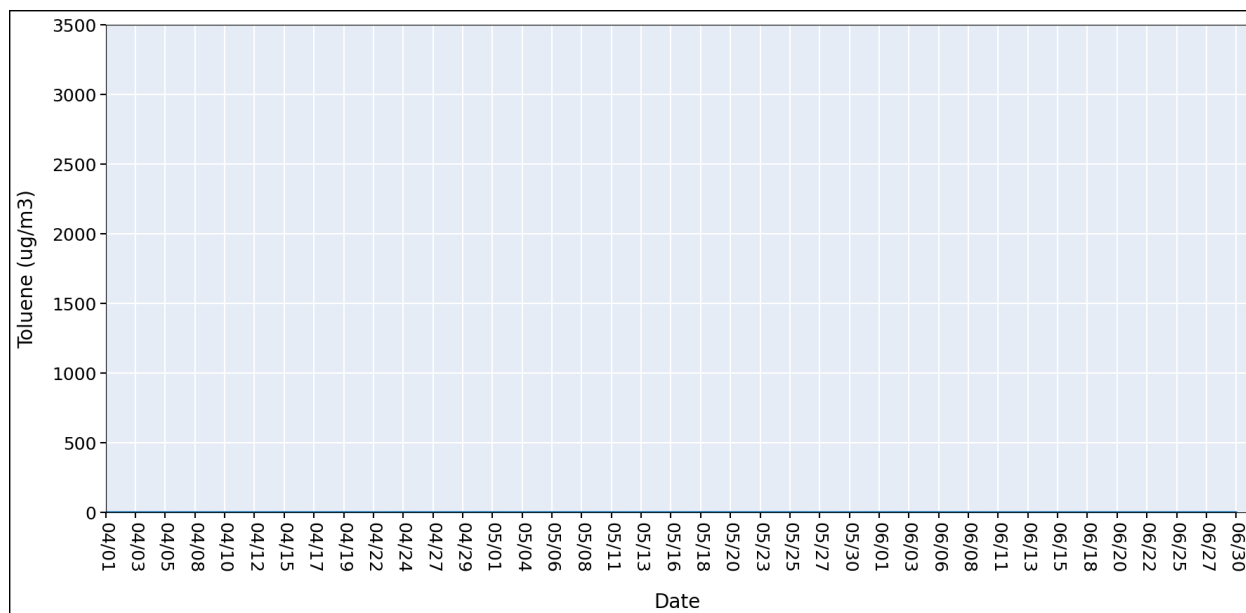




Figure 3.8 – Xylene 24 Hour Average Data for UV2 for Q2 2025

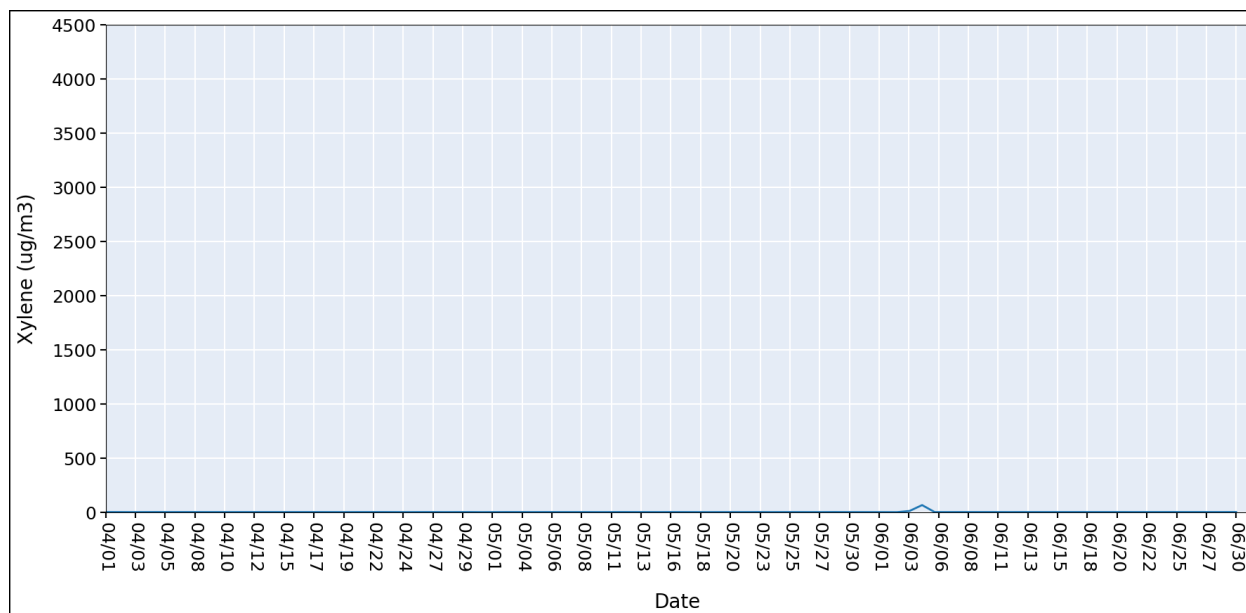


