ENVIRONMENTAL AIR QUALITY MONITORING

LAB NO : LA/1216/545

PROJECT REF : ETD/AIR/1191/16

DATE MONITORED : 29th DECEMBER 2016 – 02nd JANUARY 2017

DATE REPORTED : 16th JANUARY 2017

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1.0 INTRODUCTION

Chemvi Laboratory Sdn. Bhd. was engaged by **INTEGRATED ENVIRORICH SDN BHD** to conduct Environmental Air Monitoring on **29th DECEMBER 2016 – 02nd JANUARY 2017** located at the following project site:-

"ENVIRONMENTAL MONITORING AT KLEBANG, MELAKA"

The objective of this monitoring was to determine the ambient air characteristics surrounding the project site in order to fulfill conditions imposed under the EIA approval by the DOE. The monitoring was carried out for duration of 24 hours.

The parameters monitored in this study were:-

- PM 10
- PM 2.5
- Sulphur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)

The details of the monitoring are as follows:-

1.1 Sampling Personnel

Mr. Ehsan / Mr. Adzwan - Field Technician

1.2 Site Description

POINT	GPS LOCATION	DATE & TIME OF SAMPLING
A1	2°12'42.74"N 102°11'16.47"E	**29/12/2016 – 30/12/2016** 07.00 am – 07.00 am
A2	2°13'2.90"N 102°11'19.27"E	**30/12/2016 – 31/12/2016** 07.00 am – 07.00 am
A3	2°13'13.12"N 102°10'50.98"E	**31/12/2016 – 01/01/2017** 07.00 am – 07.00 am
A4	2°13'16.68"N 102°10'29.73"E	**01/01/2017 – 02/01/2017** 07.00 am – 07.00 am

NOTE: During the monitoring, the weather was clear.

2.0 METHODOLOGY

2.1 AMBIENT AIR QUALITY

2.1.1 Relative Humidity and Temperature

Environmental air temperature and relative humidity measurements were performed using the following equipment.

Air Temperature : Hot wire anemometer
TSI Incorporated.
Model 8386- M-GB

Relative Humidity : G.H. Zeal Limited.
ZEAL Digital Thermo Hygro.
Model P2540 (20/95% Relative Humidity and -50/70 Deg. C)

2.1.2 Particulate Matter 10 micron (PM_{10})

- Method: U. S. Environmental Protection Agency (USEPA) at 40 CFR 50, Appendix J.
- Method Name: Determination of Ambient Air Quality Using the Andersen Continuous Beta Attenuation Monitor.
- Sampling Description: Air is drawn into a PM_{10} sampler and through a filter by means of a High Volume Sampler at a flow rate (1.13m^3/min) that allows suspended particles with a diameter of 10 microns or less to pass to the filter paper. The mass concentration of suspended particulates in the ambient air (µg/m^3) is computed by measuring the mass of collected particulate and the volume of air sampled.
- Sampling duration: 24 hours

2.1.3 Particulate Matter 2.5 micron ($PM_{2.5}$)

- Method: U. S. Environmental Protection Agency (USEPA) at 40 CFR 50, Appendix L.
- Method Name: Determination of Ambient Air Quality Using the Andersen Continuous Beta Attenuation Monitor.
- Sampling Description: The environmental air samples enter the $PM_{2.5}$ sampler at the specified flow rate (1.13m^3/min) through an opening under the weather proof hood. The air then flows into a stilling chamber and through a screen that is designed to prevent the entry of insects and larger sized air borne into the fractioning system. The air then flow through a set of 40 impactor jets that direct the air towards a wetted collection surface. Impaction of particles with sizes larger than 2.5 micron takes place

on a porous that is wetted with oil. Particles smaller than 2.5 micron aerodynamic diameter are vented from the impaction zone and flow downward to the sampling filter. The mass concentration of suspended particulates in the ambient air ($\mu g/m^3$) is computed by measuring the mass of collected particulate and the volume of air sampled.

