



大成環境科技拓展有限公司  
**ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED**

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group  
豐盛創建成員 Member of FSE Holdings

## **Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1**

### **Baseline Environmental Monitoring Report**

Flat A, 19/F, Chaiwan Industrial Centre, 20 Lee Chung Street, Chai Wan, Hong Kong Tel: (852) 2556 9172 Fax: (852) 2856 2010  
香港柴灣利眾街 20 號柴灣中心工業大廈 19 字樓 A 座 電話: (852) 2556 9172 傳真: (852) 2856 2010 <http://www.epsl.com.hk>



## **APPROVAL SHEET**

Prepared and Certified by:

Environmental Team Leader (Environmental Pioneers & Solutions Limited)

Signature:  \_\_\_\_\_

Ms. Goldie Fung  
(ET Leader)

Date: 19 November 2015

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## **EXECUTIVE SUMMARY**

This baseline monitoring report presents the baseline air quality and noise monitoring results performed from 31<sup>st</sup> October 2015 to 13<sup>th</sup> November 2015.

1 time 30-min  $L_{Aeq}$  of NM1, NM2, NM3, NM4 and NM5 and 3 times 1-hr Total Suspended Particulates (TSP) of AM1, AM2, AM3 and AM4 for day time (07:00 to 19:00) baseline monitoring for 14 consecutive days were conducted as stipulated in their respective sections in the Environmental Monitoring and Audit Manual. Data obtained from the monitoring was processed to establish action and limit levels.

Details of the monitoring location and results are presented in this baseline monitoring report.

24-hr TSP baseline monitoring for AM1, AM2, AM3 and AM4 was not carried out in the mentioned monitoring period. The presentation of 24-hr TSP baseline monitoring is not included in this report. The details of 24-hr TSP baseline monitoring will be presented in a separate report.

## **1. INTRODUCTION**

### **1.1 Project Background Information**

This is a road improvement project in West Kowloon Reclamation Development (WKRd) for completing the developments and the commissioning of the new transport facilities.

Apart from the additional traffic impacts arising from the major development and transport facilities in WKRd, several major junctions in the area are currently operating with insufficient capacity causing serious congestion to some existing major road corridors such as Jordan Road (JRD), Ferry Street (FST) and Canton Road (CRD).

To enhance the road network of the area, Transport Department commissioned the “West Kowloon Reclamation Development Traffic Study” which identified and recommended Core and Additional Schemes together with the improvement works at the junction of CRD/FST/JRD. Implementation of these schemes would enable most of the key road junctions in the study area to operate with spare capacity, and the traffic queue length would also be reduced avoiding blockage to the upstream junctions.

In accordance with the requirements stated in the Environmental Permit (no.: EP-455/2013) based on the Environmental Monitoring and Audit (EM&A) Manual and reference to Annex 21 Technical Memorandum under the Environmental Impact Assessment Ordinance (EIAO-TM), baseline monitoring of air quality and noise are required to be carried out prior to the commencement of construction of the project.

### **1.2 Purpose**

By establishing the baseline level of air quality and noise, the performance of the construction contractor shall be measured in meeting required environmental protection standards and requirements of the EM&A Manual. This report presents the methodology, monitoring location, equipment, period, results and observations for the environmental measurements during the baseline monitoring period.

## 2. AIR QUALITY MONITORING

According to the EM&A Manual, monitoring of the Total Suspended Particulate (TSP) levels should be carried out for 3 sets of 1-hr TSP and 1 set of 24-hr TSP at four monitoring locations.

Due to the coordination with the representative of premise for installation of High Volume Sample at AM1 is in progress and the installations of High Volume Sampler at AM2, AM3 and AM4 were rejected by the representatives/ property management of premises, the 24-hr TSP baseline monitoring was not commenced in the same monitoring period as 1-hr TSP monitoring. Supporting documents for coordination and rejection of High Volume Sampler installation are shown in **Appendix A**. A proposal for the 24-hr TSP monitoring with proposed alternative monitoring locations and methodologies will be submitted separately. The baseline monitoring of 24-hr TSP will be carried out right after the proposal is approved. Therefore, only 1-hr TSP baseline monitoring will be presented in this report.

### 2.1 Monitoring Methodology and Parameters

Monitoring was undertaken to establish 1-hr TSP baseline levels of this project, and to provide data to establish action and limit levels in comparison to baseline levels.

1-hr TSP baseline monitoring has been carried out for 14 consecutive days from 31<sup>st</sup> October 2015 to 13<sup>th</sup> November 2015.

Measurements of 1-hr TSP monitoring were taken by a Dust Trak aerosol monitor or its equivalent that is a portable and battery-operated laser photometer capable of performing real time 1-hr TSP measurements.

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the dust monitor.
- Zero Cal was conducted to the dust monitor to each test for ensuring more accurate data.
- Logging setup and Instrument setup such as log interval, test length, number of test and impactor adaptor will set as follows:

- log interval : 1min
- test length : 60mins
- number of test : 3
- Impactor adaptor: 10 $\mu$  (PM<sub>10</sub>)
- Start the monitoring lasting 3 hours for each monitoring location
- At the end of the monitoring period, the Average, Maximum and Minimum of each TSP test shall be recorded.

Data of wind speed and wind direction was extracted from King's Park Meteorological Station of Hong Kong Observatory. The collection of wind data meets the prescribed criteria in S.3.4.3 of the EM&A Manual.

Other relevant data such as monitoring location, time, weather conditions and any other special phenomena at the construction site were recorded during the measurement period. The monitoring parameters and frequency are summarized in **Table 2.1**.

Table 2.1 – 1-hr TSP Baseline Monitoring Parameters and Frequency

Parameter	Frequency	Monitoring Period
1-hr TSP	3 times per day	14 consecutive days

## 2.2 Monitoring Locations

Monitoring for 1-hr TSP was conducted at four locations. Details are shown in **Table 2.2** and **Appendix A**.

Table 2.2 – 1-hr TSP Baseline Monitoring Location

Identification No.	TSP Monitoring Location	Description	Parameter
AM1	Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building	Ground Floor Face to Hoi Po Road	1hr-TSP
AM2	Garden Building	Ground Floor Face to Canton Road	1hr-TSP
AM3	The Cullinan I	Ground Floor Face to Nga Cheung Road	1hr-TSP
AM4	Lai Chack Middle School	Ground Floor Face to Canton Road	1hr-TSP

## 2.3 Monitoring Equipment

3 sets of 1-hr TSP were carried out by the portable dust meter. The measurement equipment is listed in **Table 2.3** and Calibration Certificates of the equipment is shown in **Appendix B**.

Table 2.3 Air Quality Monitoring Equipment

Equipment	Manufacturer & Model No.	Parameter
Dusk Trak aerosol monitor	AM510 (SN:11510002) AM510 (SN:11510003) AM510 (SN:11510004) AM510 (SN:11510005)	TSP (1-hr)

## 2.4 Quality Assurance / Quality Control Results and Detection Limits

The portable dust meter was calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the dust meter meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in **Appendix B**.

## 2.5 Monitoring Results and Observations

There were total 168 sets of 1-hr TSP monitoring data obtained at the monitoring locations. The monitoring results are summarized in **Table 2.4**. All monitoring data and the graphical plot are shown in **Appendix C**.

Table 2.5 Summary of average 1-hr TSP Baseline Monitoring Results

Monitoring Location	Average 1-hr TSP ( $\mu\text{g}/\text{m}^3$ )
AM1	58
AM2	76
AM3	76
AM4	82

During the monitoring period, vehicle emissions were identified as one of the main dust sources for AM1, AM2, AM3 and AM4. Construction activities from other construction sites near Canton Road were the influencing factors for AM4.



## 2.6 Action and Limit Levels

According to the EM&A Manual, the criteria of establishing Action and Limit levels of 1-hr TSP are summarized in **Table 2.6.1**.

Table 2.6.1 Action and Limit Levels for 1-hr TSP

Cases	Action Level	Limit Level
Averaged baseline level $\leq 384 \mu\text{g}/\text{m}^3$	$= (\text{Baseline level} \times 1.3 + \text{Limit level}) / 2$	$500 \mu\text{g}/\text{m}^3$
Averaged baseline level $> 384 \mu\text{g}/\text{m}^3$	$= \text{Limit level}$	

The baseline monitoring results have formed the basis of air quality requirements for the impact monitoring. According to the measured baseline results, Action and Limit levels for 1-hr TSP impact monitoring are established in **Table 2.6.2**.

Table 2.6.2 Established 1-hr TSP Action and Limit Levels

Monitoring Location	Monitoring Frequency	Action Level	Limit Level
AM1	1-hr	$288 \mu\text{g}/\text{m}^3$	$500 \mu\text{g}/\text{m}^3$
AM2	1-hr	$299 \mu\text{g}/\text{m}^3$	
AM3	1-hr	$299 \mu\text{g}/\text{m}^3$	
AM4	1-hr	$303 \mu\text{g}/\text{m}^3$	

### 3. NOISE MONITORING

#### 3.1 Monitoring Methodology and Parameters

Monitoring was undertaken to establish baseline noise levels of this project, and to provide data against which any environmental impacts due to construction activities can be compared.

The baseline noise level was measured in terms of the A-weighted equivalent continuous sound pressure level of  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$ . The measurement time period are shown as below:

$L_{eq}$  (30min) for time period between 0700 – 1900 hours

The monitoring parameters, frequency and duration of baseline noise monitoring are summarized in **Table 3.1**. Consecutive noise measurements were carried out for 14 consecutive days (31<sup>st</sup> October 2015 to 13<sup>th</sup> November 2015).

Table 3.1 - Noise Monitoring Parameters, Frequency and Period

Time Period	Duration	Parameters
0700-1900	30 minutes	$L_{eq}$ , $L_{10}$ , $L_{90}$

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time will set as follows:
  - frequency weighting : A
  - time weighting : Fast
- Prior to and after noise measurement, the meter shall be calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
- Noise monitoring should be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. Noise

measurement should be paused during periods of high intrusive noise if possible and observation shall be recorded when intrusive noise is not avoided.

- At the end of the monitoring period, the Leq, L<sub>10</sub> and L<sub>90</sub> shall be recorded. In addition, site conditions and noise sources should be recorded.

### 3.2 Monitoring Locations

Noise monitoring was established at five locations, which is summarized in **Table 3.2** and shown in **Appendix A**.