Figure 3.9 – Ethyl Benzene 24 Hour Average Data for UV2 for Q2 2025

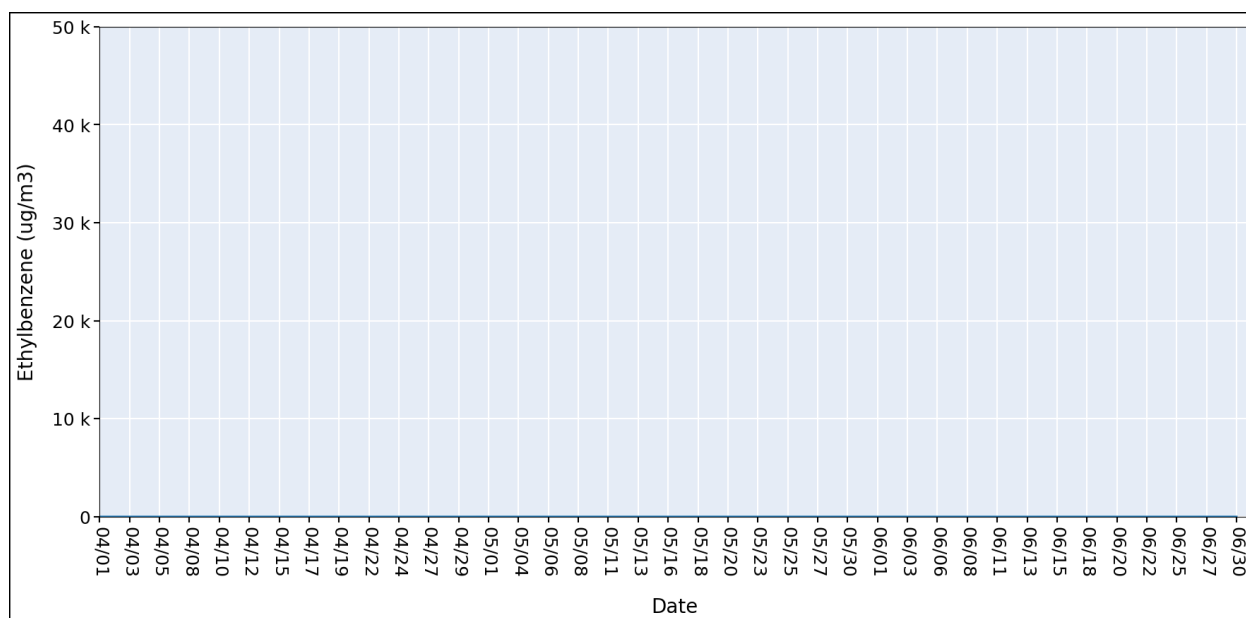
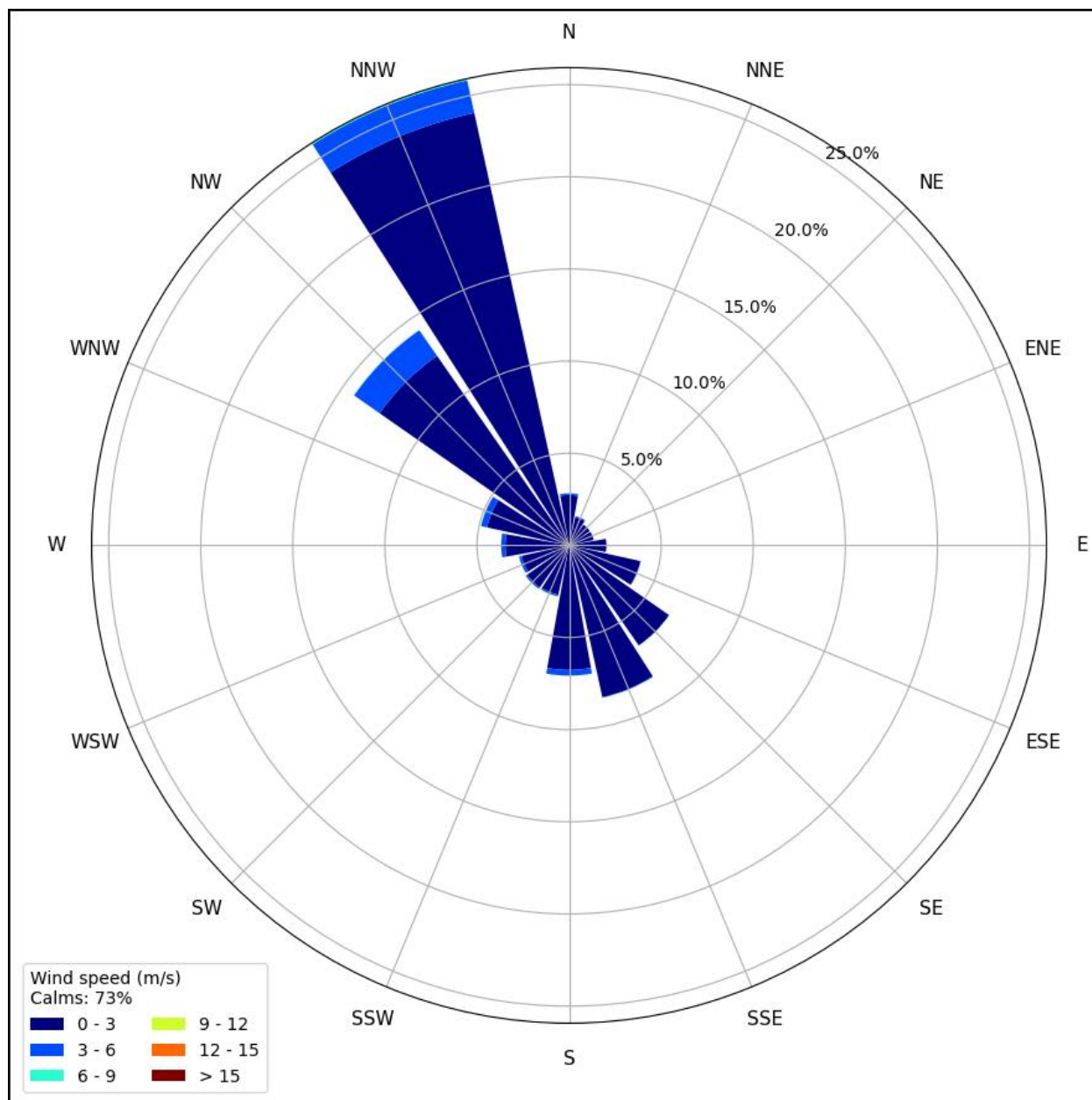