- Sampling duration: 24 hours

2.3 Sulphur Dioxide (SO_2) - Method Ref.: ISC 704A

The environmental air samples are collected from the fixed point where ambient air is drawn from the surrounding area at a known flow rate through the absorbing media via a precalibrated portable pump stationed at the fixed point. The SO_2 collected is then brought back to the laboratory and determined by colorimetry.

2.6 Nitrogen Dioxide (NO2) - Method Ref.: ISC 408

The environmental air samples are collected from the fixed point where ambient air is drawn from the surrounding area at a known flow rate through the absorbing media via a precalibrated portable pump stationed at the fixed point. The NO_2 collected is then brought back to the laboratory and determined by colorimetry.

2.7 Carbon Monoxide (CO)/Hydrocarbon – Method Ref.: Method Ref.: CV01-01*

A known volume of air at a standard flow rate is drawn through a glass tube containing a solid adsorbent impregnated with a reagent that reacts with carbon monoxide to form a coloured stain.

Note:

1) USEPA means United States Environmental Protection Agency.

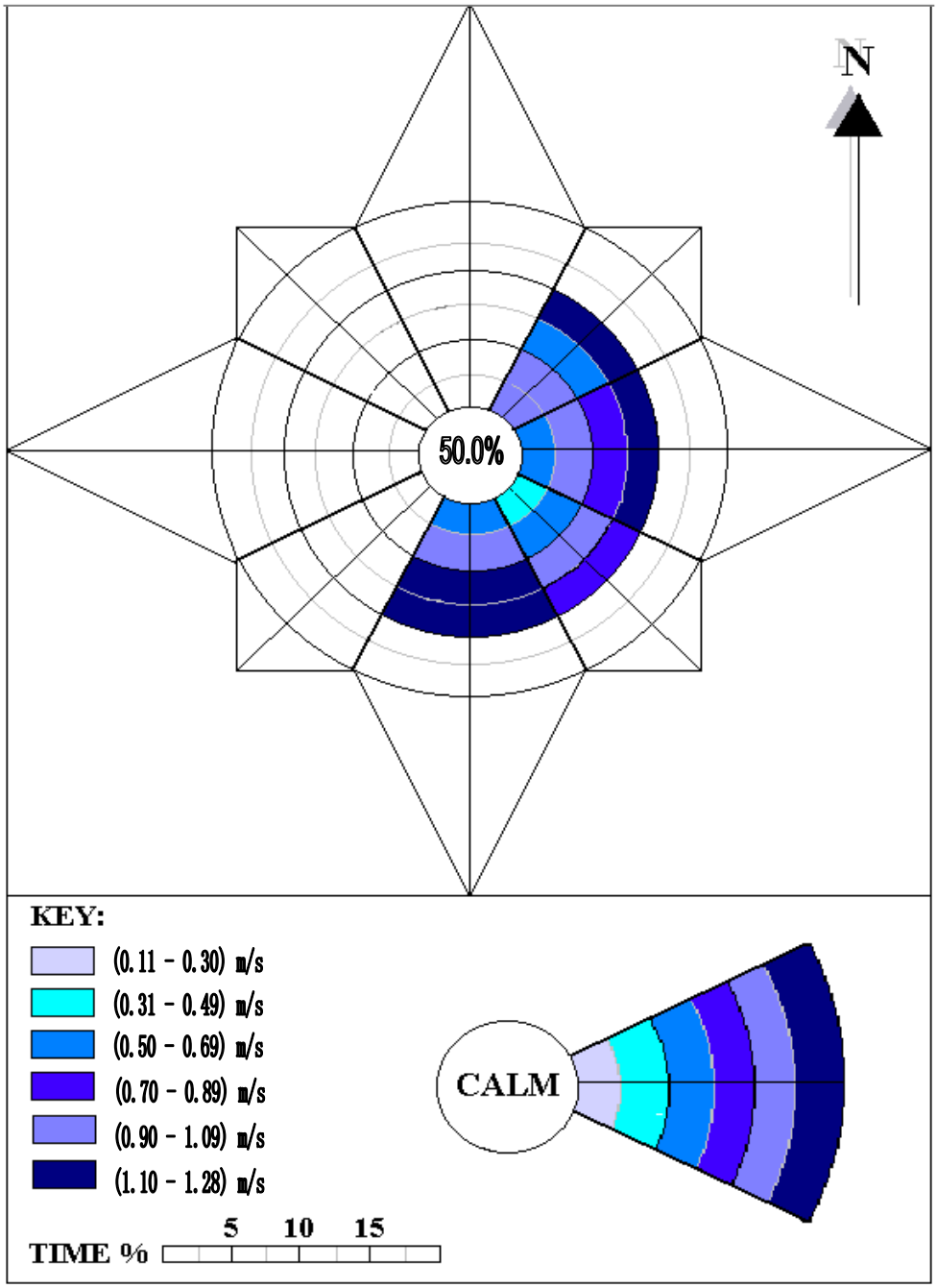
2) ISC means Methods of Air Sampling and Analysis, 3rd Edition, 1990;
Inter Society Committee.