Measurement should normally be taken at a point 1m from the exterior of the sensitive receivers building façade. The measurement point should be at a position 1.2m above ground.

Table 3.2 Baseline Noise Monitoring Location

Identification No.	Noise Monitoring Location	Description	Measurement Type
NM1	Sorrento - Tower 1	Ground Floor Face to Nga Cheung Road	Façade
NM2	Yau Ma Ti Catholic Primary School (Hoi Wang Road)	Ground Floor Face to Hoi Ting Road	Façade
NM3	The Cullinan I	Ground Floor Face to Nga Cheung Road	Façade
NM4	Lai Chack Middle School	Ground Floor Face to Canton Road	Façade
NM5	Yue Tak Building	Ground Floor Face to Jordan Road	Façade

### 3.3 Monitoring Equipment

Baseline monitoring was conducted by using BSWA 806 which complied with the International Electrotechnical Commission Publications 61672:2002 (Type 1), 60651:1979 (Type 1) and 60804:1985 (Type 1) Specifications as referred to the Technical Memorandum to the Noise Control Ordinance. The equipment was calibrated and verified by certified laboratory or manufacturer every year to ensure they can perform to the same level of accuracy as stated in the manufacturer's specification. Before and after the baseline measurement, the reading of sound level meter was checked with the acoustic calibrator and the measurements were accepted as valid if the

calibration levels before and after the noise measurement agreed to within 1.0 dB. The measurement equipment is listed in **Table 3.3** and Calibration Certificates of the equipment is shown in **Appendix B**.

Table 3.3 Equipment List for Noise Monitoring

Equipment	Manufacturer & Model No.	Precision Grade	Qty
Integrated sound level meter	BSWA 806 (SN:34461)	IEC 61672 Type 1	1
Acoustical calibrator	NC-74 (SN:34857296)	IEC 60942 Type 1	1

### 3.4 Quality Assurance / Quality Control Results and Detection Limits

The sound level meter and calibrator were calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the sound level meter meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in **Appendix B**.

### 3.5 Monitoring Results and Observations

Monitoring during the daytime period (0700-1900) on normal weekdays is represented with a logging interval of 30 minutes. The monitoring results are summarized in **Table 3.5**. All monitoring data and the graphical plot are shown in **Appendix C**.

Table 3.5 Summary of Day-Time (0700-1900) Monitoring Results

Daytime (0700-1900)	Noise Level, dB(A) Leq (30 min)		
	L <sub>Aeq</sub>	L <sub>10</sub>	L <sub>90</sub>
NM1	75.1	78.1	70.6
NM2	66.5	69.6	62.5
NM3	74.5	77.4	70.4
NM4	73.3	76.4	68.0
NM5	71.8	74.7	67.6

During the monitoring period, traffic noise was identified as the main noise source nearby.

The weather conditions during the monitoring period were mostly fine. No noise monitoring was conducted under increment weather condition such as in the presence

of fog, rain, and wind with a steady speed exceeding 5 m/s or gust exceeding 10 m/s.

According to the Baseline monitoring result, the noise levels of some monitoring stations are on the high side. A corrective calculation method for impact monitoring is suggested to make.

The noise correction will be adopted when the measured noise levels exceed the corresponding baseline level. The correction would take into account the effect of the background/baseline noise levels. The corresponding baseline noise level will be used for such correction. The corrected noise level due to the construction works will be calculated by the following formula:

$$\text{CNL} = 10 \log (10^{\text{MNL}/10} - 10^{\text{BNL}/10})$$

CNL = Corrected Noise Level

MNL = Measured Noise Level

BNL = Baseline Noise Level

### **3.6 Action and Limit Levels**

The Action and Limit Levels were established in accordance with the EM&A Manual. The baseline noise level shall be referenced during the compliance check in the impact noise monitoring period. For restricted periods, limit level shall be subjected to the control under the Noise Control Ordinance (NCO) and the condition in the Construction Noise Permit (CNP).

The Action and Limit levels are shown in **Table 3.6**, which would be applied for compliance assessment of construction noise for this project.

Table 3.6 Action and Limit Levels for Construction Noise at All Sensitive Receivers

Time Period	Location	Action	Limit
Daytime 0700 – 1900 hrs on normal weekdays	NM1	When one documented complaint is received	75 dB(A)
	NM2		70 dB(A) / 65dB(A)*
	NM3		75 dB(A)
	NM4		70 dB(A) / 65dB(A)*
	NM5		75 dB(A)

Remark:

\* 70dB(A) and 65dB(A) for schools during normal teaching periods and school examination periods, respectively

#### **4. REVISIONS FOR INCLUSION IN THE EM&A MANUAL**

1-hr Total Suspended Particulates (TSP) and Noise baseline monitoring for 14 consecutive days have been conducted in accordance with to the EM&A Manual.

According to EM&A Manual Section 3.2, the monitoring parameters of air quality monitoring are defined. However, the 24-hr TSP monitoring was not commenced in the same monitoring period as 1-hr TSP monitoring due to the infeasibility of HVS installation.

Installations of HVS at AM2, AM3 and AM4 were rejected by the representatives / property management of premises. The 24-hr TSP cannot be carried out at the designated locations, AM2, AM3 and AM4, in accordance with the EM&A Manual. Arrangement of alternative monitoring locations for 24-hr TSP is in pending stage. The conditions given in S.3.5.1 of the EM&A Manual were been taken into account for choosing the alternative locations. The details of 24-hr TSP monitoring shall be reported in a separate proposal.

The monitoring methodology, parameters and locations for 1-hr TSP and Noise monitoring are all in line with the EM&A Manual.

## 5. CONCLUSION

1-hr Total Suspended Particulates (TSP) and Noise baseline monitoring for 14 consecutive days have been conducted at timeframe when there is no construction works underwent by this project in the identified nearest sensitive receivers from 31<sup>st</sup> October 2015 to 13<sup>th</sup> November 2015.

The average 1-hr TSP was 58 $\mu\text{g}/\text{m}^3$  for AM1, 76 $\mu\text{g}/\text{m}^3$  for AM2, 76 $\mu\text{g}/\text{m}^3$  for AM3 and 82 $\mu\text{g}/\text{m}^3$  for AM4.

The established action level for 1-hr TSP measurement was 288 $\mu\text{g}/\text{m}^3$  for AM1, 299 $\mu\text{g}/\text{m}^3$  for AM2, 299 $\mu\text{g}/\text{m}^3$  for AM3 and 303 $\mu\text{g}/\text{m}^3$  for AM4.

The average  $L_{\text{Aeq}}$  (30min) for time period between 0700-1900 hours on normal weekdays was 75.1dB(A) for NM1, 66.5dB(A) for NM2, 74.5dB(A) for NM3, 73.3dB(A) for NM4 and 71.8dB(A) for NM5.

The established construction noise action level for all stations was “When one documented complaint is received”. The limit level was 75dB(A) for monitoring stations NM1, NM3 and NM5 and 70dB(A)/65 dB(A) for NM2 and NM4 during normal schooldays and examination period respectively.

24-hr TSP baseline monitoring for AM1, AM2, AM3 and AM4 was not carried out in the monitoring period as 1-hr TSP and noise baseline monitoring. The presentation of 24-hr TSP baseline monitoring is not included in this report. The details of 24-hr TSP baseline monitoring will be presented in a separate report.



# **Appendix A**

## Monitoring Locations and Supporting Documents



惠保建築有限公司  
VIBRO CONSTRUCTION CO LTD  
新創建築集團成員 Member of NWS Holdings

Our Ref.:S0747/VC201501-G01/JL/LC

16<sup>th</sup> October 2015

Marine Department  
Yau Ma Tei Marine Office  
38 Hoi Fai Road,  
Yau Ma Tei,  
Kowloon, Hong Kong

By Hand

Attn: To whom it may concern

Dear Sirs,

Contract No. HY/2013/17

**Road Improvement Works in West Kowloon Reclamation Development**  
**Installation of High Volume Sampler for Monitoring of Air Pollution**

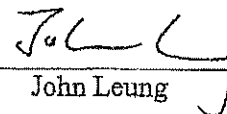
Please be advised that we are the Main Contractor of the Highways Department Contract No. HY/2013/17. As per Contract requirement, an air monitoring point is required to be set up on the rooftop of Yau Ma Tei Public Cargo Working Area Administrative Building to check the air quality nearby the site area at Hoi Fai Road. The information and proposed location of monitoring equipment are attached for your reference. The air monitoring work will be carried out until the end of Contract at Nov 2017.

We would seek your approval to install the air monitoring equipment and borrow power supply from your building for the captioned monitoring work.

If you have any queries, please feel free to contact Gary Wong at 6131 3821 or the Lavandar Chan at 6628 8983.

Thank you for your kind attention.

Yours faithfully,  
VIBRO CONSTRUCTION CO., LTD.



John Leung  
Site Agent  
(Contractor's Representative)

Encl.  
JL/lc  
c.c

Parsons Brinckerhoff (Asia) Ltd.