Figure 3.10 – Wind Speed and Wind Direction for UV2 for Q2 2025





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 Q2 2025

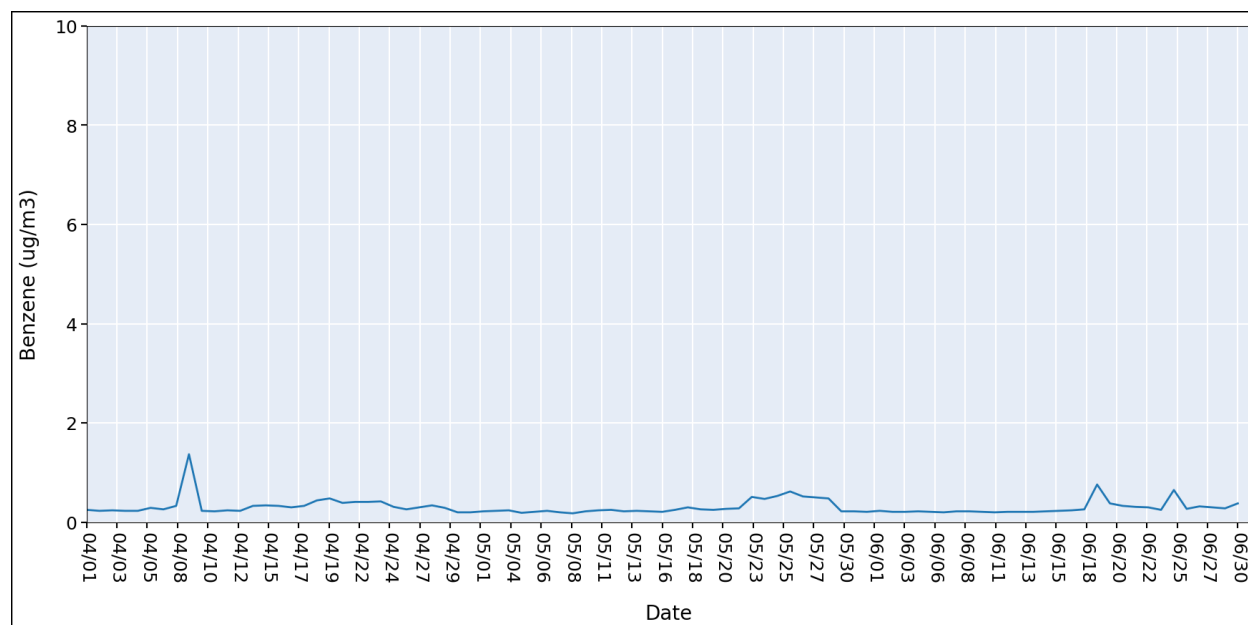




Figure 3.12 – Toluene 24 Hour Average Data for UV4 for Q2 2025

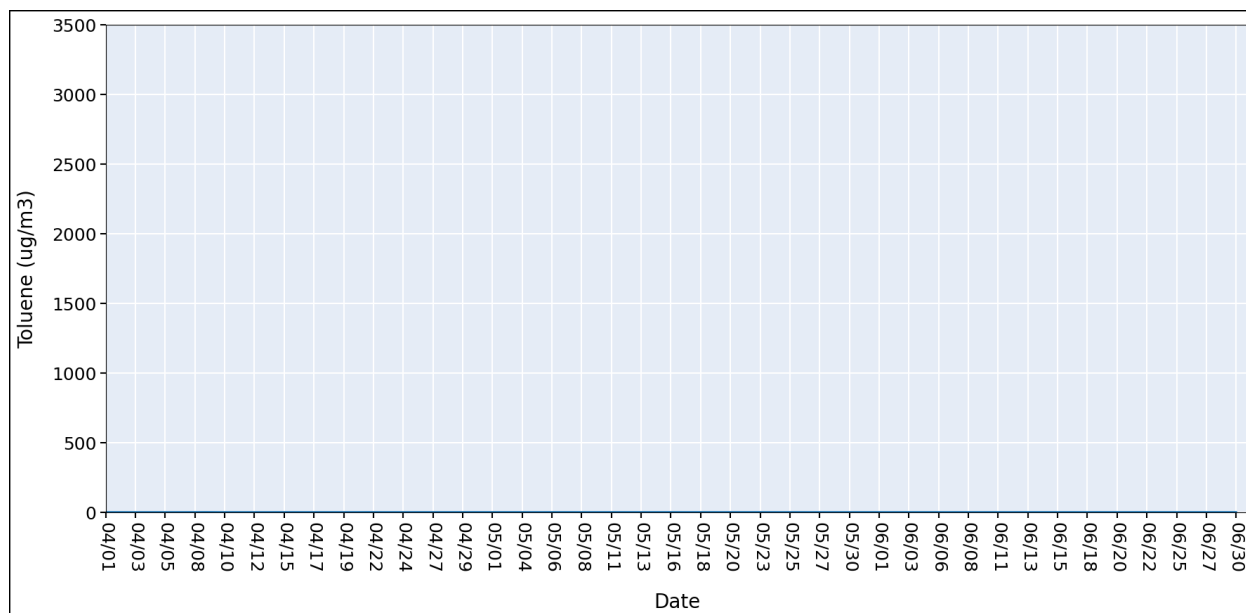