3) NIOSH means National Institute of Occupational Safety & Health

3.0 MONITORING RESULTS & SAMPLING PHOTOGRAPH

3.1 Site Temperature, Relative Humidity and Wind Rose summary recorded at **A1** on **29th DECEMBER 2016**

Location	Sampling Time	Site Temperature (Deg. C)	Relative Humidity (%)
A1	08.00 am	27.0	93
	09.00 am	27.9	92
	10.00 am	28.6	91
	11.00 am	29.8	90



3.2 Analysis results of Total Suspended Particulate monitored at **A1** on **29th DECEMBER 2016 – 30th DECEMBER 2016**

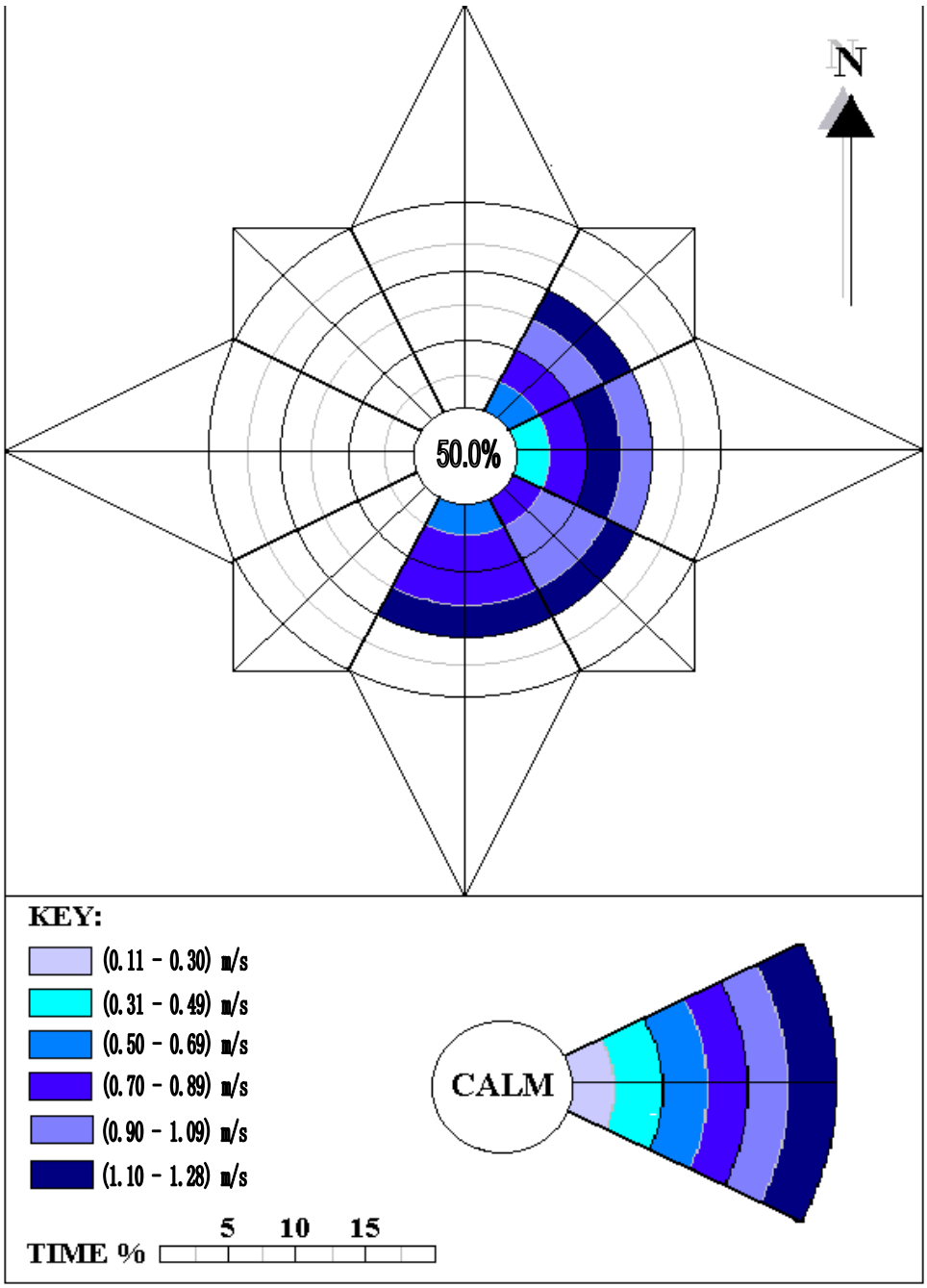
Test Parameter	Sampling Time	Result	*Malaysian Guidelines
Particulate Matter, PM 10	**29/12/2016 – 30/12/2016** 07.00 am – 07.00 am	42 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter, PM 2.5	**29/12/2016 – 30/12/2016** 07.00 am – 07.00 am	21 $\mu g/m^3$	75 $\mu g/m^3$
Sulphur Dioxide (SO2)	**29/12/2016 – 30/12/2016** 07.00 am – 07.00 am	ND (<5) $\mu g/m^3$	105 (μg/m3)
Nitrogen Dioxide (NO2)	**29/12/2016** 09.00 am – 10.00 am	ND (<5) $\mu g/m^3$	320 (μg/m3)
Carbon Monoxide (CO)	**29/12/2016** 10.30 am – 11.30 am	ND (<2) mg/m^3	35 mg/m^3

Note:

1) * means Recommended Malaysian Ambient Air Quality Guidelines (RMAQG).

3.3 Site Temperature, Relative Humidity and Wind Rose summary recorded at **A2** on **30th DECEMBER 2016**

Location	Sampling Time	Site Temperature (Deg. C)	Relative Humidity (%)
A2	08.00 am	28.1	92
	09.00 am	29.4	91
	10.00 am	30.5	90
	11.00 am	31.0	89



