



Annual Report Fence Line Monitoring Report for the Bazan Fence Line Monitoring System- 2024



February 2025
Bazan Group
Haifa, Israel

Subject: Annual 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 January to December 2024. 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 measurements.

Operational Performance Events

As of the end of 2024 the year-to-date onstream efficiency for the systems was 97.48 %.


Summary Findings

From the results in Section 3 below 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.
- UV2 had the highest annual average for benzene of $0.58 \mu\text{g}/\text{m}^3$.
- The most daily average exceedances of the $3.9 \mu\text{g}/\text{m}^3$ benzene alarm value was at UV2 (1 day).

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

Report Details

Reference	Bazan_Annual_2024
Report Title	Annual Report Fence Line Monitoring Report for the Bazan Fence Line Monitoring System- 2024
Date Submitted	12 February 2025
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Status	Signed
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Table of Contents

REPORT DETAILS	2
SECTION 1 – INTRODUCTION	4
SECTION 2 - QUALITY ASSURANCE QUALITY CONTROL CHECKS	6
SECTION 3 - SUMMARY OF FIELD DATA.....	8
SECTION 4 – SUMMARY NOTES	14
SECTION 5 – ANNEXES.....	15

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 meteorological station is to help locate pollution source direction only on the Fenceline system height.

The annual summary of the measurements performed by the system for 2024 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 method for analysis of benzene was validated against the requirements of US EPA Method 301. These requirements are shown in Table 2.1 below.

Table 2.1 – Validation Parameters for UV Systems

Parameter	Method Acceptable	Site specific Method Acceptable	Unacceptable
Relative Bias	$\leq 10 \%$	Between 10 % and 30 %	$> 30 \%$
Precision	Relative Standard Deviation (RSD) $\leq 20 \%$		RSD $> 20 \%$
MDL	N/A	N/A	N/A
Accuracy	$\leq 15 \%$		$> 15 \%$
Linearity	$R^2 \geq 0.9$		$R^2 < 0.9$
Robustness Temperature	$\leq 15 \%$		$> 15 \%$
Robustness Signal Strength	$\leq 15 \%$		$> 15 \%$
Robustness Sample Time	$\leq 15 \%$		$> 15 \%$

Table 2.2 shows the overall results of the validation checks as a summary of all the systems.

Table 2.2 – Results of Validation for all UV Systems

Parameter	Value	Status
Relative Bias	4.19%	Method Acceptable
Precision	6.08%	Method Acceptable
MDL	0.2-0.97 ppb	N/A
Accuracy	7.15%	Method Acceptable
Linearity	$R^2 = 0.9927$	Method Acceptable
Robustness Temperature	2.26%	Method Acceptable
Robustness Signal Strength	6.51%	Method Acceptable
Robustness Sample Time	8.34%	Method Acceptable

Section 3 - Summary of Field Data

As mentioned in Section 1, the air monitoring equipment operated continuously during 2024. 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 – Summary of Onstream Efficiency for 2024

Location	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	Annual (%)
UV_1	99.60	96.49	96.82	95.17	97.0
UV_2	99.69	97.79	97.15	96.61	97.79
UV_4	97.96	98.96	99.51	97.12	98.39
UV_5	99.85	96.88	94.84	95.54	96.74

A summary of the 2024 data is shown in Tables 3.2 and 3.3 below:

Table 3.2 – Annual Average Benzene Concentrations per Site for 2024

Location	Benzene ($\mu\text{g}/\text{m}^3$)	Uncertainty of Measurement (%)
UV_1	0.3325	8.524
UV_2	0.5767	16.429
UV_4	0.3422	14.489
UV_5	0.4528	16.479

Table 3.3 – Annual Average Toluene, Xylene and Ethyl Benzene Concentrations per Site for 2024

Location	Toluene ($\mu\text{g}/\text{m}^3$)	Xylene ($\mu\text{g}/\text{m}^3$)	Ethyl Benzene ($\mu\text{g}/\text{m}^3$)
UV_1	0.6852	3.067	1.810
UV_2	2.083	0.8246	1.699
UV_4	0.8667	0.7065	1.976
UV_5	0.8351	1.306	7.286

The table below shows the number of daily average exceedances in 2024 of the following:

- Benzene: 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).

Table 3.3 – Number of Daily Average Exceedances Average Benzene Concentrations per Site for 2024

Location	Benzene (Days)	Toluene (Days)	Xylene (Days)
UV_1	0	0	0
UV_2	1	0	0
UV_4	0	0	0
UV_5	0	0	0