Figure 3.13 – Xylene 24 Hour Average Data for UV4 for Q2 2025

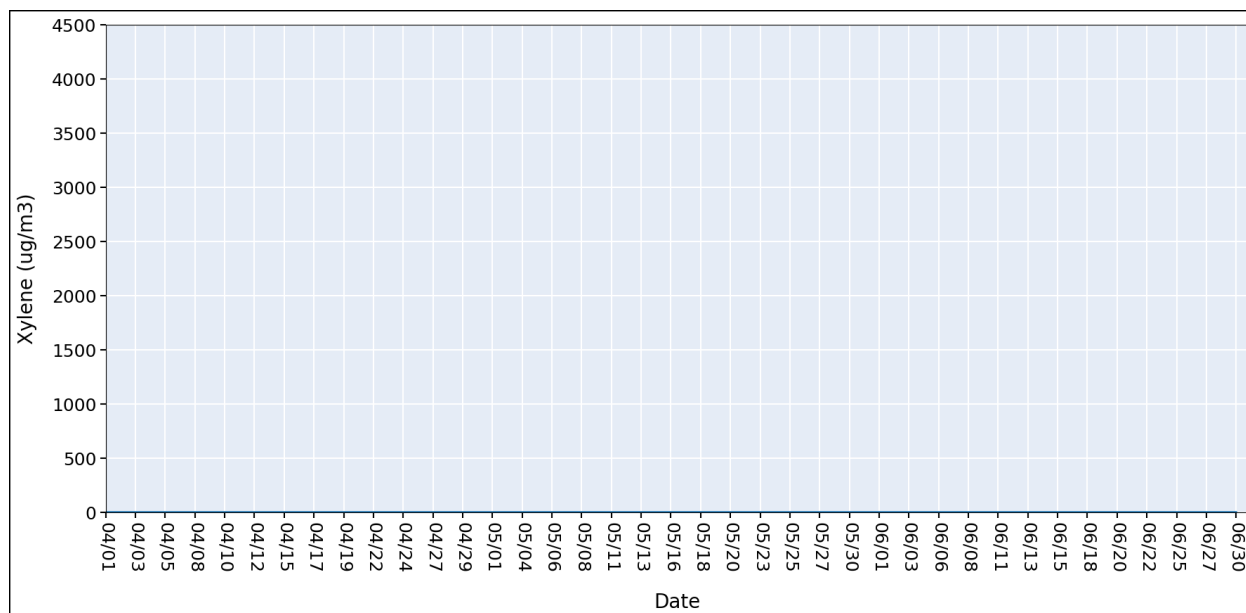


Figure 3.14 – Ethyl Benzene 24 Hour Average Data for UV4 for Q2 2025

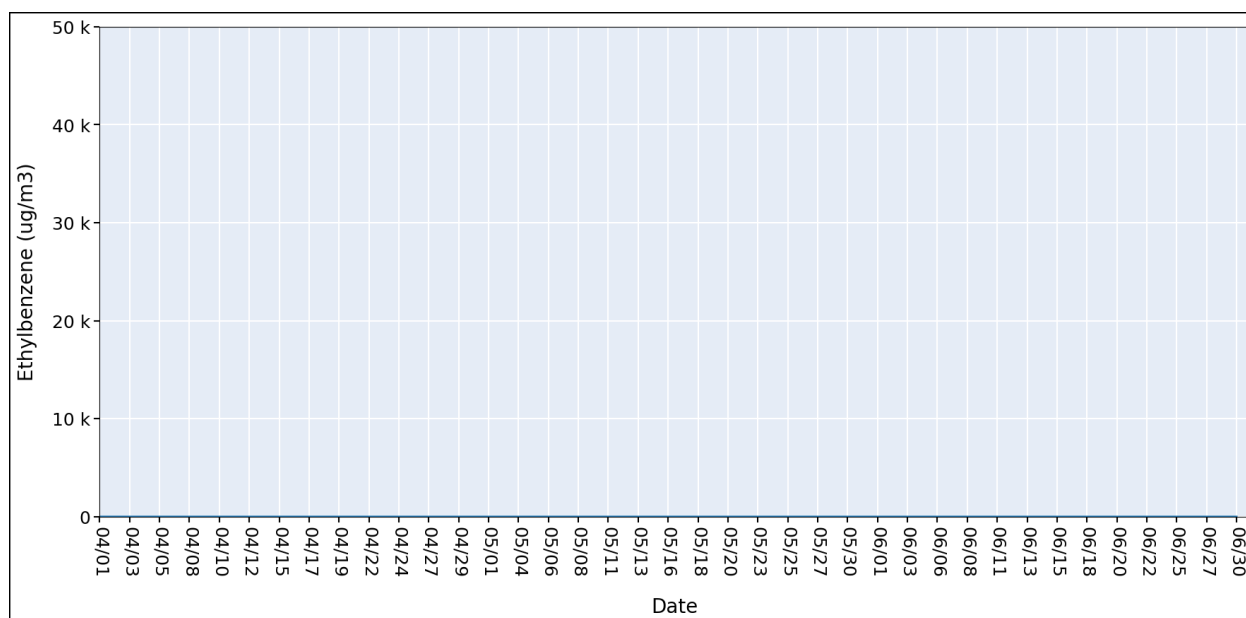
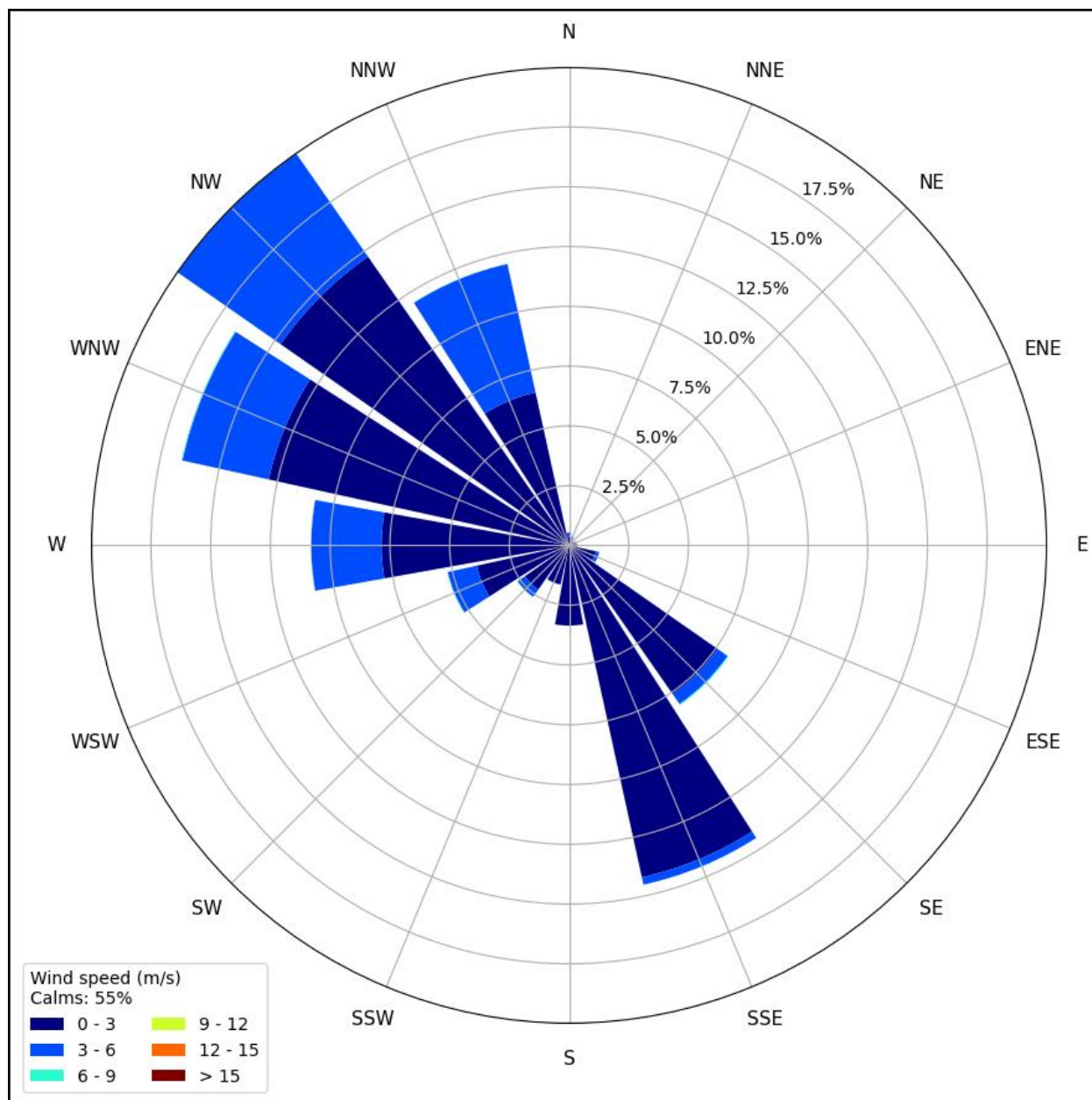


