REPORT

Ambient Air Quality Monitoring (VOCs) Report - June 2021

Akzo Nobel Pty Ltd

Submitted to:

Akzo Nobel Pty Ltd
51 McIntyre Rd
Sunshine North
3020 VIC

Submitted by:

Golder Associates Pty Ltd
Building 7, Botanicca Corporate Park, 570 – 588 Swan Street, Richmond, Victoria 3121, Australia

+61 3 8862 3500

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1x Golder Associates Pty Ltd

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1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was commissioned by AkzoNobel Pty Ltd (AkzoNobel) to conduct an ambient air quality monitoring programme at the AkzoNobel site located at 51 McIntyre Road, Sunshine North (the site). The aim of the monitoring program was to assess Volatile Organic Compounds (VOCs) at the site boundary in accordance with the scope outlined in Golder Proposal No. 19130795-014-TM-Rev0, issued on 14 April 2021.

The assessment has been conducted in response to an Amended Clean Up Notice issued to AkzoNobel by the Environment Protection Authority (EPA VIC) issued on 24/12/2020 (CUN No. 90011933).

The following report describes the scope of works, test methods used, and the VOC monitoring results for June 2021.

2.0 SCOPE OF WORKS

2.1 Monitoring Schedule

The VOCs monitoring programme was conducted during July 2021 around the boundary of the AkzoNobel site in Sunshine North. The VOC monitoring consisted of samples being deployed on a 1-in-6-day sampling schedule for a period of 24 hours. The installation and collection dates for the samplers are presented in Table 1.

Table 1: Installation and Collection dates

Round No.	Installation Date	Collection Date
9	Wednesday 2nd June 2021	Thursday 3rd June 2021
10	Tuesday 8th June 2021	Wednesday 9th June 2021
11	Monday 14th June 2021	Tuesday 15th June 2021
12	Sunday 20th June 2021	Monday 21st June 2021
13	Saturday 26th June 2021	Sunday 27th June 2021

2.2 Sampling Locations

Eight sampling locations were selected around the site boundary to represent and characterise the off-site emissions. (Figure 1).

Figure 1: AkzoNobel fence line (green) and air quality (VOCs) sampling locations (labelled pins)

3.0 TEST METHODS

Benzene, Toluene, Ethyl benzene, Xylene isomers (BTEX) monitoring was carried out in accordance with Golder Associates Test Method No. P13, *"Passive Gas Sampling: In Ambient Air by Radiello Passive Samplers".*

Diffusive samplers consist of a diffusive barrier through which gases of interest are allowed to pass, to a separate sorbent section. Gases of interest diffuse across the barrier driven by a concentration gradient and are collected in the sorbent material. The sorbent section is then desorbed in a suitable solvent and analysed by gas chromatography with flame ionisation detection (GC-FID).

Table 2: BTEX Reporting Limits

Compound	Limit of Detection* ($\mu g/m^3$)
Benzene	20
Toluene	10
Ethylbenzene	10
m,p-Xylene	10
o-Xylene	10

* Based on a 24 hour sampling period

4.0 UNCERTAINTY

Experiments conducted in a standard atmosphere chamber suggest that the calculated sampling rates for Radiello adsorbing cartridges seldom deviate by more than ± 10% from the experimentally measured values.

The estimated measurement uncertainty for analysis of BTEX on Radiello absorbing cartridges is ± 10%. The specific measurement uncertainty for each compound is detailed in Table 3.

Table 3: Analytical Uncertainty

VOC Compound	Measurement Uncertainty
Ethylbenzene	2.5%
Toluene	1.5%
Xylene (m-, o- and p-)	2.5% (each)

5.0 AMBIENT AIR QUALITY CRITERIA

The National Environment Protection (Air Toxics) Measure (NEPC 1994) includes 24-hr criteria for toluene and total xylenes. There are no available NEPM (Air Toxics) criteria for ethylbenzene.