Figures 3.1 to 3.4 show the annual wind roses at each of the paths for 2024

Figure 3.1 – Wind Speed and Wind Direction for UV1 for 2024

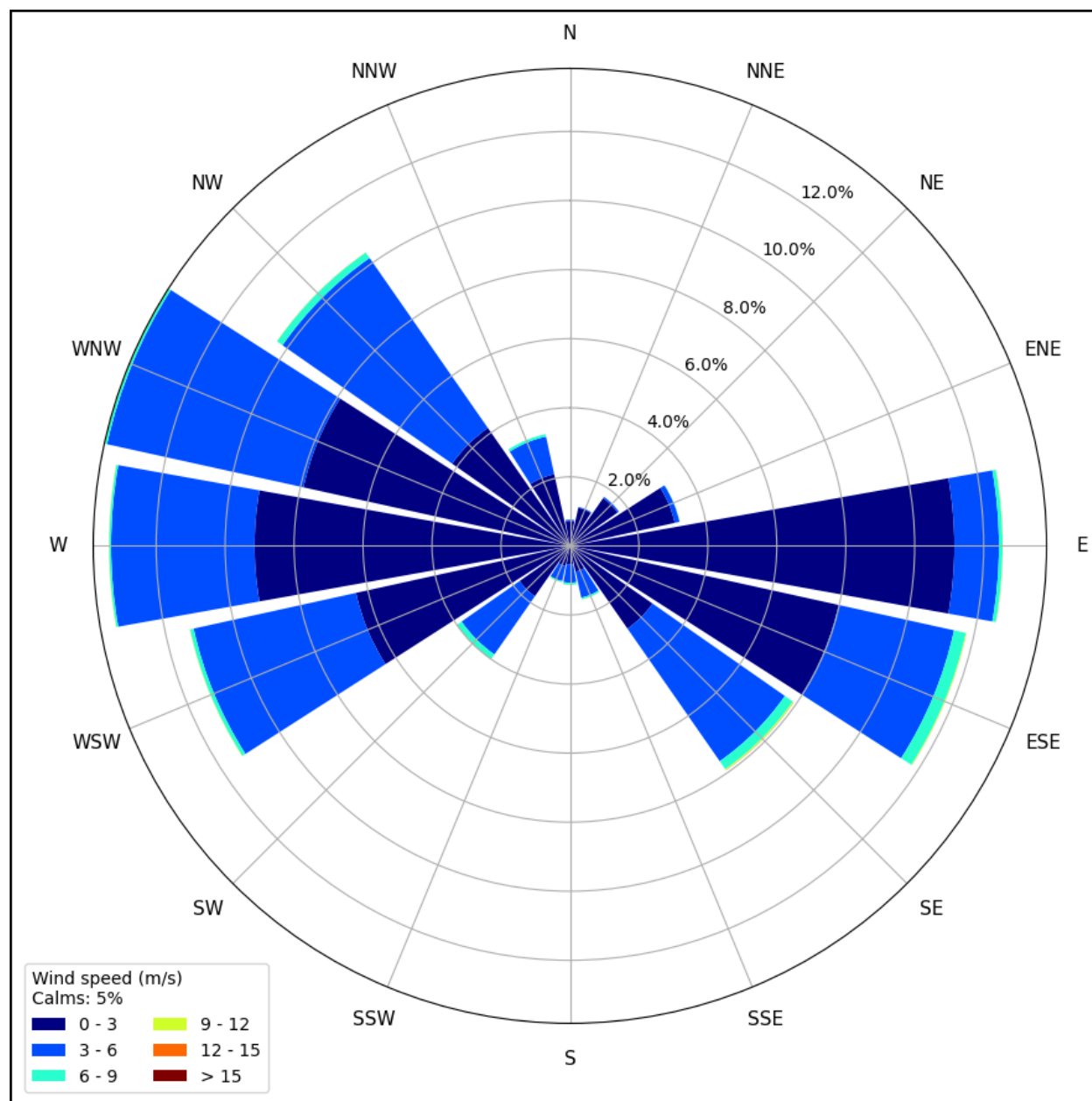


Figure 3.2 – Wind Speed and Wind Direction for UV2 for 2024

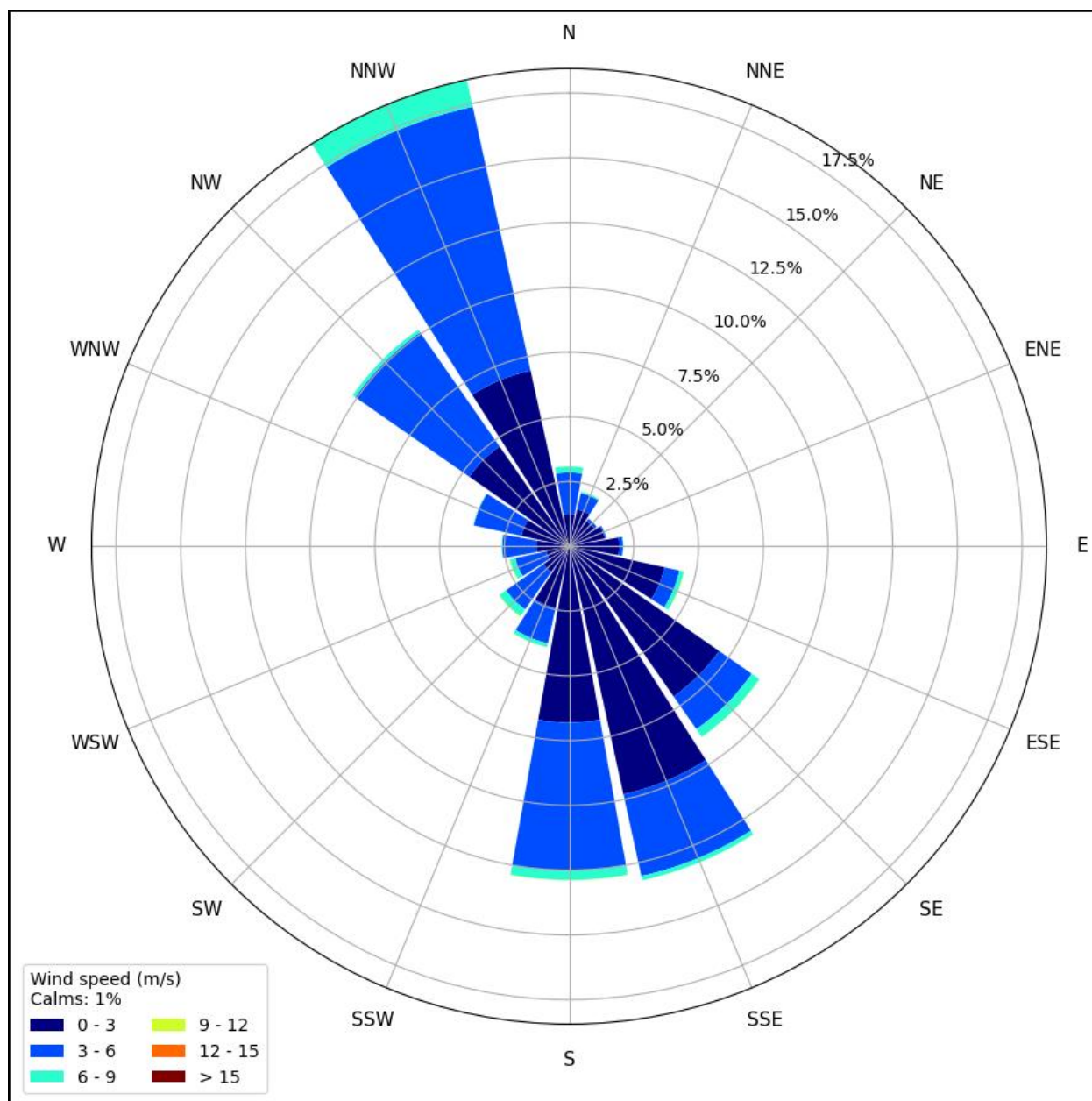


Figure 3.3 – Wind Speed and Wind Direction for UV4 for 2024

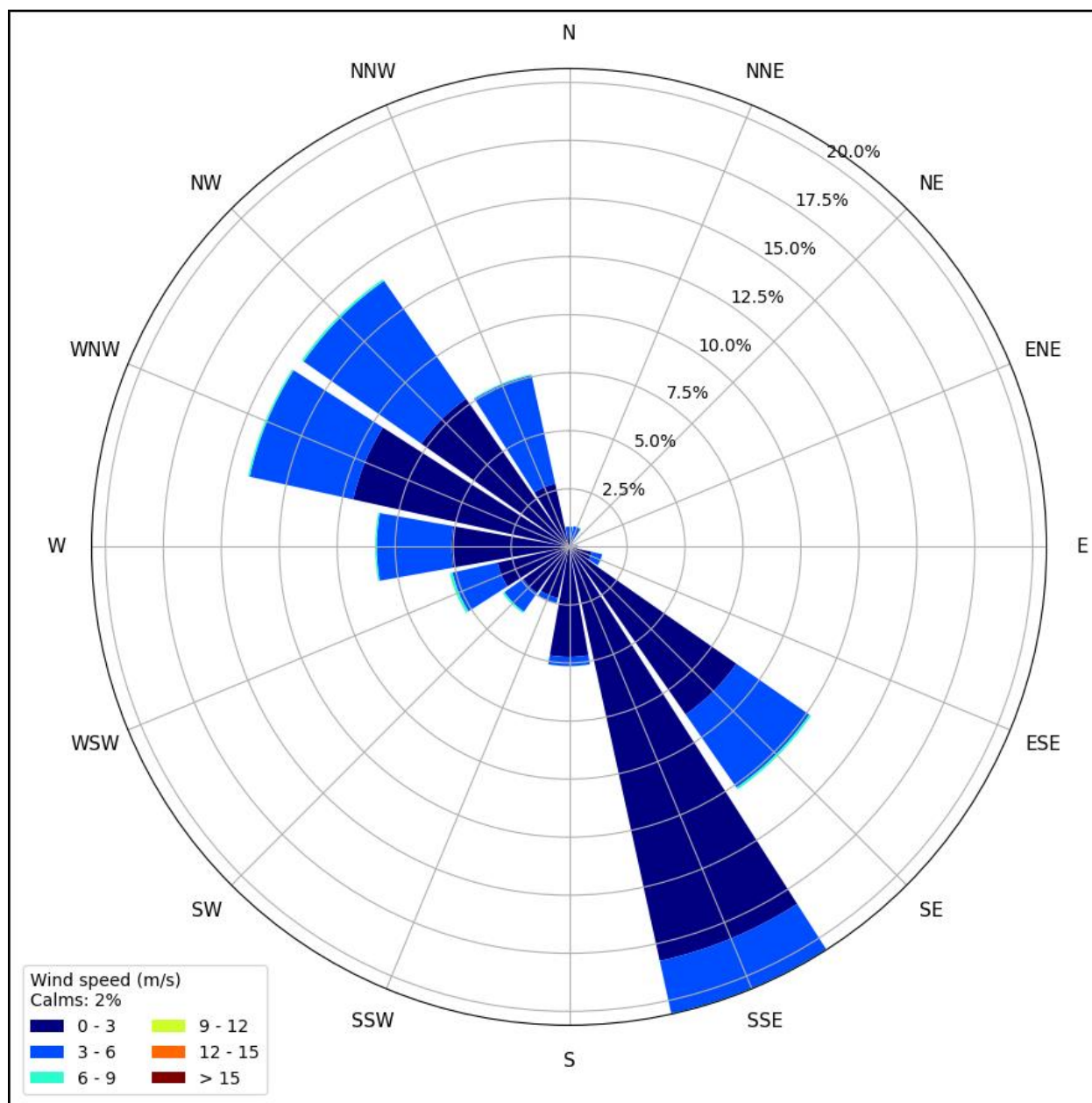