Figure 3.15 – Wind Speed and Wind Direction for UV4 for Q2 2025





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 Q2 2025

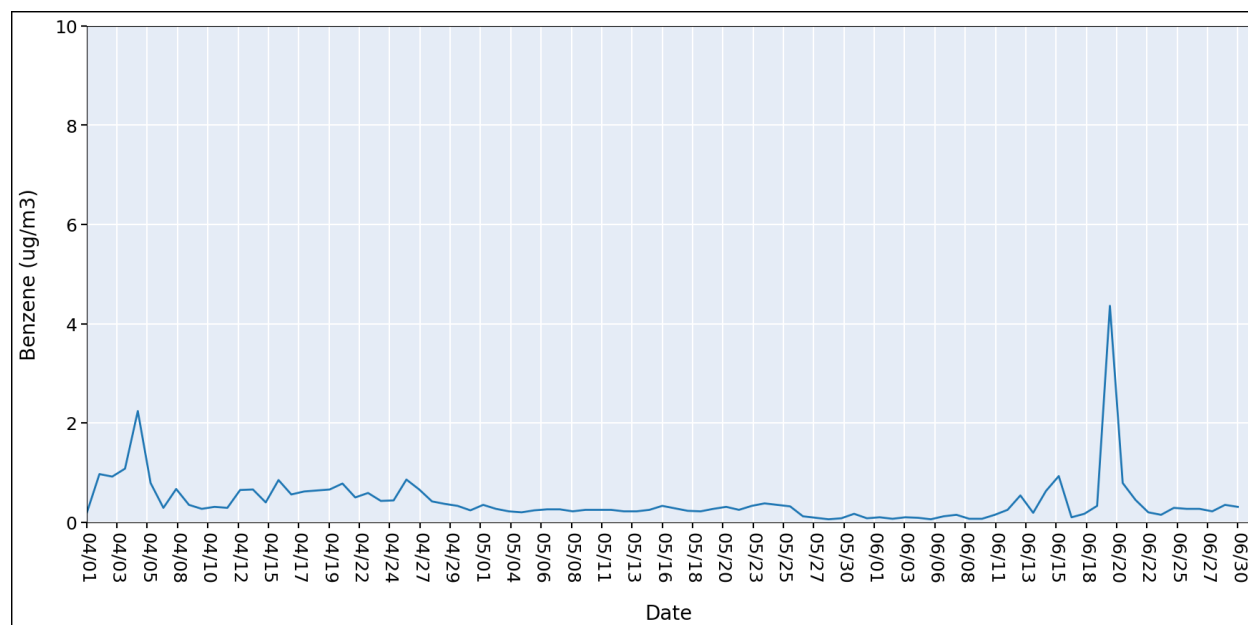