Attn: Mr. Angus Law

Environmental Pioneers & Solutions Limited

Attn: Ms. Goldie Fung

香港九龍灣宏開道八號其士商業中心十一樓 11/F Chevalier Commercial Centre, 8 Wang Hol Road, Kowloon Bay, Hong Kong  
電話 Tel: (852) 2137 5500 傳真 Fax: (852) 2137 5599 電郵 Email: email@vibro.com.hk 網址 Website: www.vibro.com.hk



AM



惠保建築有限公司

VIBRO CONSTRUCTION CO LTD

新創建築集團成員 Member of NWS Holdings

檔案編號.:S0720/VC201501-A01/JL/LC

公園大廈

By Hand

致: 業主立案法團

合約編號:HY/2013/17

西九龍填海發展道路改善工程

有關安裝空氣污染監測儀器事宜

來函目的記錄本公司曾於七月二日到訪 貴大廈商討有關安裝二十四小時空氣污染監測儀器(HVS)事宜。得悉 貴大廈將會進行大型維修工程，因此拒絕本公司安裝空氣監測儀器安排。

如有任何查問，請致電 6628 8983 陳小姐。

此致

公園大廈業主立案法團

惠保建築有限公司

梁金輝  
地盤總管  
(承建商代表)

二零一五年十月九日

cc

Parsons Brinckerhoff Asia Co., Ltd Attn: Mr. Angus Law

AMZ GARDEN Bldg



惠保建築有限公司  
VIBRO CONSTRUCTION CO LTD

新創建集團成員 Member of NWS Holdings

檔案編號: S0763/VC201501-A01/JL/LC

天璽

柯士甸道西 1 號圓方

致: 業主立案法團

By Hand

合約編號: HY/2013/17

西九龍填海發展道路改善工程  
有關安裝空氣污染監測儀器事宜

來函目的記錄本公司曾於七月二日到訪 貴樓宇商討有關安裝二十四小時空氣污染監測儀器(HVS)事宜。得悉 貴樓宇因屬於私人地方而不便進行定期監測，因此拒絕本公司安裝空氣監測儀器安排。

如有任何查問，請致電 6628 8983 陳小姐。

此致

天璽業主立案法團

惠保建築有限公司

JOLLY

梁金輝  
地盤總管  
(承建商代表)

二零一五年十月九日

cc

Parsons Brinckerhoff Asia Co., Ltd Attn: Mr. Angus Law  
Environmental Pioneers &

Solutions Limited

Attn: Ms. Goldie Fung



惠保建築有限公司  
VIBRO CONSTRUCTION CO LTD  
新創集團成員 Member of NWS Holdings

檔案編號: S0719/VC201501-A01/JL/LC

麗澤中學

By Hand

致: 校長先生

合約編號: HY/2013/17  
西九龍填海發展道路改善工程  
有關安裝空氣污染監測儀器事宜

來函目的記錄本公司曾於七月二日到訪 貴校商討有關安裝二十四小時空氣污染監測儀器(HVS)事宜。得悉 貴校無法提供合適位置擺設監測儀器，因此拒絕本公司安裝空氣監測儀器安排。

如有任何查問，請致電 6628 8983 陳小姐。

此致

麗澤中學校長先生

惠保建築有限公司

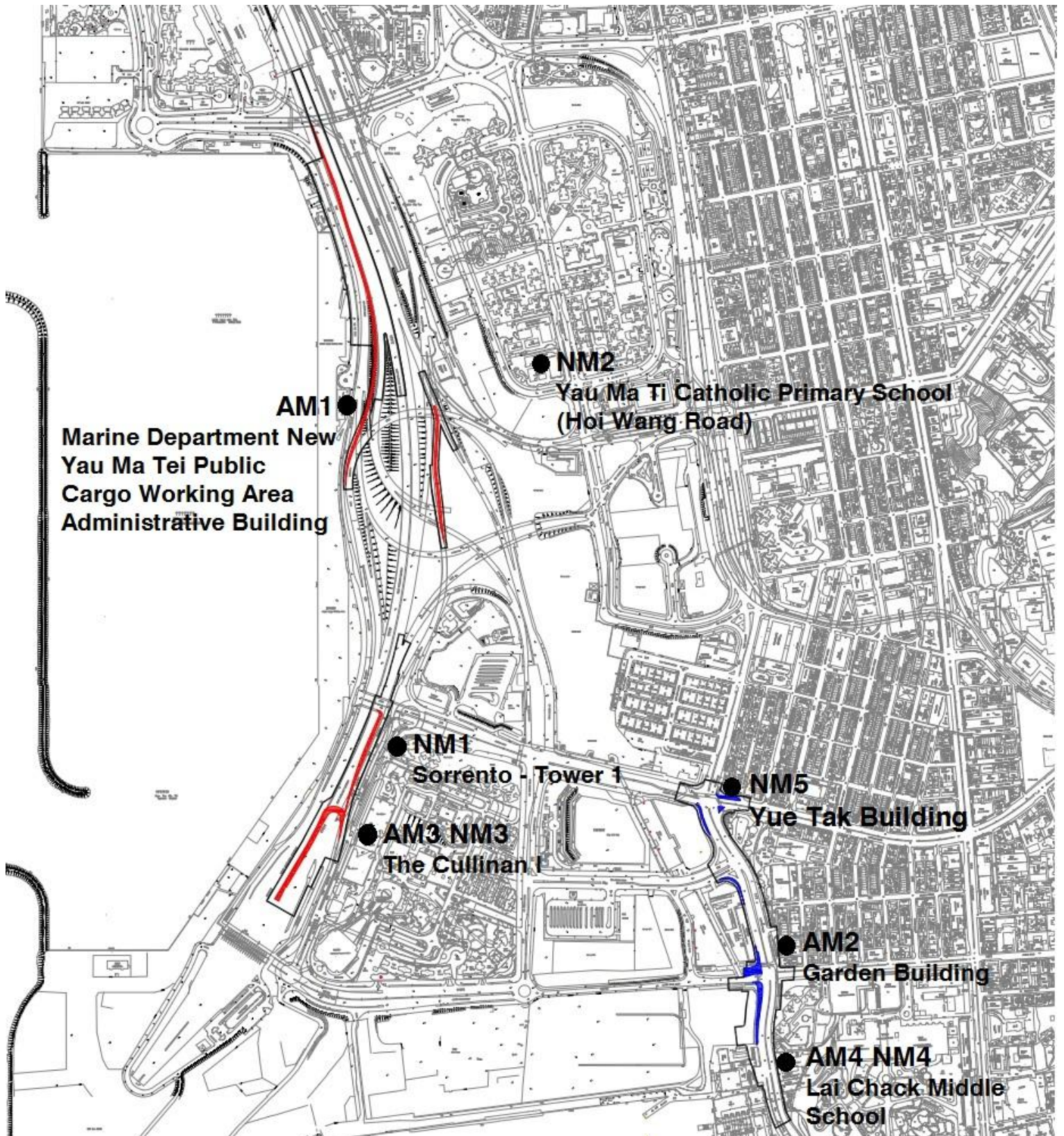
梁金輝  
地盤總管  
(承建商代表)

二零一五年十月九日





cc






Parsons Brinckerhoff Asia Co., Ltd Attn: Mr. Angus Law

Am4





Monitoring Location	Photo Record
<p>AM1</p> <p>Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building</p>	
<p>AM2</p> <p>Garden Building</p>	
<p>AM3</p> <p>The Cullinan I</p>	
<p>AM4</p> <p>Lai Chack Middle School</p>	

Monitoring Location	Photo Record
<p>NM1</p> <p>Sorrento - Tower 1</p>	
<p>NM2</p> <p>Yau Ma Ti Catholic Primary School (Hoi Wang Road)</p>	
<p>NM3</p> <p>The Cullinan I</p>	
<p>NM4</p> <p>Lai Chack Middle School</p>	
<p>NM5</p> <p>Yue Tak Building</p>	



## **Appendix B**

### **Calibration Certificate**



# CERTIFICATE OF CALIBRATION AND TESTING

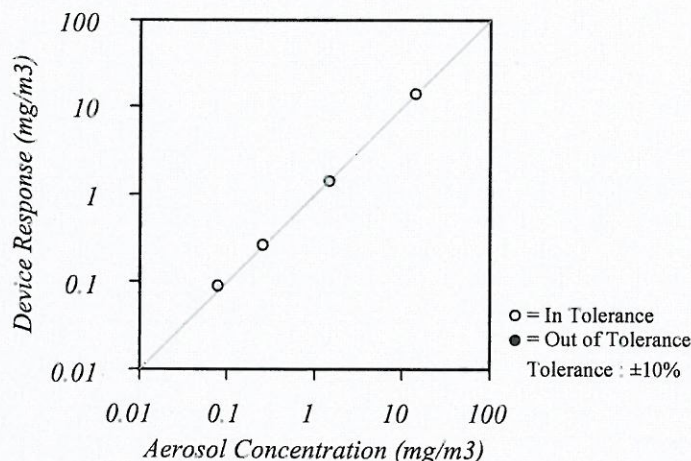
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510002
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left  
☐ As Found

☒ In Tolerance  
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal	Cal Due
Photometer	E003433	09-09-15	03-09-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16
Temp/Humidity	E005409	04-16-15	04-16-16
Pressure	E003440	08-04-15	08-04-16

Measurement Variable	System ID	Last Cal	Cal Due
Flowmeter	E002371	03-02-15	03-02-16
Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005410	04-17-15	04-17-16

*Linda Hillheimer*

Calibrated

☒ Final Function  
Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

## **REPORT OF EQUIPMENT CALIBRATION**

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### **INSTRUMENT DESCRIPTION**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510002
Date of Issue:	27/10/2015
Date of Calibration:	12/10/2015
Date of Next Calibration:	11/10/2016

### **ISSUING ORGANISATION**

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre  
20 Lee Chung Street  
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John  
Manager





大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

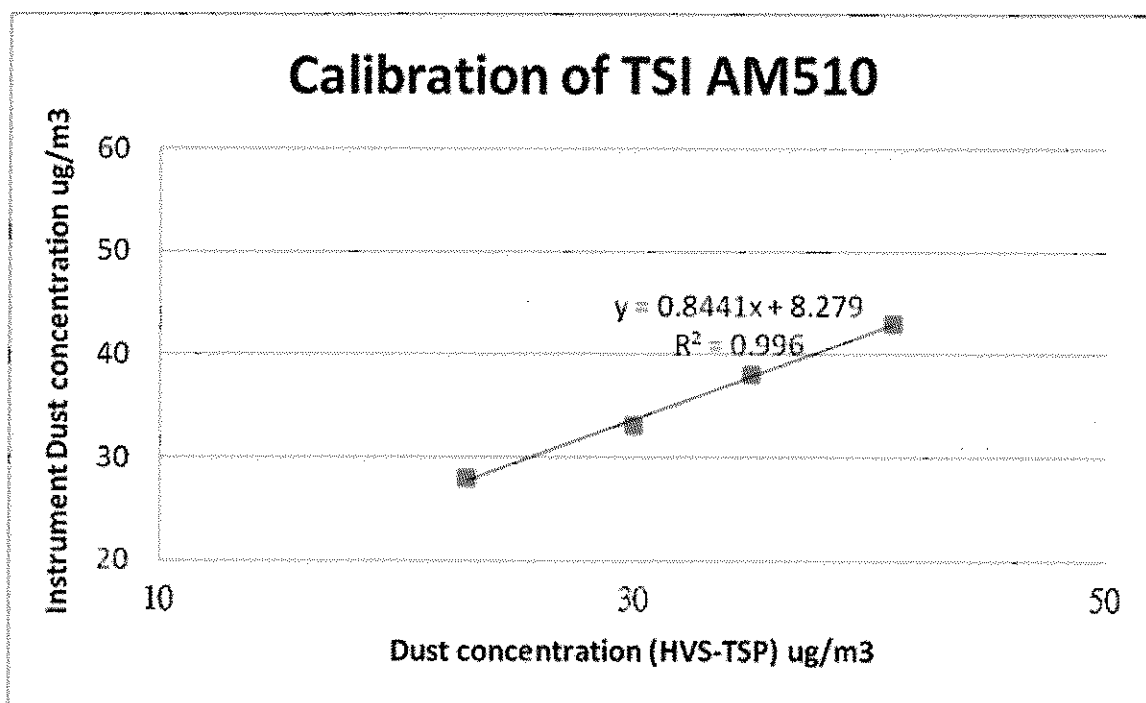
豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