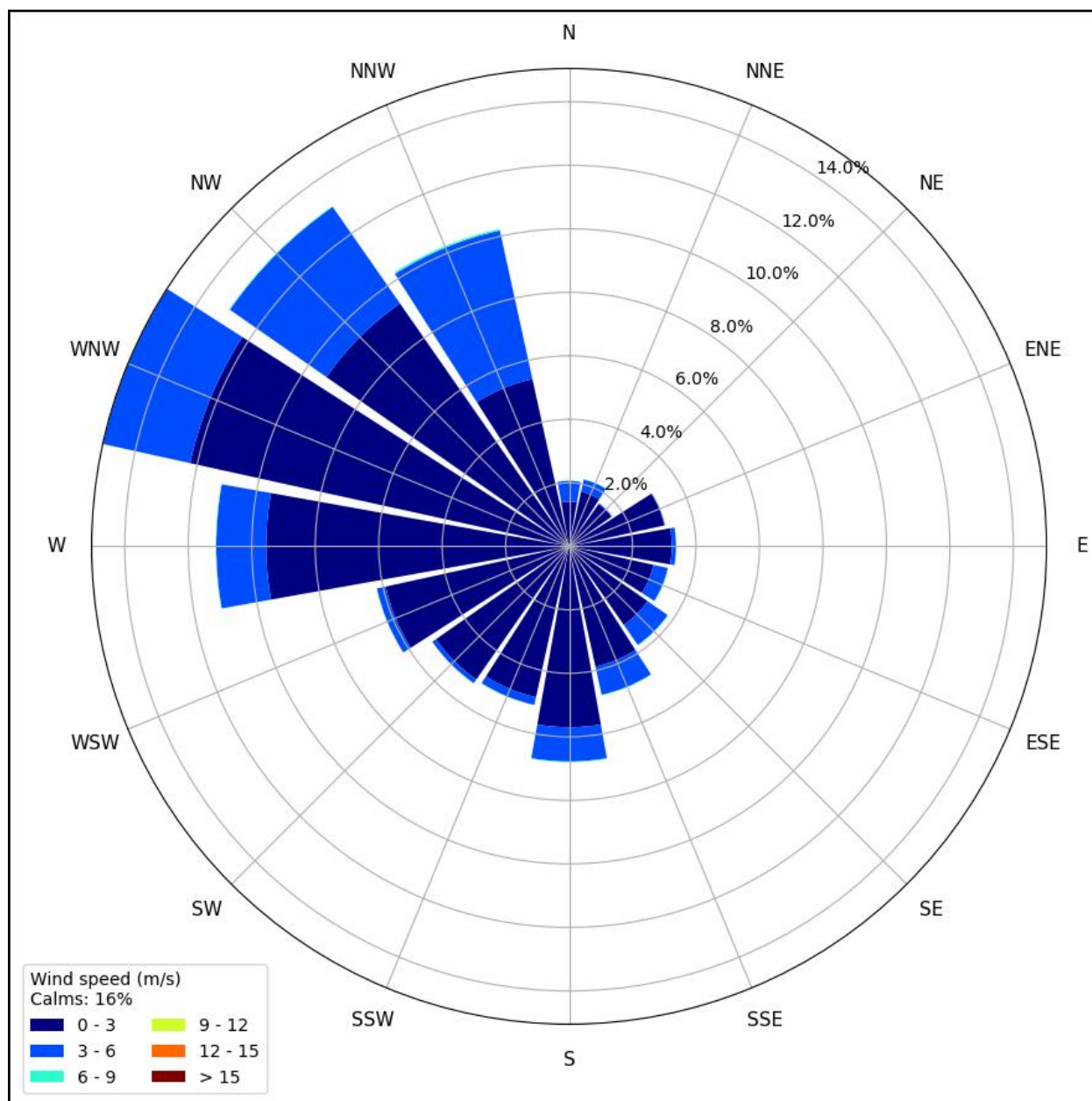


Figure 3.4 – Wind Speed and Wind Direction Data for UV5 for 2024



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.
- UV2 had the highest annual average for benzene of $0.57 \mu\text{g}/\text{m}^3$.
- The most daily average exceedances of the $3.9 \mu\text{g}/\text{m}^3$ benzene alarm value was at UV2 (1 day).