Figure 3.17 – Toluene 24 Hour Average Data for UV5 for Q2 2025

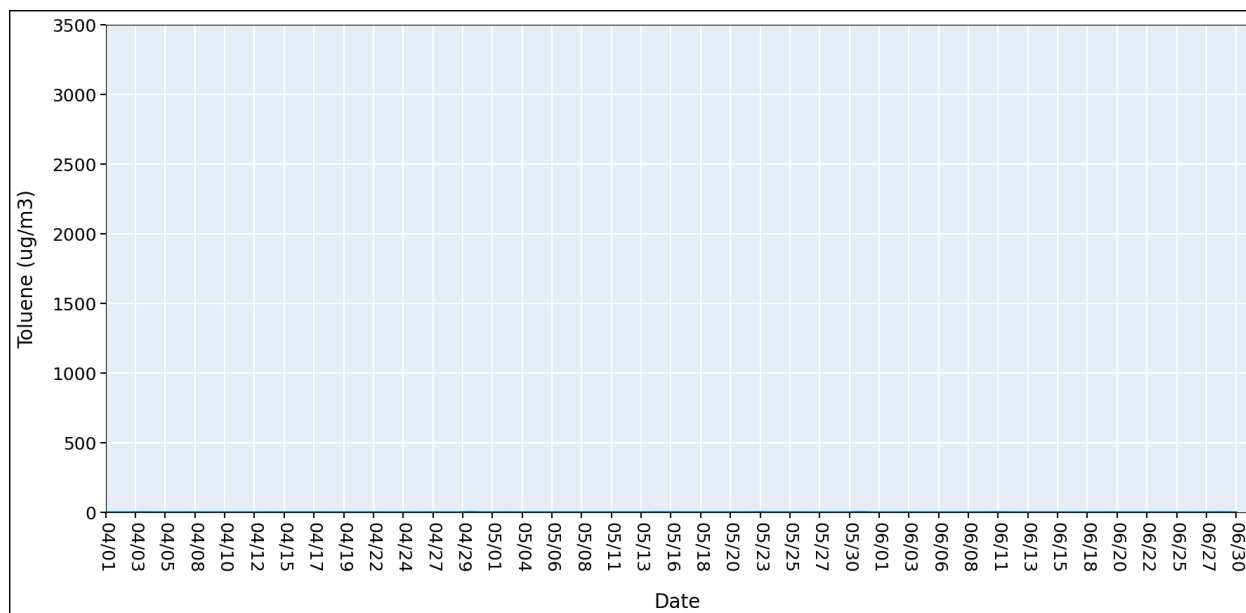




Figure 3.18 – Xylene 24 Hour Average Data for UV5 for Q2 2025