For the purposes of this assessment toluene and total xylene observations will be compared directly to their corresponding NEPM (Air Toxics) criteria (Table 4).

Table 4: Ambient Air Quality Criteria for the AkzoNobel Air Quality Monitoring Program

VOC Compound	NEPM (Air Toxics)	
	Averaging Period	Criteria ($\mu g/m^3$)
Toluene	24-hr	3766
Xylenes	24-hr	1085

Notes: $\mu g/m^3$ = micrograms per cubic metre of air at 25 °C and 101.3 kPa

6.0 RESULTS

6.1 VOCs

The results of the VOC monitoring for toluene, ethylbenzene and total xylene isomers for each round of the monitoring programme are presented in Table 5 to Table 9.

Table 5: Round 9 – 03-06-2021

Sample No	Location	Sample period		Concentration (µg/m^3)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-1033	West	02-06-2021 09:57	03-06-2021 10:51	<4	<5	<20
21-1034	South West	02-06-2021 10:04	03-06-2021 10:58	<4	<5	<20
21-1035	South	02-06-2021 10:10	03-06-2021 11:03	<4	<5	**55**
21-1036	South East	02-06-2021 10:20	03-06-2021 11:10	<4	<5	<20
21-1037	East	02-06-2021 10:25	03-06-2021 11:15	<4	<5	<20
21-1038	North East	02-06-2021 10:31	03-06-2021 11:19	<4	<5	<20
21-1039	North	02-06-2021 10:39	03-06-2021 11:27	<4	<5	<20
21-1040	North West	02-06-2021 10:47	03-06-2021 11:34	<4	<5	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-07-2021, conducted by Golder Associates.

Table 6: Round 10 – 09-06-2021

Sample No	Location	Sample period		Concentration (µg/m^3)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-1042	West	08-06-2021 9:25	09-06-2021 9:52	<5	<5	<20
21-1043	South West	08-06-2021 9:33	09-06-2021 10:00	<5	<5	<20
21-1044	South	08-06-2021 9:40	09-06-2021 10:05	<5	**22**	**100**
21-1045	South East	08-06-2021 9:51	09-06-2021 10:13	<5	<5	**36**
21-1046	East	08-06-2021 9:58	09-06-2021 10:19	<5	<5	**81**
21-1047	North East	08-06-2021 10:12	09-06-2021 10:25	<5	<5	**12**
21-1048	North	08-06-2021 10:24	09-06-2021 10:31	<5	<5	<20
21-1049	North West	08-06-2021 10:33	09-06-2021 10:38	<5	<5	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-07-2021, conducted by Golder Associates.

Table 7: Round 11 – 15-06-2021

Sample No	Location	Sample period		Concentration (µg/m³)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-1050	West	14-06-2021 11:01	15-06-2021 11:50	<5	<5	<20
21-1051	South West	14-06-2021 11:09	15-06-2021 11:56	<5	<5	<20
21-1052	South	14-06-2021 11:15	15-06-2021 12:00	<5	<5	**15**
21-1053	South East	14-06-2021 11:29	15-06-2021 12:06	<5	<5	<20
21-1054	East	14-06-2021 11:36	15-06-2021 12:13	<5	<5	<20
21-1055	North East	14-06-2021 11:42	15-06-2021 12:18	<5	<5	<20
21-1056	North	14-06-2021 11:54	15-06-2021 12:27	<5	<5	<20
21-1057	North West	14-06-2021 12:01	15-06-2021 12:33	**7.7**	<5	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-07-2021, conducted by Golder Associates.