Section 5 – Annexes

Bias results

Bias	-0.455				
SDd	0.776				
t-test	2.555	< 2.571 means statistically insignificant			
Relative Bias UV1	3.944	<=10%			
Relative Bias UV2	5.897	<=10%			
Relative Bias UV4	3.777	<=10%			
Relative Bias UV5	3.142	<=10%			

Date	File number	Background File no	System	Concentration (ppb)	Expected Conc (ppb)	difference between spiked and unspiked samples
4/16/2024 7:44:23 PM	317660	Argos-4/16/2024	UV1	-0.52129	0	
4/27/2024 2:12:02 AM	320460	Argosqa-4/27/2024	UV1	-0.22014	0	
4/16/2024 8:10:51 PM	317671	Argosqa-4/16/2024	UV1	11.42331	11.53	
4/27/2024 2:15:28 AM	320465	Argosqa-4/27/2024	UV1	11.89371	11.53	0.499225
12/30/2024 21:03	428247	428246	UV2	7.76691	7.71	
12/30/2024 21:04	428248	428246	UV2	7.7936	7.71	
12/30/2024 21:07	428249	428246	UV2	0.24673	0	
12/30/2024 21:08	428250	428246	UV2	0.9104	0	-0.50831
12/30/2024 21:10	428251	428246	UV2	7.32489	7.71	
12/30/2024 21:11	428252	428246	UV2	7.8474	7.71	
12/30/2024 21:12	428253	428246	UV2	0.31122	0	
12/30/2024 21:14	428254	428246	UV2	0.34123	0	-0.45008
12/30/2024 21:15	428255	428246	UV2	8.21493	7.71	
12/30/2024 21:16	428256	428246	UV2	7.75042	7.71	
12/30/2024 21:19	428257	428246	UV2	0.2079	0	
12/30/2024 21:20	428258	428246	UV2	0.12573	0	0.10586
12/30/2024 21:21	428259	428246	UV2	7.80206	7.71	
12/30/2024 21:22	428260	428246	UV2	7.56342	7.71	
12/30/2024 21:24	428261	428246	UV2	0.97213	0	
12/30/2024 21:26	428262	428246	UV2	0.34656	0	-0.686605
12/30/2024 21:27	428263	428246	UV2	8.37069	7.71	
12/30/2024 21:28	428264	428246	UV2	8.36472	7.71	
12/30/2024 21:41	428265	428246	UV2	0.41689	0	
12/30/2024 21:42	428266	428246	UV2	0.04895	0	0.424785
12/30/2024 21:49	428267	428246	UV2	7.65332	7.71	

12/30/2024 21:54	428268	428246	UV2	7.71019	7.71	
12/30/2024 22:02	428269	428246	UV2	0.36345	0	
12/30/2024 22:08	428270	424036	UV2	0.38406	0	-0.402
12/30/2024 23:39	488724	489701	UV4	12.40724	12.04	
12/30/2024 23:41	488725	489701	UV4	12.6841	12.04	
12/30/2024 23:43	488726	489701	UV4	-1.00225	0	
12/30/2024 23:44	488727	489701	UV4	-0.76401	0	1.3888
12/30/2024 23:46	488728	489701	UV4	12.34069	12.04	
12/30/2024 23:47	488729	489701	UV4	11.57611	12.04	
12/30/2024 23:49	488730	489701	UV4	-0.33492	0	
12/30/2024 23:50	488731	489701	UV4	0.53145	0	-0.179865
12/30/2024 23:52	488732	489701	UV4	12.83372	12.04	
12/30/2024 23:53	488733	489701	UV4	12.00669	12.04	
12/30/2024 23:55	488734	489701	UV4	0.44353	0	
12/30/2024 23:57	488735	489701	UV4	0.14019	0	0.088345
12/30/2024 23:59	488736	489701	UV4	11.21825	12.04	
12/31/2024 0:00	488737	489701	UV4	11.51632	12.04	
12/31/2024 0:03	488738	489701	UV4	-0.04337	0	
12/31/2024 0:04	488739	489701	UV4	-0.50144	0	-0.40031
12/31/2024 0:26	488740	489701	UV4	12.65548	12.04	
12/31/2024 0:27	488741	489701	UV4	11.67477	12.04	
12/31/2024 0:51	488742	489701	UV4	0.92799	0	
12/31/2024 0:52	488743	489701	UV4	0.03612	0	-0.35693
12/27/2024 19:01	488744	488723	UV4	10.34728	12.04	
12/27/2024 19:03	488745	488723	UV4	10.57863	12.04	
12/27/2024 19:06	488746	488723	UV4	0.22606	0	
12/27/2024 19:07	488747	488723	UV4	-0.30301	0	-1.53857
12/17/2024 21:32	660498	660497	UV5	13.25674	14.47	