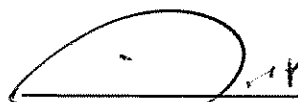
豐盛創建成員 Member of FSE Holdings

Brand Name: TSI  
Model No.: AM510  
Serial No.: 11510002  
HVS No.: TE-5028A  
HVS Calibration Kit No.: TISCH 2137  
Date of Calibration: 12/10/2015  
Date of next Calibration: 11/10/2016

#### Calibration Record

HVS - TSP	23	30	35	41
TSI AM510	28	33	38	43



  
Mr. Ip Wing Hong, John  
Manager



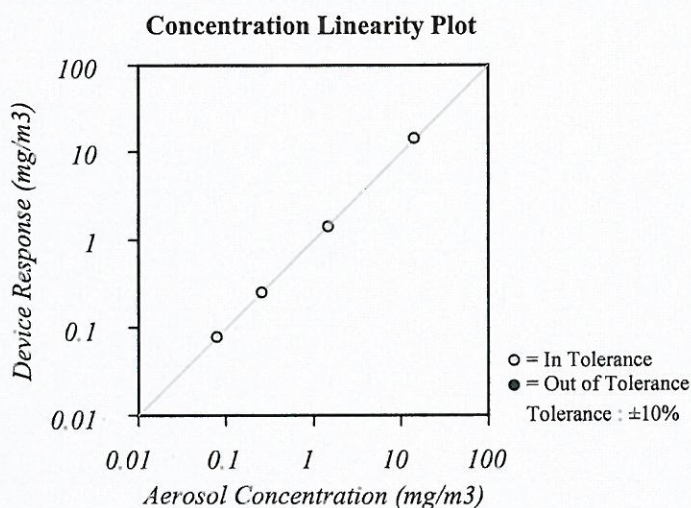
# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510003
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	mHg (hPa)		

☒ As Left  
☐ As Found

☒ In Tolerance  
☐ Out of Tolerance



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal	Cal. Due
Photometer	E003433	09-09-15	03-09-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16
Temp/Humidity	E005409	04-16-15	04-16-16
Pressure	E003440	08-04-15	08-04-16

Measurement Variable	System ID	Last Cal.	Cal. Due
Flowmeter	E002371	03-02-15	03-02-16
Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005410	04-17-15	04-17-16

*Linda Hill-Kramer*

Calibrated

☒ Final Function Check

October 2, 2015

Date





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ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

## **REPORT OF EQUIPMENT CALIBRATION**

### **INSTRUMENT DESCRIPTION**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510003
Date of Issue:	27/10/2015
Date of Calibration:	12/10/2015
Date of Next Calibration:	11/10/2016

### **ISSUING ORGANISATION**

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre  
20 Lee Chung Street  
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John  
Manager



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ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

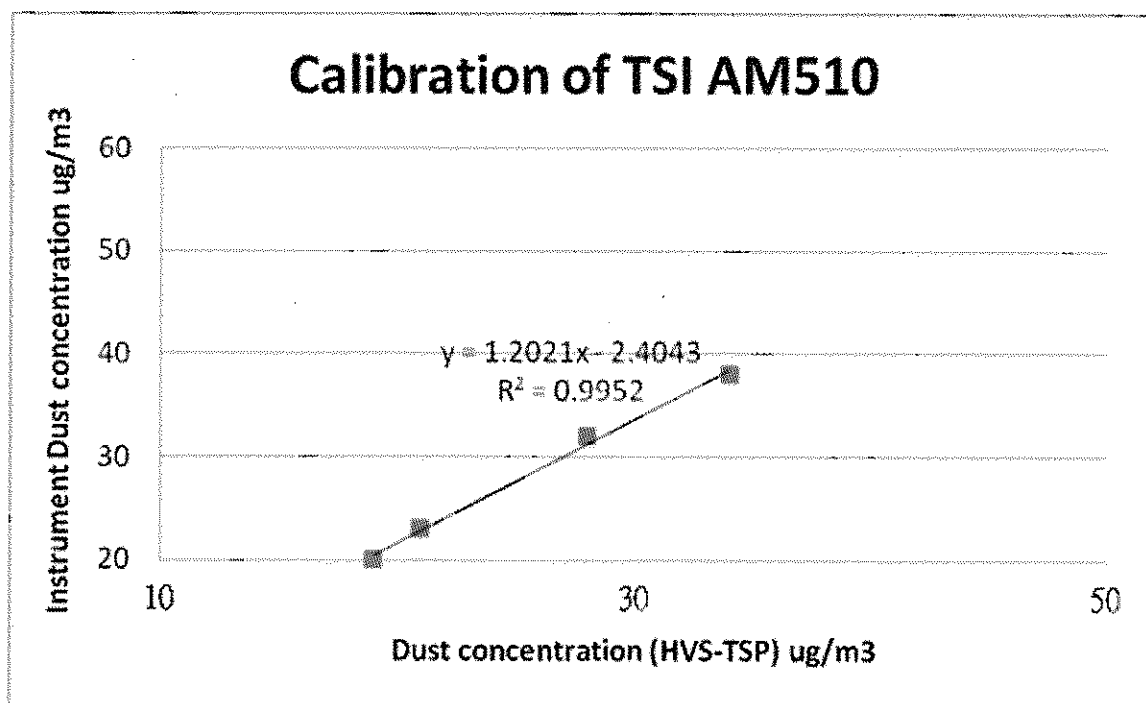
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豐盛創建成員 Member of FSE Holdings

Brand Name: TSI  
Model No.: AM510  
Serial No.: 11510003  
HVS No.: TE-5028A  
HVS Calibration Kit No.: TISCH 2137  
Date of Calibration: 12/10/2015  
Date of next Calibration: 11/10/2016

#### Calibration Record

HVS - TSP	19	21	28	34
TSI AM510	20	23	32	38



Mr. Ip Wing Hong, John  
Manager





# CERTIFICATE OF CALIBRATION AND TESTING

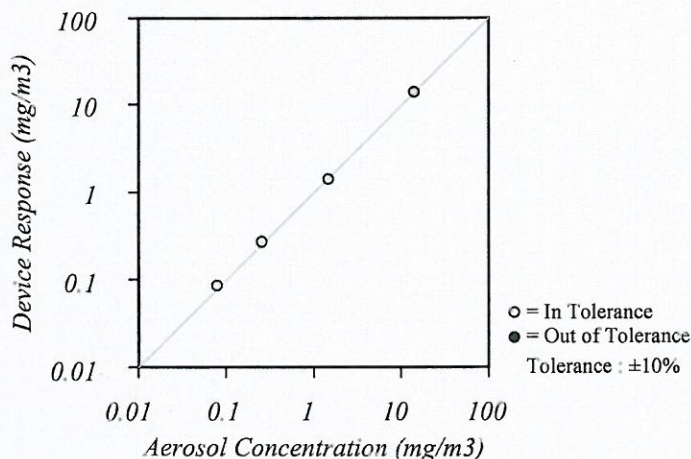
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510004
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left  
☐ As Found

☒ In Tolerance  
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E003433	09-09-15	03-09-16	Flowmeter	E002371	03-02-15	03-02-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16	Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005409	04-16-15	04-16-16	Temp/Humidity	E005410	04-17-15	04-17-16
Pressure	E003440	08-04-15	08-04-16				

*Linda Hillshamer*

Calibrated

☒ Final Function  
Check

October 2, 2015

Date





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ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

## **REPORT OF EQUIPMENT CALIBRATION**

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### **INSTRUMENT DESCRIPTION**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510004
Date of Issue:	27/10/2015
Date of Calibration:	13/10/2015
Date of Next Calibration:	12/10/2016

### **ISSUING ORGANISATION**

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre  
20 Lee Chung Street  
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

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Mr. Ip Wing Hong, John  
Manager



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ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

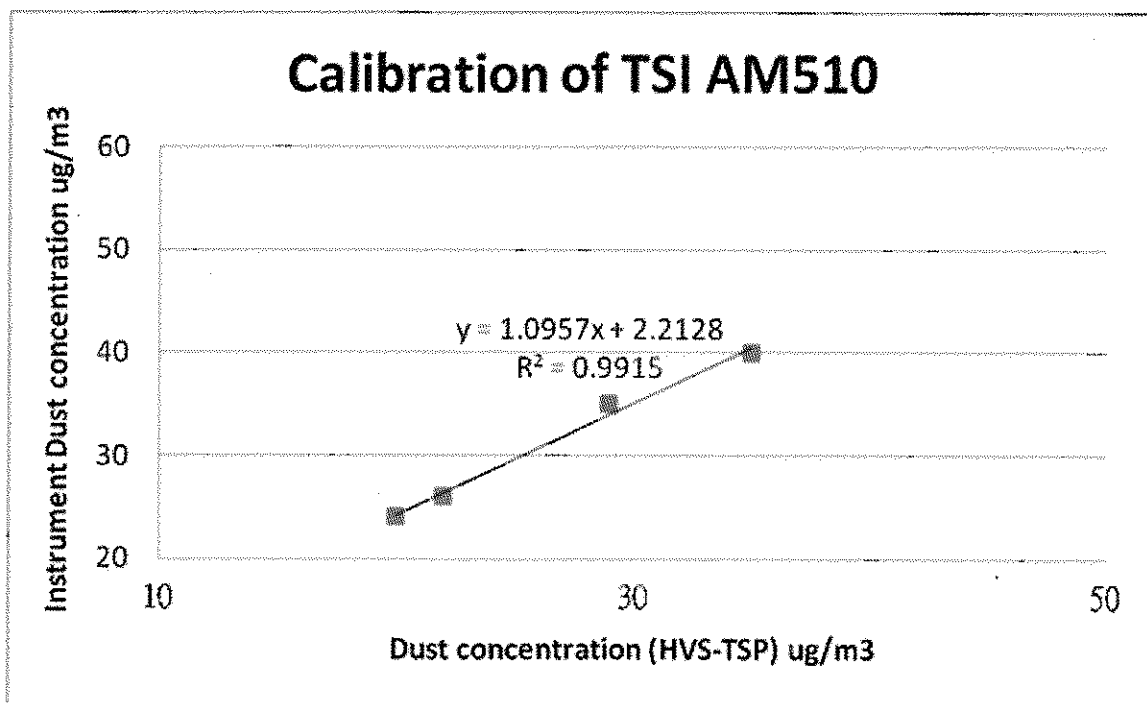
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豐盛創建成員 Member of FSE Holdings