3.4 Analysis results of Total Suspended Particulate monitored at **A2** on **30th DECEMBER 2016 – 31st DECEMBER 2016**

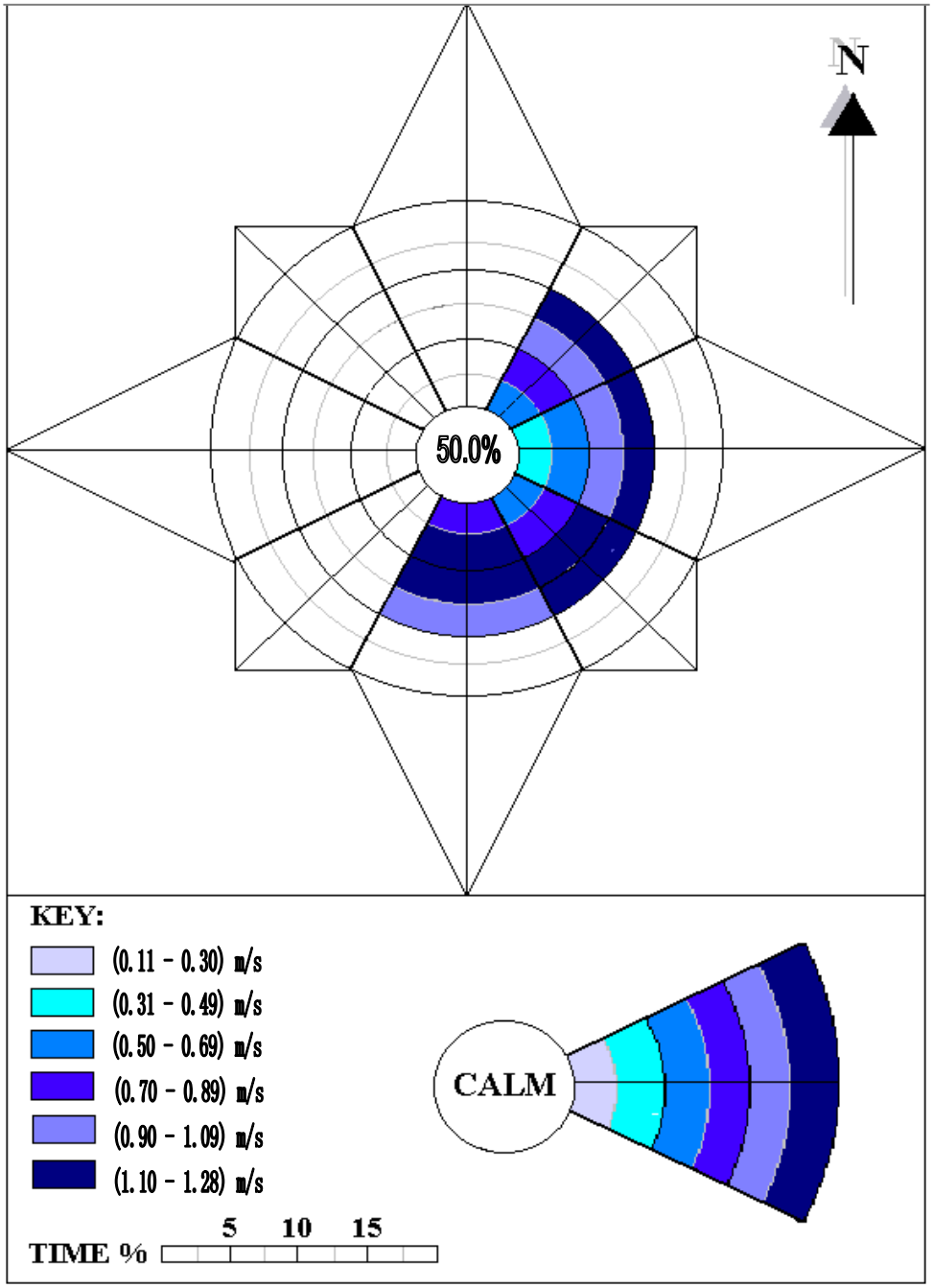
Test Parameter	Sampling Time	Result	*Malaysian Guidelines
Particulate Matter, PM 10	**30/12/2016 – 31/12/2016** 07.00 am – 07.00 am	40 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter, PM 2.5	**30/12/2016 – 31/12/2016** 07.00 am – 07.00 am	16 $\mu g/m^3$	75 $\mu g/m^3$
Sulphur Dioxide (SO2)	**30/12/2016 – 31/12/2016** 08.30 am – 08.30 am	ND (<5) $\mu g/m^3$	105 (μg/m3)
Nitrogen Dioxide (NO2)	**30/12/2016** 09.00 am – 10.00 am	ND (<5) $\mu g/m^3$	320 (μg/m3)
Carbon Monoxide (CO)	**30/12/2016 – 31/12/2016** 10.30 am – 11.30 am	ND (<2) mg/m^3	35 mg/m^3

Note:

1) * means Recommended Malaysian Ambient Air Quality Guidelines (RMAQG).