12/27/2024 19:03	488745	488723	UV4	10.57863	12.04	
12/27/2024 19:06	488746	488723	UV4	0.22606	0	
12/27/2024 19:07	488747	488723	UV4	-0.30301	0	-1.53857
12/17/2024 21:32	660498	660497	UV5	13.25674	14.47	
12/17/2024 21:33	660499	660497	UV5	12.619	14.47	
12/17/2024 21:35	660500	660497	UV5	0.12064	0	
12/17/2024 21:36	660501	660497	UV5	0.35637	0	-1.770635
12/17/2024 21:38	660502	660497	UV5	13.61181	14.47	
12/17/2024 21:39	660503	660497	UV5	13.92802	14.47	
12/17/2024 21:40	660504	660497	UV5	0.27316	0	
12/17/2024 21:41	660505	660497	UV5	0.29152	0	-0.982425
12/17/2024 21:43	660506	660497	UV5	15.74928	14.47	
12/17/2024 21:44	660507	660497	UV5	13.5895	14.47	
12/17/2024 21:45	660508	660497	UV5	0.94967	0	
12/17/2024 21:46	660509	660497	UV5	0.53151	0	-0.5412
12/17/2024 21:48	660510	660497	UV5	14.31777	14.47	
12/17/2024 21:49	660511	660497	UV5	14.48999	14.47	
12/17/2024 21:50	660512	660497	UV5	0.26154	0	
12/17/2024 21:51	660513	660497	UV5	0.74834	0	-0.57106
12/17/2024 21:53	660514	660497	UV5	14.04733	14.47	
12/17/2024 21:54	660515	660497	UV5	13.43797	14.47	
12/17/2024 21:55	660516	660497	UV5	0.5538	0	
12/17/2024 21:56	660517	660497	UV5	1.13751	0	-1.573005
12/17/2024 21:58	660518	660497	UV5	14.48616	14.47	
12/17/2024 21:59	660519	660497	UV5	16.14431	14.47	
12/17/2024 22:00	660520	660497	UV5	1.51912	0	
12/17/2024 22:01	660521	660497	UV5	2.5418	0	-1.185225

Precision results

	UV1	UV2	UV4	UV5
Stdev	0.61	0.54	0.56	0.78
RSD (%)	4.36	8.02	5.68	6.26
No. of Samples	25	25	25	25

Date	File number	Background File no.	System	Concentration (ppb)
12/16/2024 14:28	386325	Argosqa-12/16/2024	UV1	13.61526
12/16/2024 14:28	386326	Argosqa-12/16/2024	UV1	13.34513
12/16/2024 14:29	386327	Argosqa-12/16/2024	UV1	13.81338
12/16/2024 14:29	386328	Argosqa-12/16/2024	UV1	12.98309
12/16/2024 14:30	386329	Argosqa-12/16/2024	UV1	14.25182
12/16/2024 14:30	386330	Argosqa-12/16/2024	UV1	13.36535
12/16/2024 14:31	386331	Argosqa-12/16/2024	UV1	13.90487
12/16/2024 14:31	386332	Argosqa-12/16/2024	UV1	13.85716
12/16/2024 14:32	386333	Argosqa-12/16/2024	UV1	13.17703
12/16/2024 14:32	386334	Argosqa-12/16/2024	UV1	13.63939
12/16/2024 14:33	386335	Argosqa-12/16/2024	UV1	13.05438
12/16/2024 14:34	386336	Argosqa-12/16/2024	UV1	13.14139
12/16/2024 14:36	386337	Argosqa-12/16/2024	UV1	13.21926
12/16/2024 14:36	386338	Argosqa-12/16/2024	UV1	14.13503
12/16/2024 14:37	386339	Argosqa-12/16/2024	UV1	13.9907
12/16/2024 14:37	386340	Argosqa-12/16/2024	UV1	13.49911
12/16/2024 14:38	386341	Argosqa-12/16/2024	UV1	14.69201
12/16/2024 14:38	386342	Argosqa-12/16/2024	UV1	14.52726
12/16/2024 14:39	386343	Argosqa-12/16/2024	UV1	14.34849
12/16/2024 14:39	386344	Argosqa-12/16/2024	UV1	14.44516
12/16/2024 14:40	386345	Argosqa-12/16/2024	UV1	14.16401
12/16/2024 14:41	386346	Argosqa-12/16/2024	UV1	15.22132
12/16/2024 14:41	386347	Argosqa-12/16/2024	UV1	14.50782
12/16/2024 14:42	386348	Argosqa-12/16/2024	UV1	13.67552
12/16/2024 14:42	386349	Argosqa-12/16/2024	UV1	14.81622

12/17/2024 13:32	424389	424388	UV2	6.6645
12/17/2024 13:33	424390	424388	UV2	6.89403
12/17/2024 13:34	424391	424388	UV2	7.14833
12/17/2024 13:34	424392	424388	UV2	6.82901
12/17/2024 13:35	424393	424388	UV2	5.69807
12/17/2024 13:35	424394	424388	UV2	8.10085
12/17/2024 13:36	424395	424388	UV2	6.92374
12/17/2024 13:36	424396	424388	UV2	7.70888
12/17/2024 13:37	424397	424388	UV2	6.06734
12/17/2024 13:37	424398	424388	UV2	6.42696
12/17/2024 13:38	424399	424388	UV2	6.57203
12/17/2024 13:38	424400	424388	UV2	6.22511
12/17/2024 13:39	424401	424388	UV2	6.70976
12/17/2024 13:40	424402	424388	UV2	6.39482
12/17/2024 13:40	424403	424388	UV2	7.2667
12/17/2024 13:41	424404	424388	UV2	6.82919
12/17/2024 13:41	424405	424388	UV2	6.97879
12/17/2024 13:42	424406	424388	UV2	6.30423
12/17/2024 13:42	424407	424388	UV2	6.72749
12/17/2024 13:43	424408	424388	UV2	7.66478
12/17/2024 13:43	424409	424388	UV2	6.9604
12/17/2024 13:44	424410	424388	UV2	6.38088
12/17/2024 13:44	424411	424388	UV2	6.77862
12/17/2024 13:45	424412	424388	UV2	6.79397
12/17/2024 13:45	424413	424388	UV2	6.07986

12/27/2024 18:13	488698	488696	UV4	9.99757
12/27/2024 18:14	488699	488696	UV4	10.35479
12/27/2024 18:15	488700	488696	UV4	10.01655
12/27/2024 18:15	488701	488696	UV4	10.78621
12/27/2024 18:16	488702	488696	UV4	10.74573
12/27/2024 18:16	488703	488696	UV4	9.67898
12/27/2024 18:17	488704	488696	UV4	9.23269
12/27/2024 18:17	488705	488696	UV4	10.00171
12/27/2024 18:18	488706	488696	UV4	9.25409
12/27/2024 18:18	488707	488696	UV4	8.77525
12/27/2024 18:19	488708	488696	UV4	10.11109
12/27/2024 18:19	488709	488696	UV4	9.59188
12/27/2024 18:20	488710	488696	UV4	10.29331
12/27/2024 18:20	488711	488696	UV4	10.22502
12/27/2024 18:21	488712	488696	UV4	10.18191
12/27/2024 18:21	488713	488696	UV4	9.94488
12/27/2024 18:22	488714	488696	UV4	9.93785
12/27/2024 18:23	488715	488696	UV4	10.10332
12/27/2024 18:23	488716	488696	UV4	9.41974
12/27/2024 18:24	488717	488696	UV4	9.69772
12/27/2024 18:24	488718	488696	UV4	9.85705
12/27/2024 18:26	488719	488696	UV4	8.87232
12/27/2024 18:26	488720	488696	UV4	8.80305
12/27/2024 18:27	488721	488696	UV4	10.59963
12/27/2024 18:28	488722	488696	UV4	9.57096