Brand Name: TSI  
Model No.: AM510  
Serial No.: 11510004  
HVS No.: TE-5028A  
HVS Calibration Kit No.: TISCH 2137  
Date of Calibration: 13/10/2015  
Date of next Calibration: 12/10/2016

#### Calibration Record

HVS - TSP	20	22	29	35
TSI AM510	24	26	35	40



Mr. Ip Wing Hong, John  
Manager





# CERTIFICATE OF CALIBRATION AND TESTING

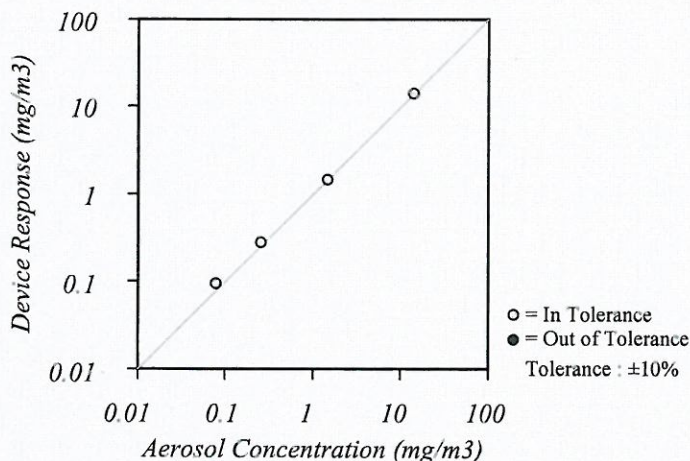
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510005
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left  
☐ As Found

☒ In Tolerance  
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E003433	09-09-15	03-09-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16
Temp/Humidity	E005409	04-16-15	04-16-16
Pressure	E003440	08-04-15	08-04-16

Measurement Variable	System ID	Last Cal.	Cal. Due
Flowmeter	E002371	03-02-15	03-02-16
Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005410	04-17-15	04-17-16

*Handwritten Signature*  
Calibrated

☒ Final Function  
Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

## **REPORT OF EQUIPMENT CALIBRATION**

---

### **INSTRUMENT DESCRIPTION**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument: TSP meter  
Brand Name: TSI  
Model No.: AM510  
Serial No.: 11510005  
Date of Issue: 27/10/2015  
Date of Calibration: 13/10/2015  
Date of Next Calibration: 12/10/2016

### **ISSUING ORGANISATION**

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre  
20 Lee Chung Street  
Chai Wan, Hong Kong

Phone: 852 - 2556 9172  
Fax: 852 - 2856 2010

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Mr. Ip Wing Hong, John  
Manager





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ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

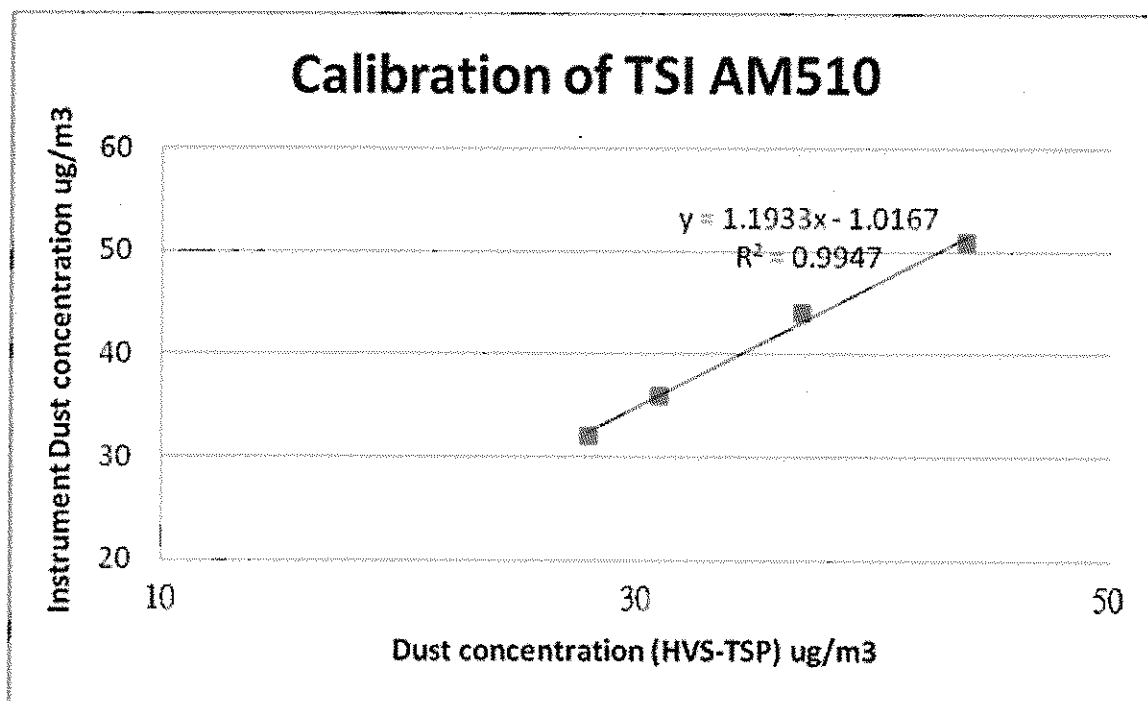
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豐盛創建成員 Member of FSE Holdings

Brand Name: TSI  
Model No.: AM510  
Serial No.: 11510005  
HVS No.: TE-5028A  
HVS Calibration Kit No.: TISCH 2137  
Date of Calibration: 13/10/2015  
Date of next Calibration: 12/10/2016

#### Calibration Record

HVS - TSP	28	31	37	44
TSI AM510	32	36	44	51



Mr. Ip Wing Hong, John  
Manager

# FACTORY CALIBRATION DATA OF THE BSWA 806 No. 34461

with preamplifier SVANTEK type SV18 No. 47248

## 1. LINEARITY TEST\* (electrical)

LEVEL METER function; Range: Low; Characteristic: A;  $f_{\sin} = 31.5$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	83.0
Error [dB]	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{\sin} = 1000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	123.0
Error [dB]	0.1	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A;  $f_{\sin} = 8000$  Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	122.0
Error [dB]	0.1	0.1	0.0	0.0	-0.0	-0.1	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{\sin} = 31.5$  Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{\sin} = 1000$  Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.1	-0.0	0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A;  $f_{\sin} = 8000$  Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	-0.1	0.0	0.0	-0.0	-0.0

1/3 OCTAVE (1kHz); Range: Low;  $f_{\sin} = 1000$  Hz

Nominal result [dB]	25.0	30.0	40.0	60.0	80.0	100.0	120.0	123.0
Error [dB]	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

## 2. TONE BURST RESPONSE\*

LEVEL METER function; Characteristic: A;  $f_{\sin} = 4000$  Hz; Burst duration: 2s

Range: Low; Steady level nominal result = 120dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	120.1	120.0	119.1	117.5	115.3	111.8	108.9	106.0	102.1	99.0	96.0	93.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	118.0	116.0	112.6	109.8	106.9	103.0	100.0	97.0	93.0	-	-	-
		Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	120.1	117.1	113.1	110.1	107.1	103.1	100.1	97.1	93.1	90.0	87.0	84.0
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Range: Low; Steady level nominal result = 60dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5
MAX	Fast	Indication [dB]	60.1	60.0	59.1	57.5	55.2	51.8	48.9	46.0	42.1	39.0	36.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.1
	Slow	Indication [dB]	58.0	56.0	52.6	49.8	46.9	43.0	40.0	37.0	33.0	-	-
		Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-
SEL	-	Indication [dB]	60.1	57.1	53.1	50.1	47.1	43.1	40.1	37.1	33.1	30.1	27.1
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	0.0

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	35.1	35.0	34.1
		Error [dB]	0.0	0.0	0.0
	Slow	Indication [dB]	33.1	31.0	27.6
		Error [dB]	-0.0	0.0	-0.1
SEL	-	Indication [dB]	35.1	32.1	28.2
		Error [dB]	0.0	0.0	0.1

Range: High; Steady level nominal result = 134dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	134.1	134.0	133.1	131.5	129.3	125.8	122.9	120.0	116.1	113.0	110.0	107.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	132.0	129.9	126.6	123.8	120.9	116.9	114.0	111.0	107.0	-	-	-
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	134.1	131.1	127.1	124.1	121.1	117.1	114.1	111.1	107.1	104.0	101.0	98.0
		Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1

Range: High; Steady level nominal result = 54dB

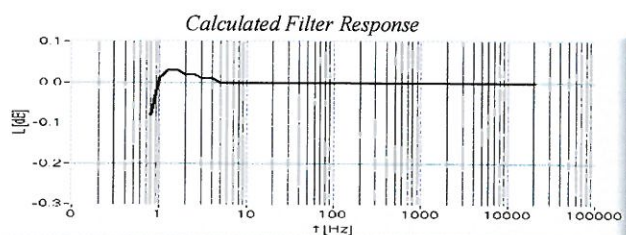
Result	Detector	Duration [ms]	1000	500	200	100	50
MAX	Fast	Indication [dB]	54.0	54.0	53.1	51.4	49.2
		Error [dB]	-0.0	0.0	0.0	-0.0	-0.0
	Slow	Indication [dB]	52.0	49.9	46.5	43.7	40.8
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1
SEL	-	Indication [dB]	54.0	51.0	47.1	44.1	41.1
		Error [dB]	-0.0	-0.0	0.0	0.0	0.0

Range: High; Steady level nominal result = 45dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	45.1	45.0	44.2
		Error [dB]	0.0	0.0	0.1
	Slow	Indication [dB]	43.1	41.0	37.6
		Error [dB]	-0.1	-0.0	-0.1
SEL	-	Indication [dB]	45.1	42.1	38.2
		Error [dB]	-0.0	-0.0	0.1

### 3. FREQUENCY RESPONSE\* (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal =120 dB;



Measured Filter Response with Preamplifier SV18  
(f-frequency, L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	0.0	4000	-0.0
12.5	0.0	125	0.0	8000	-0.0
16	0.0	250	0.0	16000	-0.0
20	0.0	500	0.0	20000	-0.0
25	0.0	1000	0.0		
31.5	0.0	2000	-0.0		

All frequencies are nominal center values for the 1/3 octave bands

### 4. INTERNAL NOISE LEVEL\* (electrical - compensated)

LEVEL METER function; Range: Low; (Back-light – off) ; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤20	≤12	≤12

\* measured with preamplifier SVANTEK type SV18 No. 47248.