3.5 Site Temperature, Relative Humidity and Wind Rose summary recorded at **A3** on **31st DECEMBER 2016**

Location	Sampling Time	Site Temperature (Deg. C)	Relative Humidity (%)
A3	09.00 am	29.3	90
	10.00 am	30.5	89
	11.00 am	31.1	88
	12.00 pm	32.4	88



3.6 Analysis results of Total Suspended Particulate monitored at **A3** on **31st DECEMBER 2016 – 01st JANUARY 2017**

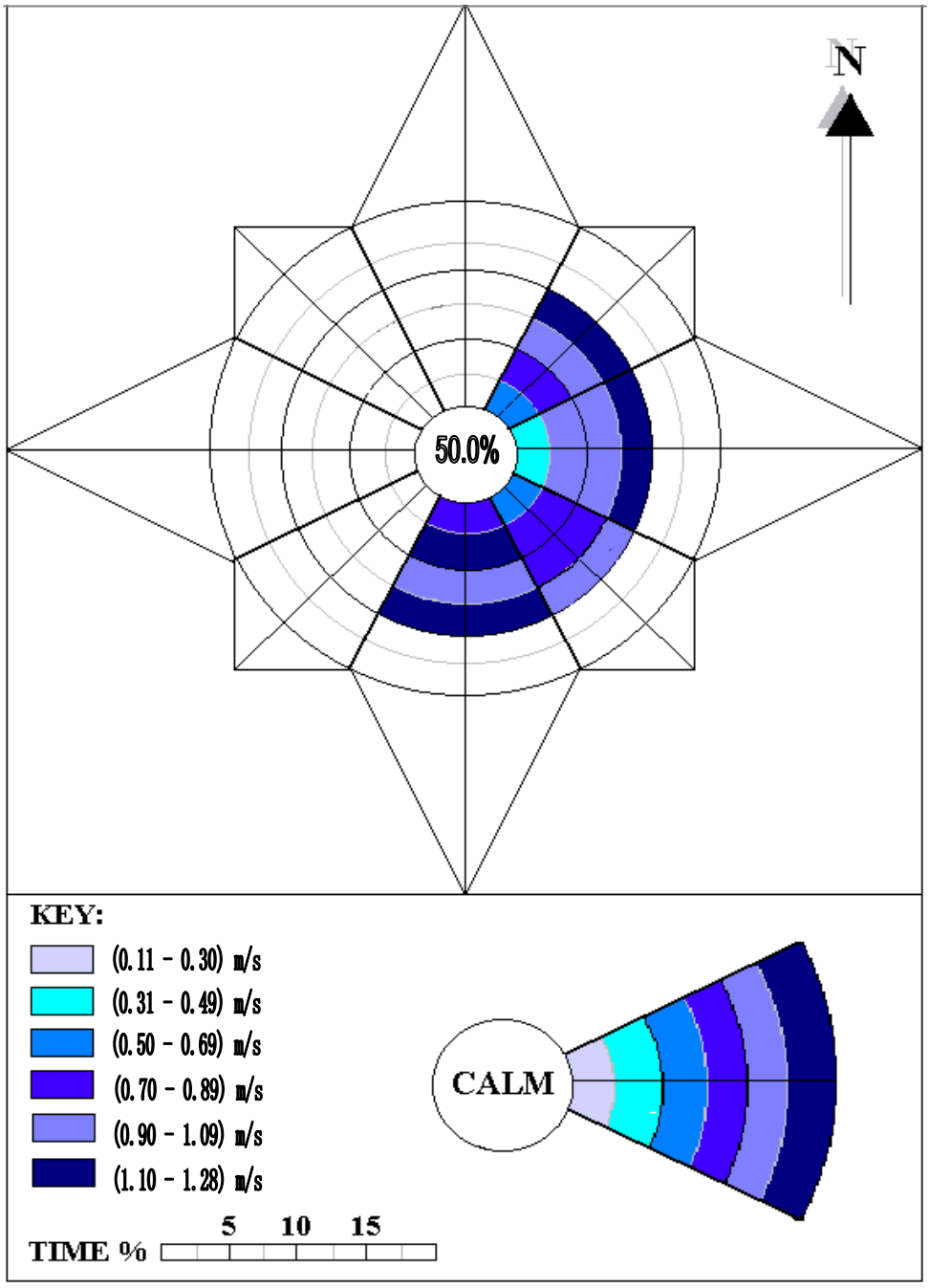
Test Parameter	Sampling Time	Result	*Malaysian Guidelines
Particulate Matter, PM 10	**31/12/2016 – 01/01/2017** 07.00 am – 07.00 am	32 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter, PM 2.5	**31/12/2016 – 01/01/2017** 07.00 am – 07.00 am	17 $\mu g/m^3$	75 $\mu g/m^3$
Sulphur Dioxide (SO2)	**31/12/2016 – 01/01/2017** 08.00 am – 08.00 am	ND (<5) $\mu g/m^3$	105 (μg/m3)
Nitrogen Dioxide (NO2)	**31/12/2016** 09.30 am – 10.30 am	ND (<5) $\mu g/m^3$	320 (μg/m3)
Carbon Monoxide (CO)	**31/12/2016 – 01/01/2017** 11.30 am – 12.30 pm	ND (<2) mg/m^3	35 mg/m^3