Date	File number	Background File no.	System	Concentration (ppb)
12/17/2024 20:59	660467	660466	UV5	12.807
12/17/2024 21:00	660468	660466	UV5	12.25065
12/17/2024 21:00	660469	660466	UV5	11.05096
12/17/2024 21:01	660470	660466	UV5	11.19343
12/17/2024 21:01	660471	660466	UV5	12.27764
12/17/2024 21:02	660472	660466	UV5	12.61055
12/17/2024 21:03	660473	660466	UV5	11.8229
12/17/2024 21:03	660474	660466	UV5	11.15555
12/17/2024 21:04	660475	660466	UV5	12.37807
12/17/2024 21:04	660476	660466	UV5	12.77088
12/17/2024 21:05	660477	660466	UV5	11.90439
12/17/2024 21:05	660478	660466	UV5	12.73732
12/17/2024 21:06	660479	660466	UV5	12.4702
12/17/2024 21:06	660480	660466	UV5	12.06637
12/17/2024 21:07	660481	660466	UV5	12.45265
12/17/2024 21:07	660482	660466	UV5	12.26527
12/17/2024 21:08	660483	660466	UV5	12.70138
12/17/2024 21:08	660484	660466	UV5	13.23184
12/17/2024 21:09	660485	660466	UV5	14.61371
12/17/2024 21:09	660486	660466	UV5	12.72108
12/17/2024 21:10	660487	660466	UV5	12.37737
12/17/2024 21:10	660488	660466	UV5	13.80504
12/17/2024 21:11	660489	660466	UV5	12.17607
12/17/2024 21:11	660490	660466	UV5	13.33033
12/17/2024 21:12	660491	660466	UV5	12.3969

MDL results

Q1

Location	January MDL (ppb)	February MDL (ppb)	March MDL (ppb)
UV_1	0.36	0.23	0.23
UV_2	0.32	0.52	0.28
UV_4	0.36	0.26	0.27
UV_5	0.40	0.30	0.34

Q2

Location	April MDL (ppb)	May MDL (ppb)	June MDL (ppb)
UV_1	0.25	0.33	0.21
UV_2	0.56	0.29	0.28
UV_4	0.29	0.27	0.25
UV_5	0.87	0.34	0.34

Q3

Location	July MDL (ppb)	August MDL (ppb)	September MDL (ppb)
UV_1	0.20	0.40	0.53
UV_2	0.42	0.68	0.75
UV_4	0.23	0.57	0.41
UV_5	0.51	0.56	0.45

Q4

Location	October MDL (ppb)	November MDL (ppb)	December MDL (ppb)
UV_1	0.69	0.52	0.26
UV_2	0.73	0.72	0.23
UV_4	0.78	0.97	0.31
UV_5	0.50	0.50	0.34

Accuracy results

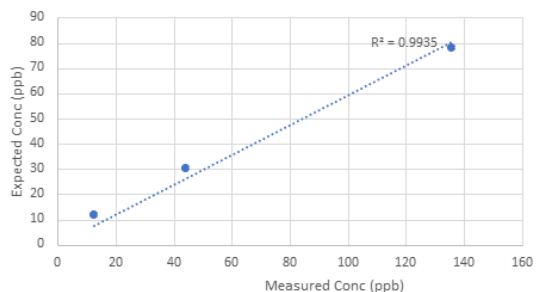
	UV1	UV2	UV4	UV5
Average Conc of Ref Gas (ppb)	11.53	7.71	12.04	14.47
Average Conc of Measurements (ppb)	11.6	6.684975	11.33883	13.19
Accuracy (%)	0.63	13.29475	5.823713	8.86
RSD (%)	2.97238	4.367617	9.871437	8.504744

Date	File number	Background File no.	System	Concentration (ppb)	Expected Conc (ppb)	Collection time (min)
9/27/2024 23:19	363709	Argosqa-9/27/2024 10:59:24 PM-363701	UV1	11.98399	11.53	0.5
8/23/2024 20:49	353811	Argosqa-8/23/2024 8:22:43 PM-353796	UV1	11.3132	11.53	0.5
7/8/2024 19:58	349314	Argosqa-8/7/2024 7:49:01 PM-349309	UV1	11.51009	11.53	0.5
12/30/2024 19:39	428221	428220/428222	UV2	7.02416	7.71	1
12/30/2024 19:44	428224	428223/428225	UV2	6.50661	7.71	1
12/30/2024 19:51	428227	428226/428228	UV2	6.909835	7.71	1
12/30/2024 19:57	428230	428229/428231	UV2	6.434225	7.71	1
12/30/2024 20:15	428233	428332/428334	UV2	6.55	7.71	5
12/31/2024 0:54	489743	489742/489744	UV4	11.8874	12.04	1
12/31/2024 1:09	489755	489745/489756	UV4	11.102635	12.04	1
12/31/2024 1:15	489758	489757/489758	UV4	12.48607	12.04	1
12/31/2024 1:34	489761	489760/489762	UV4	11.67513	12.04	1
12/27/2024 21:09	488806	488805/488807	UV4	9.54289	12.04	5
12/20/2024 19:21	661337	661336/661338	UV5	14.0512	14.47	1
12/20/2024 19:25	661340	661339/661341	UV5	12.83479	14.47	1
12/20/2024 19:29	661343	661342/661344	UV5	14.1592	14.47	1
12/20/2024 19:33	661346	661345/661347	UV5	11.41652	14.47	1
12/20/2024 19:46	661349	661348/661350	UV5	13.47485	14.47	5

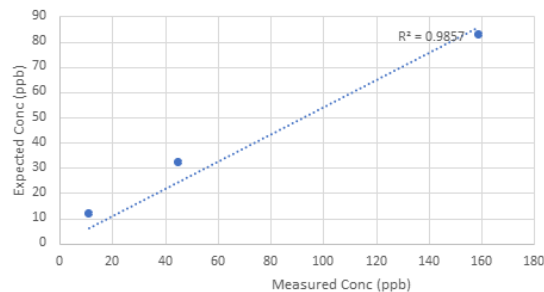
Linearity results

Date	File number	Background File no.	System	Concentration (ppb)	Expected Conc (ppb)
24/12/2024	388598	388595	UV1	12.73	12.23
24/12/2024	388599	388595	UV1	44.26	30.79
24/12/2024	388603	388595	UV1	135.74	78.43
24/12/2024	426405	426401	UV2	6.85	7.71
24/12/2024	426408	426401	UV2	65.91	62.38
24/12/2024	426411	426401	UV2	205.5	158.88
24/12/2024	487759	487751	UV4	10.99	12.04
24/12/2024	487752	487751	UV4	44.76	32.48
24/12/2024	487755	487751	UV4	158.72	82.72
24/12/2024	662387	662386	UV5	13.7	14.47
24/12/2024	662390	662386	UV5	136.63	85.85
24/12/2024	662393	662386	UV5	462.18	218