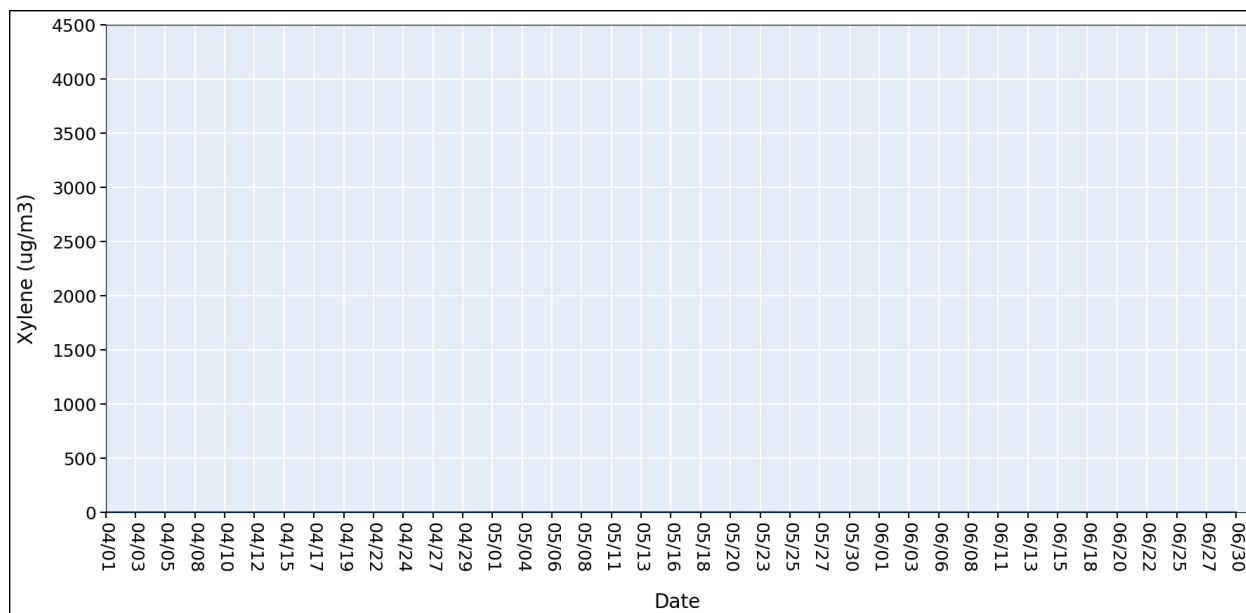


Figure 3.19 – Ethyl Benzene 24 Hour Average Data for UV5 for Q2 2025

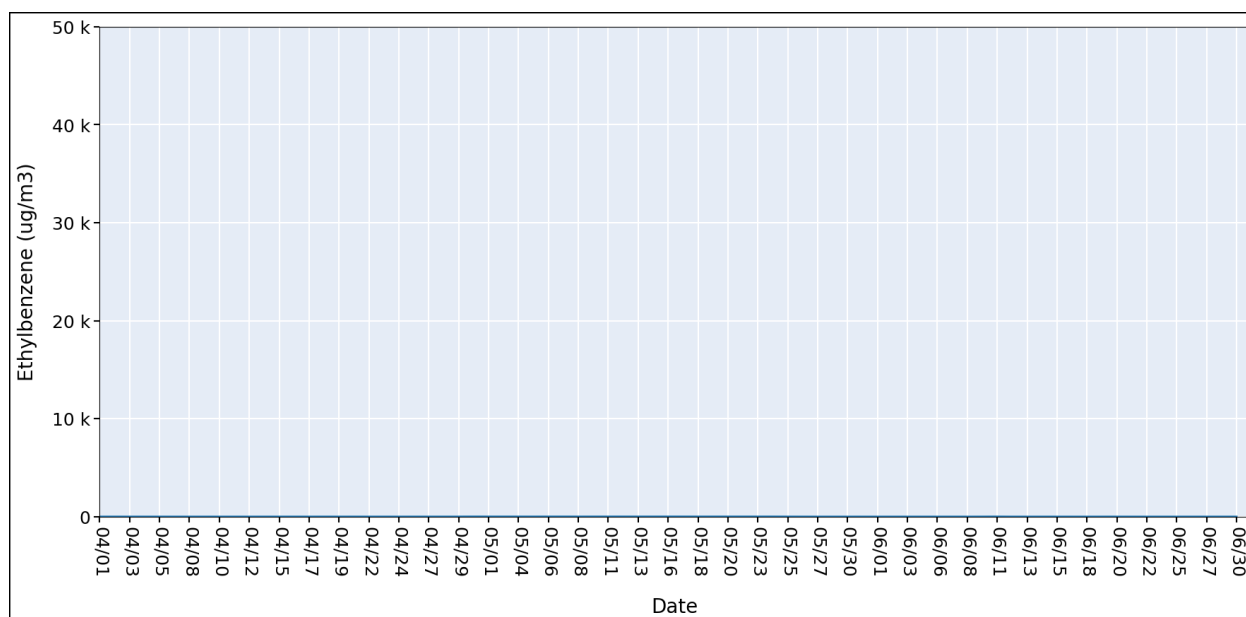
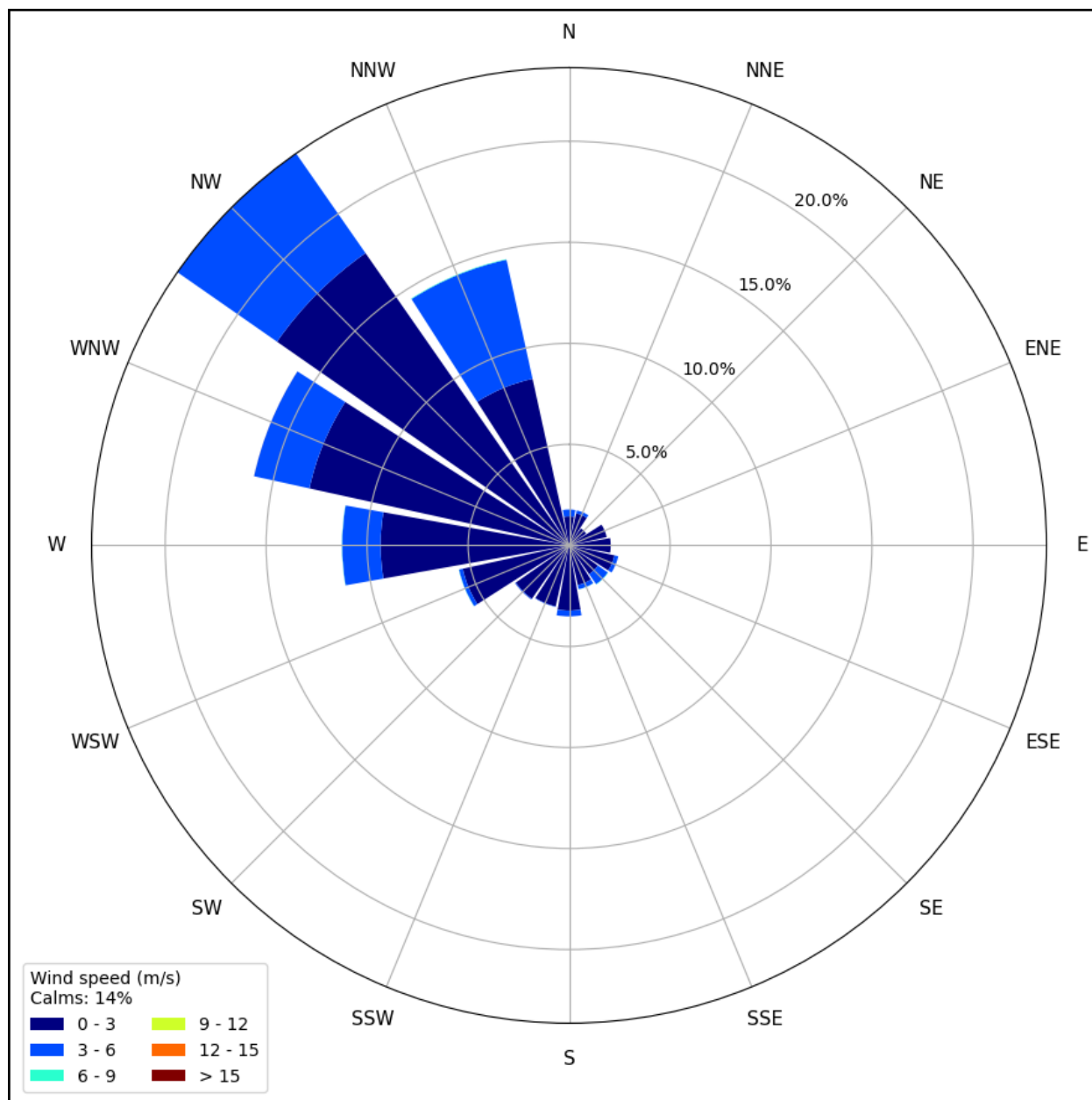