### ENVIRONMENTAL CONDITIONS


Temperature	Relative humidity	Ambient pressure
25 °C	22%	1005 hPa

### TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	15900	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV30A	24563	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)

### CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: 

Test date: 2015-10-20



TEST REPORT  
for  
SOUND CALIBRATOR

Model : NC - 7 4

Serial No. : 34857296

Condition : Temperature 25 °C

Humidity 64 %RH

Date : September, 8, 2015

Signature : Y. Kitajima

1. Sound Pressure Level	94.0 ± 0.25 dB	<u>94.00 dB</u>
2. Frequency	1000 ± 7 Hz	<u>1002.0 Hz</u>
3. Distortion	3 % or less	<u>Pass</u>
4. Alarm Function		<u>Pass</u>
5. Appearance		<u>Pass</u>

Applicable standards

JIS C 1515:2004 class1

IEC 60942:2003 class1

## **Appendix C**

### Monitoring Results and Graphical plots

1-hr TSP Monitoring Result for AM1

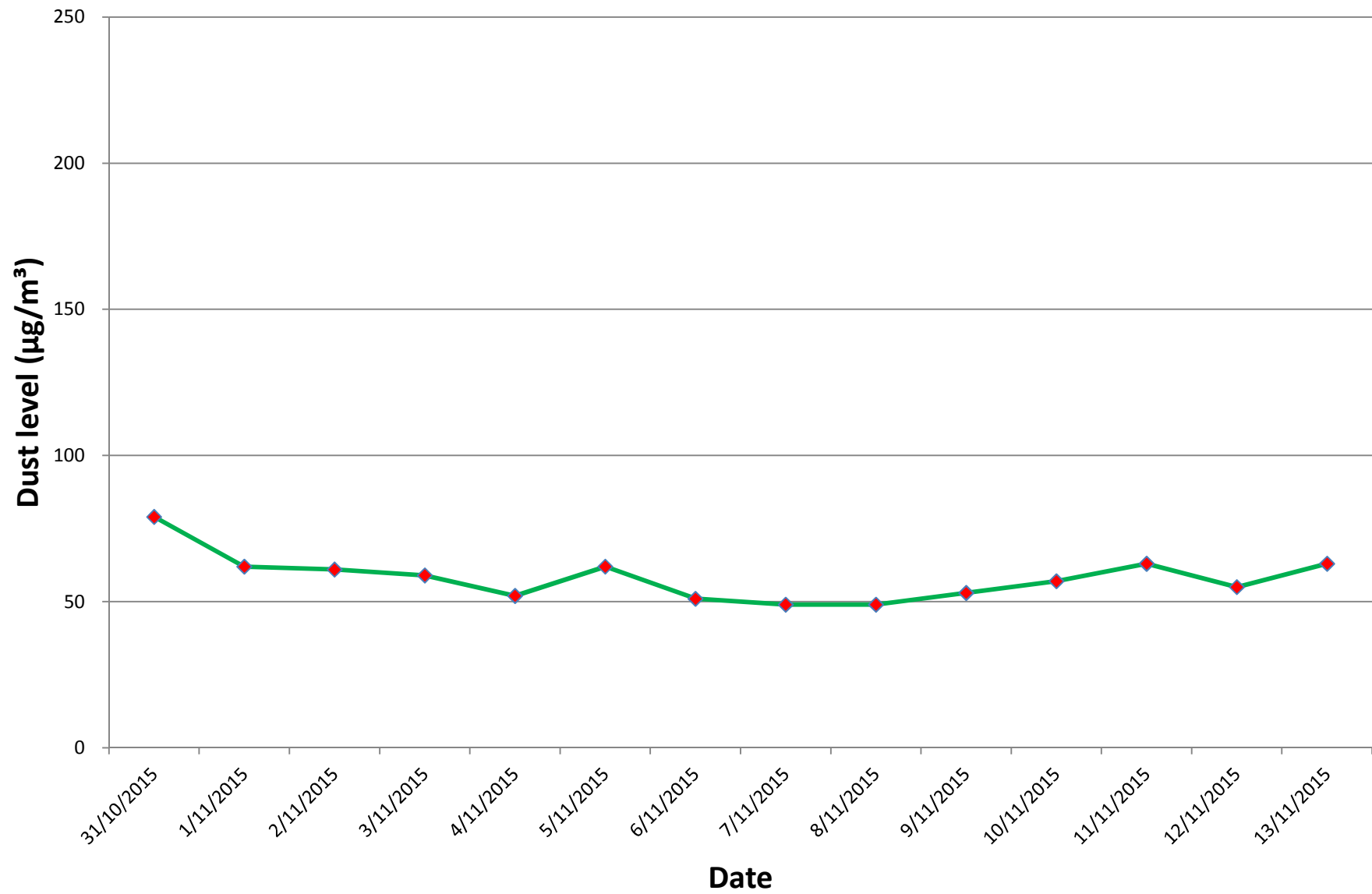
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	27.2	27.2	27.2	24.5	24.5	24.5	25.4	25.4	25.4	25.0	25.0	25.0	24.2	24.2	24.2
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	80	80	78	65	62	60	63	60	60	70	69	39	73	41	43
Average Concentration (µg/m³)	79			62			61			59			52		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	27.8	27.8	27.8	25.2	25.2	25.2	27.5	27.5	27.5	27.9	27.9	27.9	26.4	26.4	26.4
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	58	61	68	40	45	68	50	50	48	50	50	48	51	52	55
Average Concentration (µg/m³)	62			51			49			49			53		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	9:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	24.4	24.4	24.4	23.8	23.8	23.8	24.1	24.1	24.1	24.2	24.2	24.2
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	68	52	50	64	64	60	62	54	49	64	65	60
Average Concentration (µg/m³)	57			63			55			63		

\*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

**AM1 - 1h TSP Graph plot**



1-hr TSP Monitoring Result for AM2

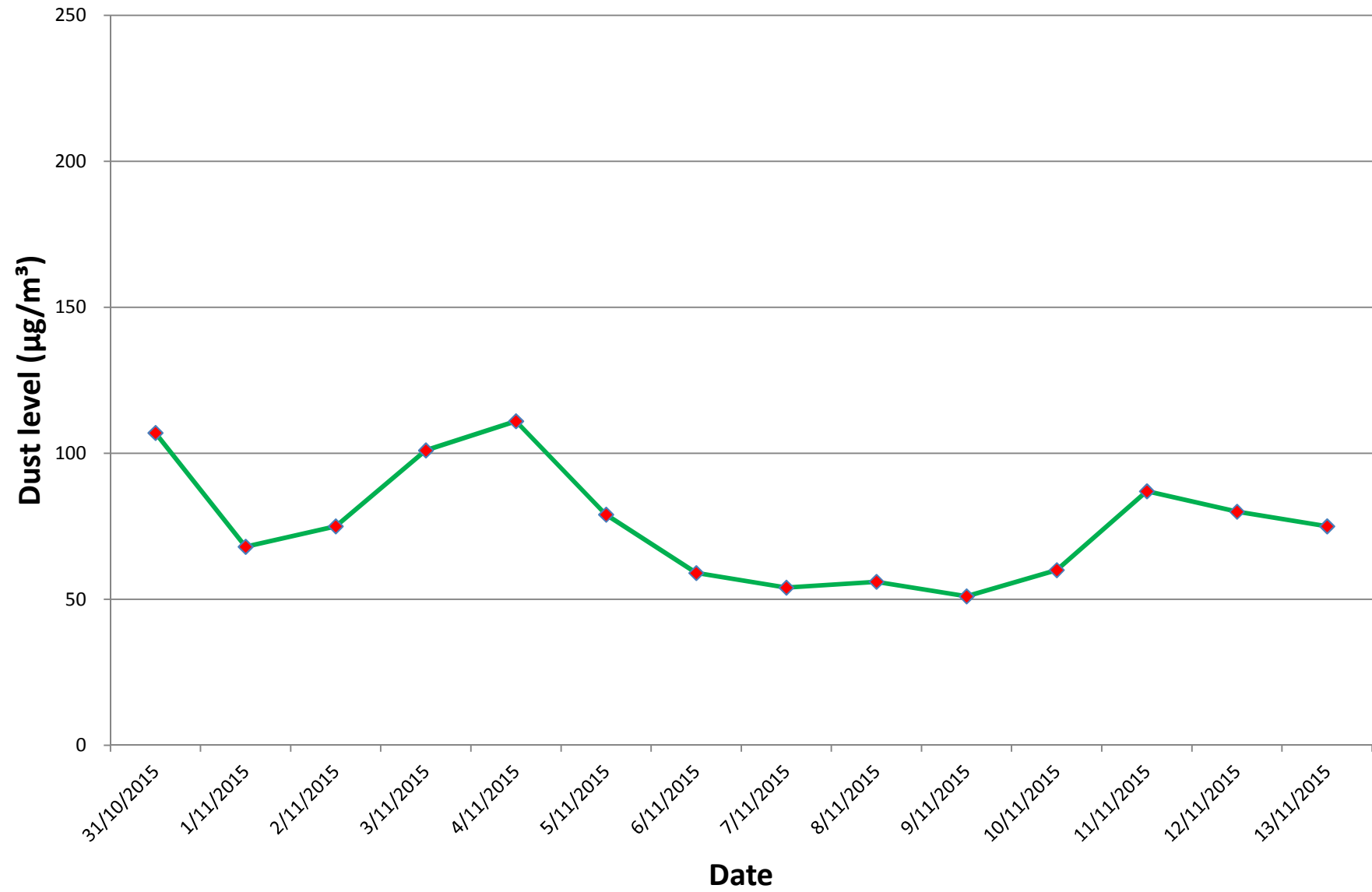
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	103	112	106	66	63	74	59	79	88	102	98	104	148	94	91
Average Concentration (µg/m³)	107			68			75			101			111		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	78	81	79	49	62	67	56	55	50	56	59	54	49	53	50
Average Concentration (µg/m³)	79			59			54			56			51		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	68	54	58	86	84	90	80	82	77	76	75	75
Average Concentration (µg/m³)	60			87			80			75		