Note:

1) * means Recommended Malaysian Ambient Air Quality Guidelines (RMAQG).

3.7 Site Temperature, Relative Humidity and Wind Rose summary recorded at **A4** on **01st JANUARY 2017**

Location	Sampling Time	Site Temperature (Deg. C)	Relative Humidity (%)
A4	08.00 am	28.1	92
	09.00 am	29.6	91
	10.00 am	30.4	90
	11.00 am	31.0	88



3.8 Analysis results of Total Suspended Particulate monitored at **A4** on **01st JANUARY 2017 – 02nd JANUARY 2017**

Test Parameter	Sampling Time	Result	*Malaysian Guidelines
Particulate Matter, PM 10	**01/01/2017 – 02/01/2017** 07.00 am – 07.00 am	30 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter, PM 2.5	**01/01/2017 – 02/01/2017** 07.00 am – 07.00 am	14 $\mu g/m^3$	75 $\mu g/m^3$
Sulphur Dioxide (SO2)	**01/01/2017 – 02/01/2017** 08.00 am – 08.00 am	ND (<5) $\mu g/m^3$	105 (μg/m3)
Nitrogen Dioxide (NO2)	**01/01/2017** 09.30 am – 10.30 am	ND (<5) $\mu g/m^3$	320 (μg/m3)
Carbon Monoxide (CO)	**01/01/2017 – 02/01/2017** 11.30 am – 12.30 pm	ND (<2) mg/m^3	35 mg/m^3

Note:

1) * means Recommended Malaysian Ambient Air Quality Guidelines (RMAQG).

SAMPLING PHOTOGRAPHS

POINT A1

POINT A2

POINT A3

POINT A4

4.0 CONCLUSION

Generally, the Environmental Air Quality monitored for **"ENVIRONMENTAL MONITORING AT KLEBANG, MELAKA"** at **Point A1, Point A2, Point A3** and **Point A4** has been carried out successfully on **29th DECEMBER 2016 – 02nd JANUARY 2016** and the results were found to be **within** the Malaysian Recommended Air Quality Guidelines.

Reported by,

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