Figure 3.20 – Wind Speed and Wind Direction Data for UV5 for Q2 2025





The 24-hr alarm level was exceeded for benzene during Quarter 2 2025:

- UV5 recorded 4.36 ug/m3 on June 20, 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-Northwest 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

Calibration Cell Serial # BENZ001

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)


Calibrated with 8.0 ppm-m Reference Standard

Calibration Cell Concentration: **6.81 ppm-m**

Lower 95% confidence: 5.97 ppm-m

Correlation Coefficient: 0.96

Upper 95% confidence: 7.65 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: May 10, 2025

KJK Photonics, LLC.



Certificate of Calibration

Calibration Cell Serial # BENZ002

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)

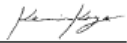
Calibrated with 4.0 ppm-m Reference Standard

Calibration Cell Concentration: **5.22 ppm-m**

Lower 95% confidence: 4.58 ppm-m

Correlation Coefficient: 0.91

Upper 95% confidence: 5.87 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: May 10, 2025

KJK Photonics, LLC.



Certificate of Calibration

Calibration Cell Serial # BENZ003

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)

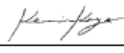
Calibrated with 2.0 ppm-m Reference Standard

Calibration Cell Concentration: **2.50 ppm-m**

Lower 95% confidence: 2.19 ppm-m

Correlation Coefficient: 0.78

Upper 95% confidence: 2.81 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: May 10, 2025

KJK Photonics, LLC.



Certificate of Calibration

Calibration Cell Serial # BENZ004

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)


Calibrated with 2.0 ppm-m Reference Standard

Calibration Cell Concentration: **1.07 ppm-m**

Lower 95% confidence: 0.94 ppm-m

Correlation Coefficient: 0.90

Upper 95% confidence: 1.20 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: May 10, 2025

KJK Photonics, LLC.



Certificate of Calibration

Calibration Cell Serial # BENZ005

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)

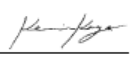
Calibrated with 2.0 ppm-m Reference Standard

Calibration Cell Concentration: **1.80 ppm-m**

Lower 95% confidence: 1.59 ppm-m

Correlation Coefficient: 0.91

Upper 95% confidence: 2.01 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: May 10, 2025

KJK Photonics, LLC.



Certificate of Calibration

Calibration Cell Serial # BENZ006

This calibration cell was individually calibrated by spectroscopic analysis using ultra-violet cross sections for benzene as referenced by:

B. Trost, J. Stutz, and U. Platt, "UV-absorption cross sections of a series of monocyclic aromatic compounds", Atmos. Environ. 31, 3999-4008 (1997); DOI: 10.1016/S1352-2310(97)00214-8

COMMENTS: Absorption measurements using a 0.5 m Czerny-Turner spectrometer coupled with a photodiode array detector (spectral resolution 0.11 nm)

Calibrated with 4.0 ppm-m Reference Standard

Calibration Cell Concentration: **17.24 ppm-m**

Lower 95% confidence: 15.00 ppm-m

Correlation Coefficient: 0.97

Upper 95% confidence: 19.60 ppm-m

Senior Spectroscopist: Kevin Kaye  Date: June 15, 2025

KJK Photonics, LLC.

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