\*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

**AM2 - 1h TSP Graph plot**



1-hr TSP Monitoring Result for AM3

Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	100	110	105	69	75	72	104	100	101	101	102	109	145	74	76
Average Concentration (µg/m³)	105			72			102			104			98		

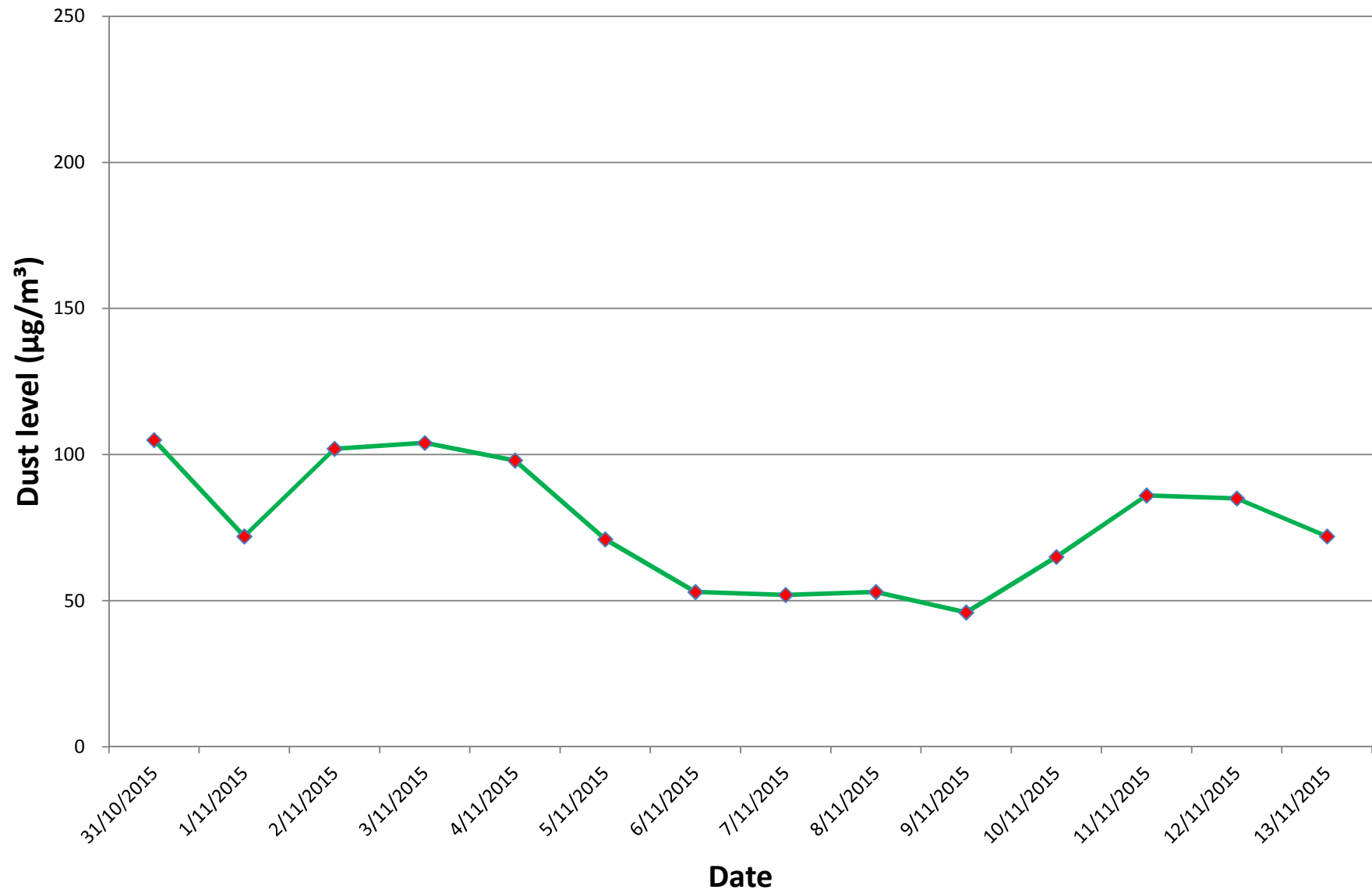
Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	70	70	73	53	57	50	56	52	49	53	55	51	49	47	41
Average Concentration (µg/m³)	71			53			52			53			46		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	74	58	62	91	82	84	88	82	85	76	70	71
Average Concentration (µg/m³)	65			86			85			72		

\*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO



**AM3 - 1h TSP Graph plot**



1-hr TSP Monitoring Result for AM4

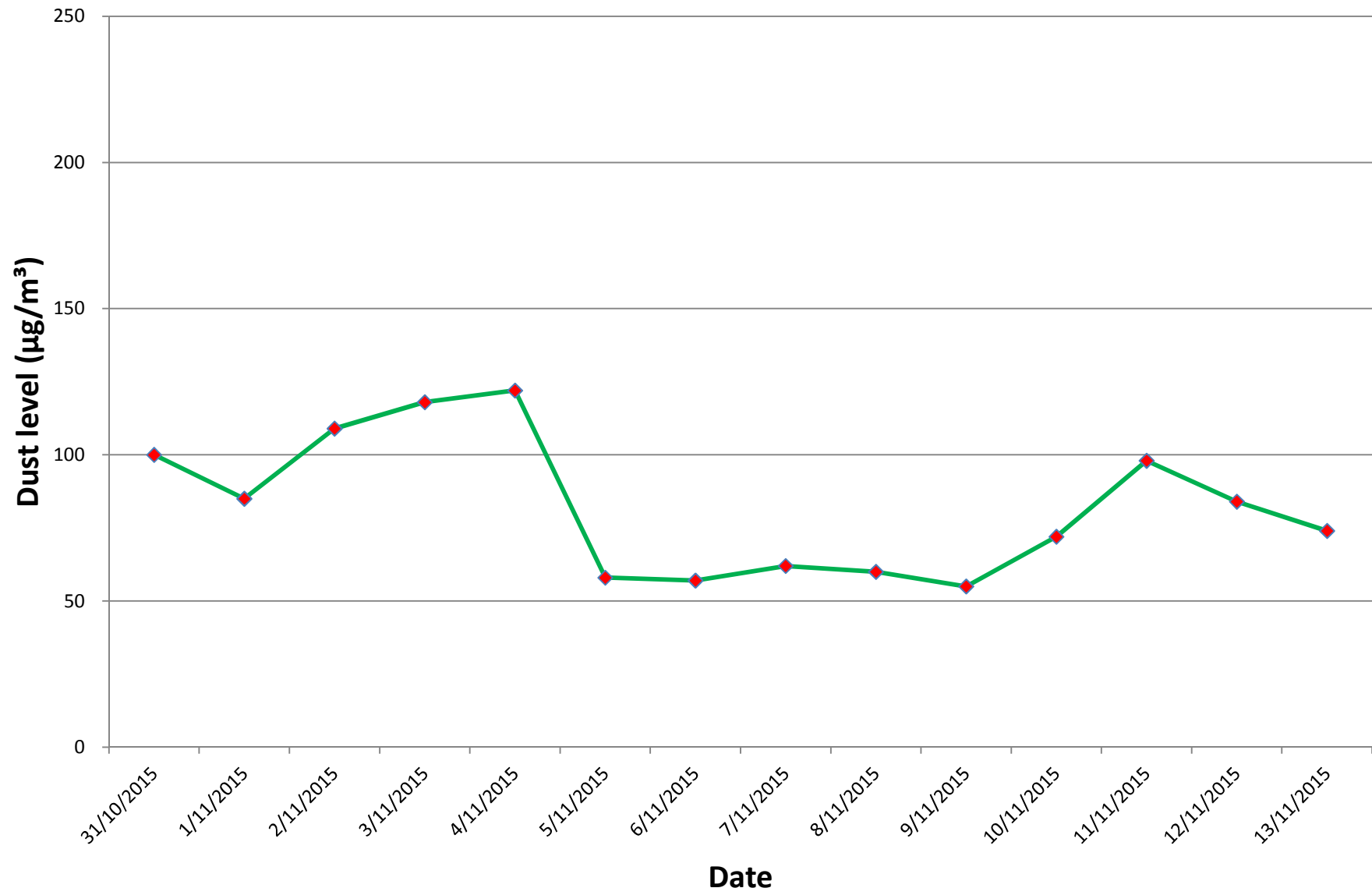
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	102	102	96	90	75	89	107	112	108	117	118	118	169	107	89
Average Concentration (µg/m³)	100			85			109			118			122		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	60	56	57	56	57	59	60	60	66	61	62	58	56	55	53
Average Concentration (µg/m³)	58			57			62			60			55		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	66	81	70	101	95	97	85	86	81	74	77	70
Average Concentration (µg/m³)	72			98			84			74		

\*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

**AM4 - 1h TSP Graph plot**

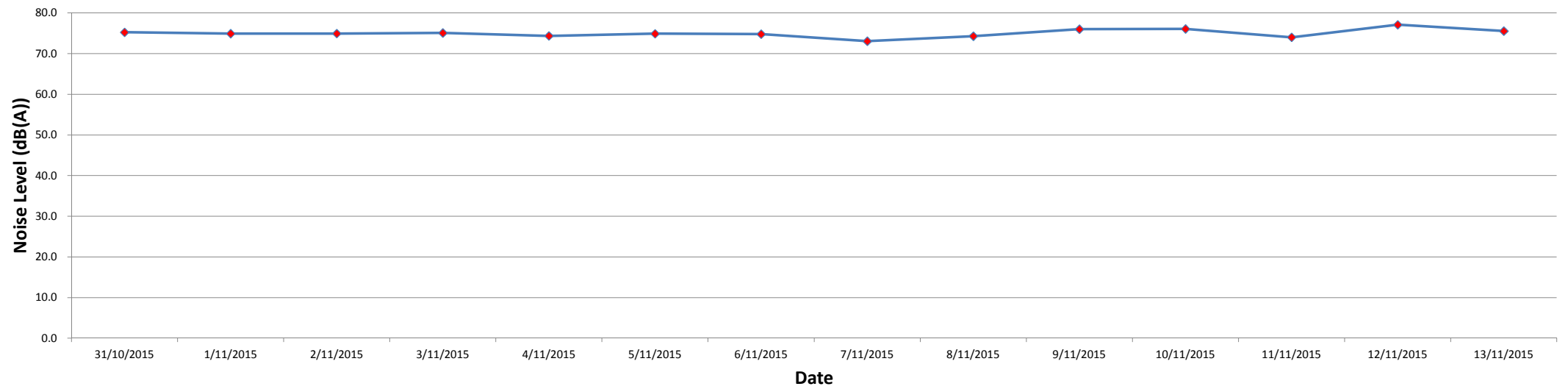


Noise Monitoring Result for NM1

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:00	14:00	14:00	14:00	9:00	14:00	9:00
Leq30min (dB(A))	75.2	74.9	75.0	75.1	74.4	74.9	74.8
L10 (dB(A))	79.2	77.4	78.0	78.5	77.4	77.2	77.4
L90 (dB(A))	69.9	71.7	70.0	69.1	69.3	71.5	69.6