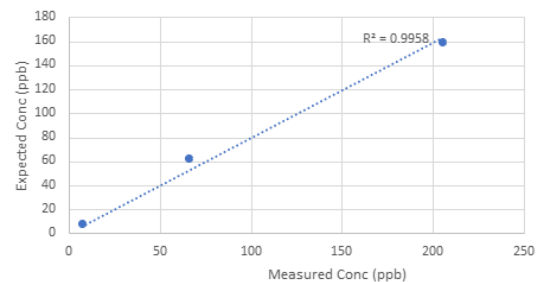
Benzene Linearity Check UV1



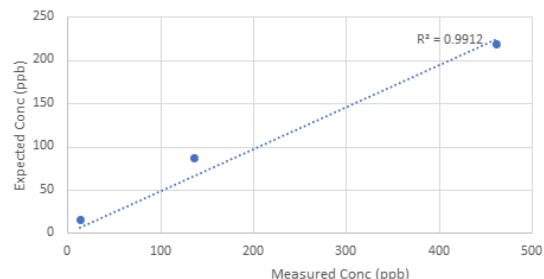
Benzene Linearity Check UV4



Benzene Linearity Check UV2



Benzene Linearity Check UV5



Robustness Temperature

	UV1	UV2	UV4	UV5
Average A	11.42926	11.055	11.19012	14.70451
STDDEV	0.383853	0.176777	0.382191	0.40856
RSD (%)	3.358514	1.599066	3.415434	2.778467
Min Temp	16	9	11.63	12.2
Max Temp	29	45	29.6	29.8

Date	System	Concentration	Temperature Deg C
1/25/2024 16:28	UV1	11.95906	16
4/18/2024 8:36	UV1	11.04606	25
6/26/2024 19:33	UV1	11.31264	27
8/23/2024 20:41	UV1	11.39927	29
1/30/2024 9:38	UV2	10.93	10.6
5/24/2024 9:55	UV2	11.18	24.775
9/12/2024 8:49	UV4	11.53989	29.6
9/13/2024 21:24	UV4	11.19324	27.2
11/27/2024 18:45	UV4	10.6155	13.7
12/17/2024 22:02	UV4	11.53246	11.63
12/27/2024 18:55	UV4	11.06951	13.14
9/9/2024 15:59	UV5	14.23952	29.8
9/30/2024 16:44	UV5	14.20817	27.8
10/8/2024 21:09	UV5	14.90528	26.1
10/30/2024 15:57	UV5	14.83066	23.9
11/19/2024 20:44	UV5	15.47759	16.9
12/6/2024 9:46	UV5	14.78186	18.33
12/17/2024 21:49	UV5	14.48999	12.2
12/20/2024 21:14	UV5	14.70299	15.42

Robustness Sample Time

	UV1	UV2	UV4	UV5
Average Conc of Ref Gas (ppb)	12.23	7.71	12.04	14.47
Average Conc of Measurements (ppb)	13.57	7.24	10.39993	14.86
Accuracy (%)	10.99	6.05	13.62188	2.71

Date	File numb	Backgrou	System	Concentration (ppb)	Expected Co	Collection time (min)
12/16/2024 14:29	386327	Argosqa-1	UV1	13.81338	12.23	0.5
12/16/2024 14:29	386328	Argosqa-1	UV1	12.98309	12.23	0.5
12/16/2024 14:59	386350	Argosqa-1	UV1	13.32498	12.23	1
12/16/2024 15:00	386351	Argosqa-1	UV1	13.76401	12.23	1
12/16/2024 15:15	386356	Argosqa-1	UV1	13.8187	12.23	5
12/16/2024 14:34	386336	Argosqa-1	UV1	13.14139	12.23	0.5
12/16/2024 14:36	386337	Argosqa-1	UV1	13.21926	12.23	0.5
12/16/2024 15:01	386352	Argosqa-1	UV1	14.09317	12.23	1
12/16/2024 15:02	386353	Argosqa-1	UV1	13.74856	12.23	1
12/16/2024 15:09	386355	Argosqa-1	UV1	13.83495	12.23	5
12/30/2024 20:34	428236	428235	UV2	6.74199	7.71	0.5
12/30/2024 20:35	428237	428235	UV2	8.22372	7.71	0.5
12/30/2024 20:35	428238	428235	UV2	6.71286	7.71	0.5
12/30/2024 20:37	428239	428235	UV2	7.24774	7.71	1
12/30/2024 20:38	428240	428235	UV2	7.96533	7.71	1
12/30/2024 20:39	428241	428235	UV2	7.65861	7.71	1
12/30/2024 20:41	428242	428235	UV2	6.69081	7.71	1
12/30/2024 20:47	428243	428235	UV2	6.98358	7.71	5
12/30/2024 20:52	428244	428235	UV2	7.15496	7.71	5
12/30/2024 20:58	428245	428235	UV2	7.05814	7.71	5
12/27/2024 19:37	488771	488770	UV4	10.5242	12.04	0.5
12/27/2024 19:38	488772	488770	UV4	9.9254	12.04	0.5
12/27/2024 19:38	488773	488770	UV4	10.36939	12.04	0.5
12/27/2024 19:40	488774	488770	UV4	10.15768	12.04	1
12/27/2024 19:41	488775	488770	UV4	11.16888	12.04	1
12/27/2024 19:42	488776	488770	UV4	10.80102	12.04	1
12/27/2024 19:49	488777	488770	UV4	10.08344	12.04	5
12/27/2024 19:54	488778	488770	UV4	10.1694	12.04	5
12/20/2024 21:00	661375	661374	UV5	14.99011	14.47	0.5
12/20/2024 21:00	661376	661374	UV5	17.49574	14.47	0.5
12/20/2024 21:01	661377	661374	UV5	15.23997	14.47	1
12/20/2024 21:02	661378	661374	UV5	12.73197	14.47	1
12/20/2024 21:03	661379	661374	UV5	14.42173	14.47	1
12/20/2024 21:09	661380	661374	UV5	14.45502	14.47	5
12/20/2024 21:14	661381	661374	UV5	14.70299	14.47	5

Oil Refineries Ltd.