Table 8: Round 12 – 21-06-2021

Sample No	Location	Sample period		Concentration (µg/m³)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-1090	West	20-06-2021 9:03	21-06-2021 10:00	<5	<5	<20
21-1091	South West	20-06-2021 9:10	21-06-2021 10:05	<5	<5	<20
21-1092	South	20-06-2021 9:16	21-06-2021 10:09	<5	<5	<20
21-1093	South East	20-06-2021 9:24	21-06-2021 10:14	**8.8**	<5	<20
21-1094	East	20-06-2021 9:31	21-06-2021 10:20	<5	<5	<20
21-1095	North East	20-06-2021 9:36	21-06-2021 10:25	<5	<5	<20
21-1096	North	20-06-2021 9:46	21-06-2021 10:33	**74**	<5	<20
21-1097	North West	20-06-2021 9:52	21-06-2021 10:38	<5	<5	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-07-2021, conducted by Golder Associates.

Table 9: Round 13 – 27-06-2021

Sample No	Location	Sample period		Concentration (µg/m³)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-1161	West	26-06-2021 16:32	27-06-2021 17:07	<5	<5	<20
21-1162	South West	26-06-2021 16:39	27-06-2021 17:11	<5	<5	<20
21-1163	South	26-06-2021 16:45	27-06-2021 17:16	<5	<5	<20
21-1164	South East	26-06-2021 16:52	27-06-2021 17:23	<5	<5	<20
21-1165	East	26-06-2021 16:59	27-06-2021 17:29	<5	<5	<20
21-1166	North East	26-06-2021 17:06	27-06-2021 17:37	<5	<5	<20
21-1167	North	26-06-2021 17:17	27-06-2021 17:43	<5	<5	<20
21-1168	North West	26-06-2021 17:23	27-06-2021 17:47	<5	<5	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-76-2021, conducted by Golder Associates.

The average meteorological conditions are summarised in **Error! Reference source not found.**. Wind rose plots for each sampling round are available Figure 2 to Figure 6

Table 10: Summary of Wind Conditions

Round No	Start Date	End Date	Predominant Wind Direction (°)	Average Wind Speed (m/s)
9	02-06-2021	03-06-2021	NNE	0.99
10	08-06-2021	09-06-2021	W	2.3
11	14-06-2021	15-06-2021	NNE	0.85
12	20-06-2021	21-06-2021	N and S-SSE	0.54
13	26-06-2021	27-06-2021	N	1.7