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	14:00	14:00	9:00	9:00	14:00	14:00	9:00
Leq30min (dB(A))	73.1	74.3	76.0	76.1	74.0	77.1	75.5
L10 (dB(A))	75.8	76.7	78.7	79.0	77.3	80.3	78.8
L90 (dB(A))	69.0	70.8	71.9	72.0	68.6	72.8	71.4

NM1 - Leq (30min) Graph plot

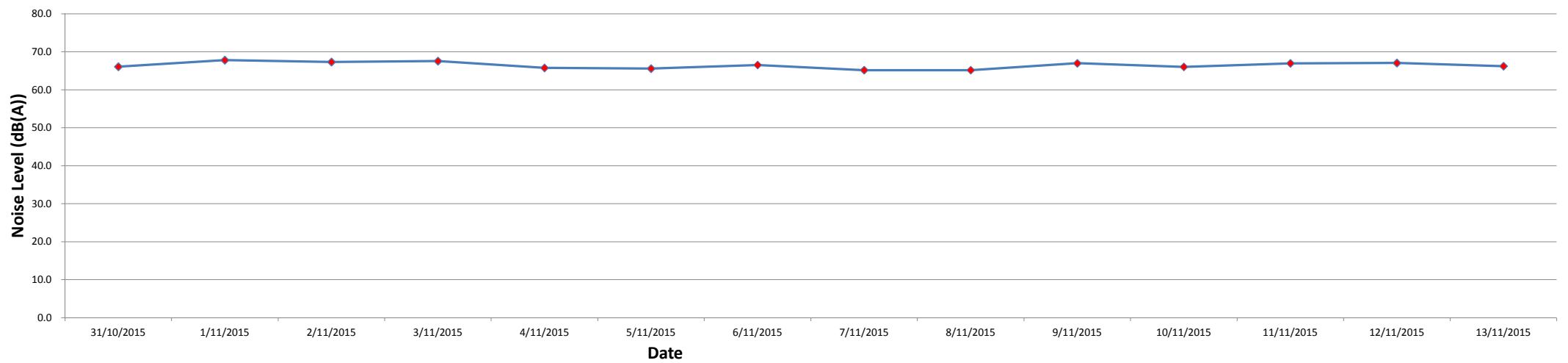


Noise Monitoring Result for NM2

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	17:30	16:30	16:30	16:30	11:30	16:30	11:30
Leq30min (dB(A))	66.1	67.8	67.3	67.6	65.8	65.6	66.5
L10 (dB(A))	69.3	70.2	69.8	70.3	68.1	68.6	70.4
L90 (dB(A))	62.3	63.4	62.1	63.7	62.5	59.1	63.5

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:30	16:30	11:30	11:30	16:30	16:30	11:30
Leq30min (dB(A))	65.2	65.2	67.0	66.0	67.0	67.1	66.2
L10 (dB(A))	67.7	67.7	70.7	70.0	69.7	69.6	71.0
L90 (dB(A))	62.1	61.9	61.5	61.5	63.3	63.8	61.6

NM2 - Leq (30min) Graph plot

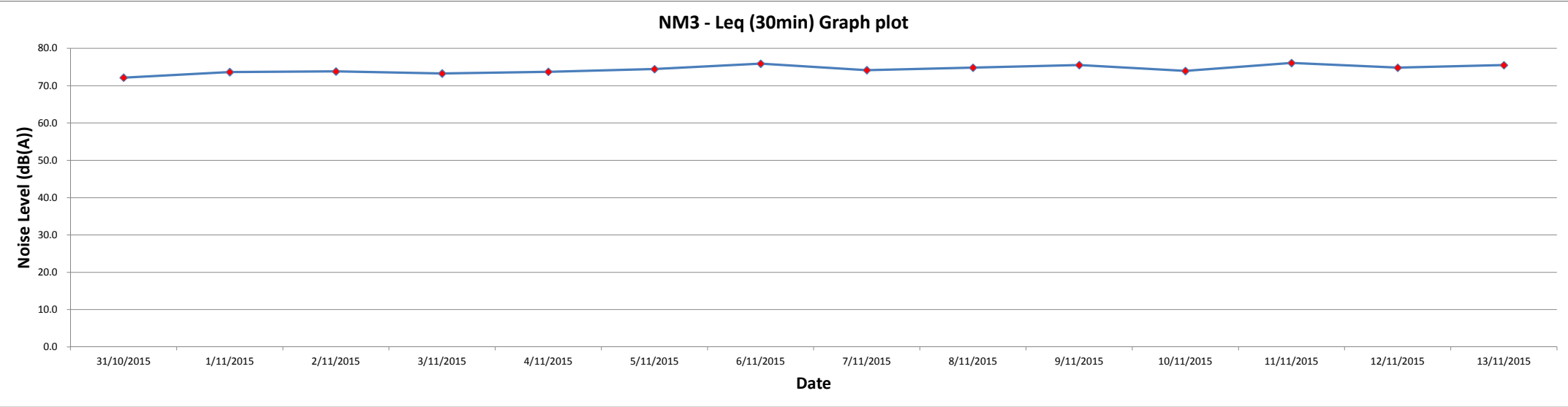


Noise Monitoring Result for NM3

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:30	14:30	14:30	14:30	9:30	14:30	9:30
Leq30min (dB(A))	72.2	73.6	73.8	73.3	73.7	74.4	75.9
L10 (dB(A))	75.6	76.8	76.9	76.6	76.9	77.5	78.4
L90 (dB(A))	67.1	68.4	69.5	66.7	68.8	70.8	72.4

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	14:30	14:30	9:30	9:30	14:30	14:30	9:30
Leq30min (dB(A))	74.2	74.8	75.5	74.0	76.1	74.8	75.5
L10 (dB(A))	77.0	77.7	78.1	76.4	79.0	77.7	77.6
L90 (dB(A))	69.9	71.7	71.2	69.9	72.0	70.9	72.1



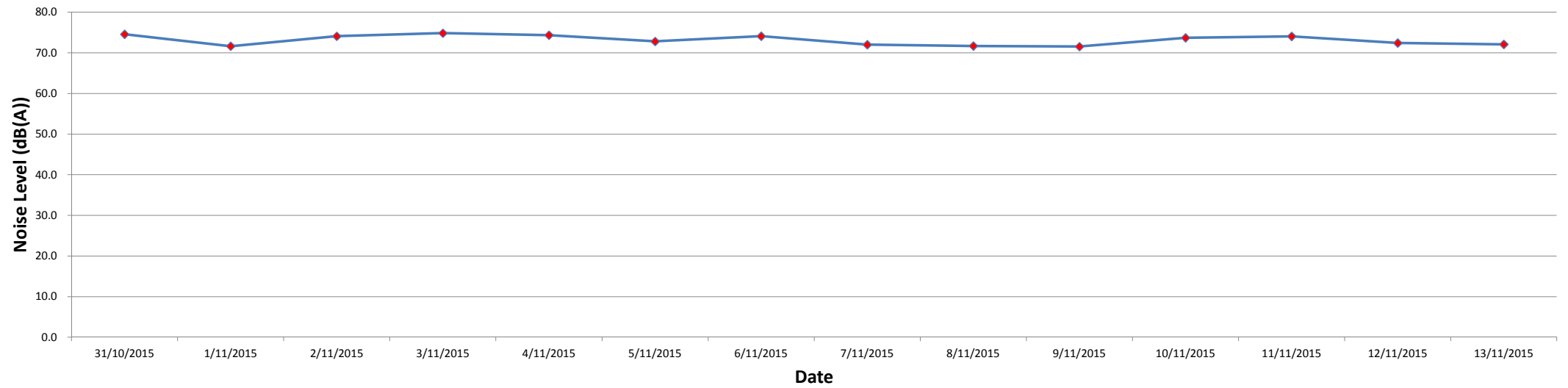


Noise Monitoring Result for NM4

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:15	15:15	15:15	15:15	10:15	15:15	10:15
Leq30min (dB(A))	74.6	71.7	74.1	74.8	74.4	72.8	74.1
L10 (dB(A))	77.2	74.5	77.1	78.0	78.1	75.5	77.3
L90 (dB(A))	69.6	67.0	67.1	69.3	67.7	67.7	68.3

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:15	15:15	10:15	10:15	15:15	15:15	10:15
Leq30min (dB(A))	72.0	71.7	71.5	73.7	74.1	72.4	72.1
L10 (dB(A))	75.5	74.6	74.3	76.7	77.1	75.5	75.0
L90 (dB(A))	66.9	67.3	67.0	69.0	68.7	67.7	67.3

NM4 - Leq (30min) Graph plot



Noise Monitoring Result for NM5

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:50	15:50	15:50	15:50	10:50	15:50	10:50
Leq30min (dB(A))	71.3	72.1	71.0	72.5	71.3	71.8	71.2
L10 (dB(A))	74.4	75.0	74.1	75.1	73.5	75.4	74.2
L90 (dB(A))	65.9	68.4	66.3	68.1	68.3	66.3	66.6

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:50	15:50	10:50	10:50	15:50	15:50	10:50
Leq30min (dB(A))	71.6	70.8	71.1	71.5	71.5	72.7	73.7
L10 (dB(A))	74.4	72.6	74.0	73.8	74.7	75.8	76.7
L90 (dB(A))	67.7	68.0	67.7	68.5	67.0	68.0	68.3

NM4 - Leq (30min) Graph plot