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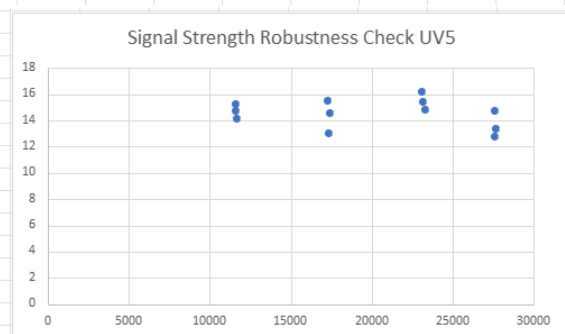
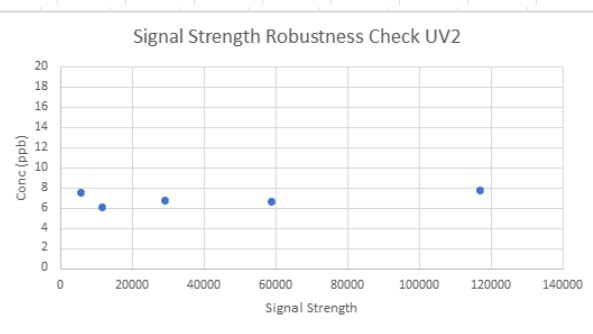
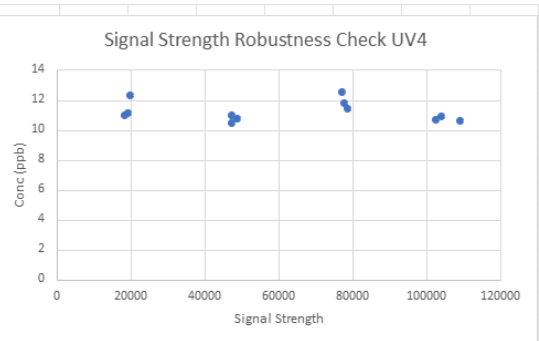
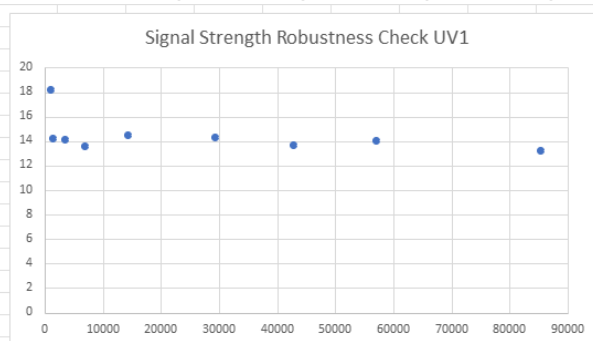
Gadiv Petrochemical Industries Ltd.

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Robustness Signal Strength

	UV1	UV2	UV4	UV5
Average (ppb)	13.99	6.95	11.19183	14.6
Stddev	0.44	0.67	0.67455	1.04
RSD (%)	3.17	9.69	6.02717	7.14
Min Signal	2404	2404	18291.45	11630.13
Max Signal	150287	150287	109069.4	27590.06
Number of Sam	9	5	12	12





Sample Date	Site Name	File Number	Path Leng	Signal Strength	Benzene
12/16/2024 15:49	UV1	386366	867	85246.82	13.22965
12/16/2024 15:50	UV1	386367	867	57015.28	14.07912
12/16/2024 15:50	UV1	386368	867	42868.14	13.70436
12/16/2024 15:52	UV1	386369	867	29346.05333	14.36559
12/16/2024 15:53	UV1	386370	867	14263.46667	14.51342
12/16/2024 15:54	UV1	386371	867	7015.395	13.58599
12/16/2024 15:55	UV1	386372	867	3521.7925	14.19721
12/16/2024 15:55	UV1	386373	867	1430.548	14.28446
12/16/2024 15:57	UV1	386374	867	1140	18.2082
12/17/2024 11:34:52 AM	UV2	424352	428	116964.0667	7.71804
12/17/2024 11:35:40 AM	UV2	424353	428	58803.7	6.65365
12/17/2024 11:36:25 AM	UV2	424354	428	29238.64167	6.75969
12/17/2024 11:37:08 AM	UV2	424355	428	11729.71	6.07918
12/17/2024 11:38:55 AM	UV2	424356	428	5929.023333	7.53468

12/27/2024 19:18	UV4	488756	822	102424.8649	10.64898
12/27/2024 19:20	UV4	488757	822	103989.1351	10.8663
12/27/2024 19:20	UV4	488758	822	109069.3514	10.57214
12/27/2024 19:26	UV4	488759	822	78525.42593	11.42248
12/27/2024 19:26	UV4	488760	822	77652.40741	11.77697
12/27/2024 19:27	UV4	488761	822	77053.61111	12.52937
12/27/2024 19:28	UV4	488762	822	47271.8	10.44081
12/27/2024 19:29	UV4	488763	822	47181.58824	10.94478
12/27/2024 19:30	UV4	488764	822	48669.45882	10.74061
12/27/2024 19:30	UV4	488765	822	19065.565	11.10388
12/27/2024 19:31	UV4	488766	822	18291.445	10.98771
12/27/2024 19:33	UV4	488767	822	19918.2	12.26787
12/20/2024 21:15	UV5	661382	311	27590.06	14.8086
12/20/2024 21:16	UV5	661383	311	27569.74	12.78831
12/20/2024 21:16	UV5	661384	311	27677.42	13.43076
12/20/2024 21:17	UV5	661385	311	23324.46	14.89613
12/20/2024 21:18	UV5	661386	311	23163.03	15.47345
12/20/2024 21:18	UV5	661387	311	23118.22	16.20304
12/20/2024 21:19	UV5	661388	311	17302.52	15.56511
12/20/2024 21:20	UV5	661389	311	17384.44	13.09234
12/20/2024 21:20	UV5	661390	311	17426.44	14.6508
12/20/2024 21:21	UV5	661391	311	11630.13	15.26148
12/20/2024 21:22	UV5	661392	311	11633.07	14.78693
12/20/2024 21:22	UV5	661393	311	11640.49	14.19296

Validated 24 hours average Fenceline results

Attached files:

1. Bazan_Site_#1_24H_validated_20240101_to_20250101.csv
2. Bazan_Site_#2_24H_validated_20240101_to_20250101.csv
3. Bazan_Site_#4_24H_validated_20240101_to_20250101.csv
4. Bazan_Site_#5_24H_validated_20240101_to_20250101.csv

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