6.2 Meteorological Conditions

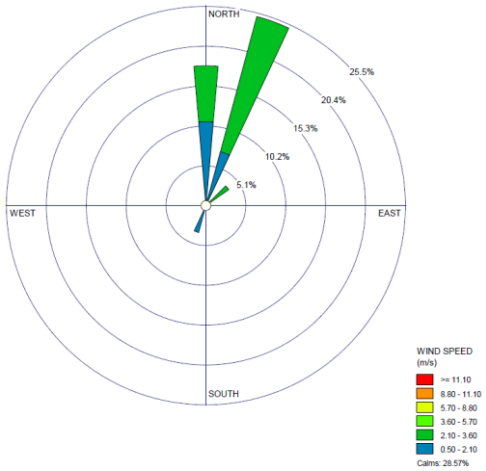

Figure 2: Round 9 – 03-06-2021

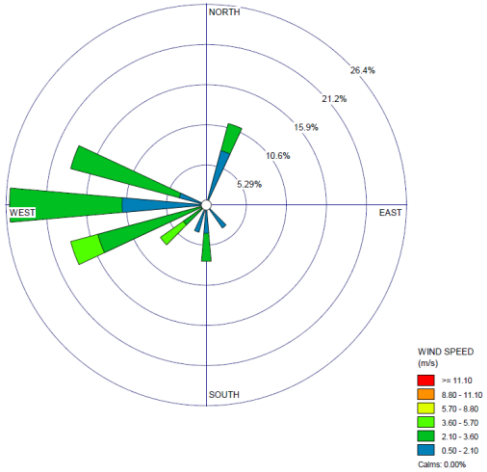

Figure 3: Round 10 – 09-06-2021

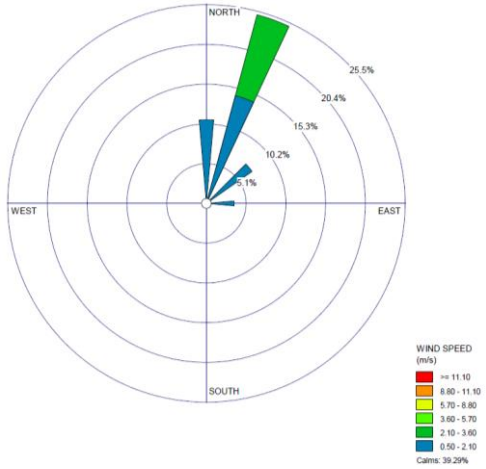

Figure 4: Round 11 – 15-06-2021

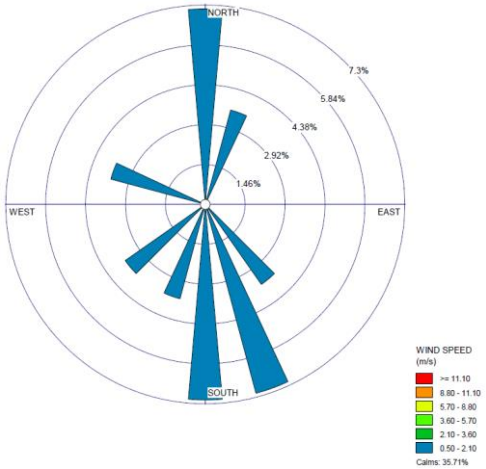

Figure 5: Round 12 – 21-06-2021

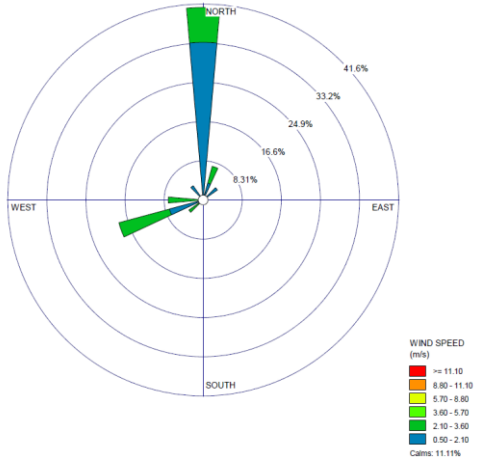

Figure 6: Round 13 – 27-06-2021

7.0 DISCUSSION

A summary of compounds detected above the method limit of detection, compared with the predominant wind direction and ambient air quality criteria is presented in Table 11.

Table 11: Summary

		Concentration (µg/m^3)			Predominant Wind Direction
Location	Sample Date	Toluene	Ethylbenzene	Total Xylenes	
South	03-06-2021	<4	<5	**55**	NNE
South	09-06-2021	<5	**22**	**100**	W
South East	09-06-2021	<5	<5	**36**	W
East	09-06-2021	<5	<5	**81**	W
North East	09-06-2021	<5	<5	**12**	W
South	15-06-2021	<5	<5	**15**	NNE
North West	15-06-2021	**7.7**	<5	<20	NNE
South East	21-06-2021	**8.8**	<5	<20	N and S-SSE
North	21-06-2021	**74**	<5	<20	N and S-SSE
Criteria		**3766**	**NA**	**1085**	

The VOC fence line monitoring conducted at AzkoNobel, Sunshine North during June 2021 reported all results below the ambient air quality monitoring criteria for all reported compounds.

8.0 IMPORTANT INFORMATION

Your attention is drawn to the document titled - “Important Information Relating to this Report”, which is included in Appendix A of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.

Signature Page

Golder Associates Pty Ltd

Florence Damour
Environmental Scientist

Mark Tulau
Air Quality Specialist

FMD/MT/fmd

A.B.N. 64 006 107 857

https://golderassociates.sharepoint.com/sites/115853/project files/6 deliverables/019-r-vocs monitoring - june 2021/19130795-019-r-rev0_vocs monitoring - june 2021.docx

APPENDIX A

Important Information

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