

Development at West Kowloon Cultural District

**Monthly Environmental Monitoring and Audit (EM&A) Report
for May 2021**

09 June 2021

In accordance with the Environmental Permit, Condition 3.4, this Monthly EM&A Report has been certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC) as complying with the requirements as set out in Sections 1, 10, 11, 12 and 13 of the EM&A Manual.

Certified by:



CK Wu
Environmental Team Leader (ETL)
West Kowloon Cultural District Authority

Date

11 June 2021

Verified by:



Claudine Lee
Independent Environmental Checker (IEC)
Meinhardt Infrastructure & Environment Ltd

Date

11 June 2021

This Report Consists of :

Part-1: EM&A at Lyric Theatre Complex

and

**Part-2: EM&A for Foundation, Excavation
and Lateral Works for Integrated
Basement and Underground Road
in Zone 2A**

Part-1: EM&A at Lyric Theatre Complex



Lyric Theatre Complex

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Executive summary

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021, and the construction works and EM&A programme for Lyric Theatre Complex was commenced on 1 March 2016.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at Lyric Theatre Complex (L1 and L2 Contract) from 1 May to 31 May 2021.

Exceedance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Noise in this reporting month.

Implementation of Mitigation Measures

Construction phase weekly site inspections were carried out on 5, 12, 20 and 26 May 2021 for Lyric Theatre Complex (L1 and L2 Contract) to confirm the implementation measures undertaken by the Contractors in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the abovementioned weekly site inspections during the reporting month. No adverse comment on landscape and visual aspects was made during these inspections.

Record of Complaints

Three environmental complaints were recorded in the reporting month.

Record of Notifications of Summons and Successful Prosecutions

No notifications of summons and successful prosecutions were recorded in the reporting month.

Future Key Issues

Slab construction

The major site works for L1 scheduled to be commissioned in the coming month include:

- Box culvert construction
- AET protection – Construction of at-grade Slab
- Construction of dog house
- Column installation
- Austin Road West lay-by (PIW Works)

The major site works for L2 scheduled to be commissioned in the coming month include:

- LTC construction
 - Structure (Slab, wall, columns and beam)
 - Falsework and formwork erection
 - Reinforcement work
 - Concrete work
 - ABWF & MEP work
- ASDA and Lyric Theatre Promenade
 - Structure and BS works
- DSC cofferdam (Cofferdam A)
 - Install DCS pipes/ valve/ fittings (DN500/ DN1400) outside chamber Construction of Valve Chamber
 - Install new connection puddle flange
 - Pipe leakage tests (pre-test)
 - Construction of valve chamber (middle portion)
- Modification to existing pump cell
 - ABWF works
- Extended basement
 - ABWF & MEP work
 - RC Duct work
- Underpass and Associated Area
 - RC Structure (Waffle Ceiling)
- M+ Day 2 Works
 - Hoarding Work
 - Modification Works at M+Day 2 PN2

Potential environmental impacts due to the construction activities, including air, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

1 Introduction

1.1 Background

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021, and the construction works and EM&A programme for Lyric Theatre Complex was commenced on 1 March 2016.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary also falls under this same category.

The M+ Museum development aims to provide an iconic presence for the M+ Museum, semi-transparent vertical plane, housing education facilities, a public restaurant and museum offices. At ground and lower levels, generous access will be provided to the park and other West Kowloon Cultural District facilities, alongside a public resource centre, theatres, retail and dining, and back-of-house functions.

The 1,200-seat Lyric Theatre Complex will be Hong Kong's first world-class facility for dance performances, including ballet, contemporary and Chinese dance forms. In the run up to the opening of further major performing arts venues in the WKCD, it will also be used for a wide variety of performing arts events including drama, opera and musical performances. The Lyric Theatre Complex will act as a platform for Hong Kong's leading arts organisations and be a new major venue to show programmes from Asia and worldwide.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at Lyric Theatre Complex (L1 and L2 Contract) from 1 May to 31 May 2021. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

1.3 Status of Construction Works in the Reporting Period

During the reporting period, construction works at L1 undertaken include:

- Slab construction
- Box culvert construction
- AET protection – Construction of at-grade Slab
- Construction of dog house
- Column installation
- Austin Road West lay-by (PIW Works)

During the reporting period, construction works at L2 undertaken include:

- LTC construction
 - Structure (Slab, wall, columns and beam)
 - Falsework and formwork erection
 - Reinforcement work
 - Concrete work
 - ABWF & MEP work
- ASDA and Lyric Theatre Promenade
 - Structure and BS works
- DSC cofferdam (Cofferdam A)
 - Install DCS pipes/ valve/ fittings (DN500/ DN1400) outside chamber Construction of Valve Chamber
 - Install new connection puddle flange
 - Pipe leakage tests (pre-test)
- Modification to existing pump cell
 - ABWF works
- Extended basement
 - ABWF & MEP work
 - RC Duct work
- Underpass and Associated Area
 - RC Structure (Waffle Ceiling)
- M+ Day 2 Works
 - Hoarding Work

The Construction Works Programme of Lyric Theatre Complex (L1 and L2 Contract) is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1**. Please refer to **Table 4.3** and **Table 4.4** on the status of the environmental licenses.

1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

1.4.1 EM&A Requirements

A summary of impact EM&A requirements is presented in **Table 1.1**.

Table 1.1: Summary of Impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies
Air Quality	24-Hour TSP	AM1 - International Commerce Centre	At least once every 6 days
	1-Hour TSP	AM1 - International Commerce Centre	At least 3 times every 6 days
	24-Hour TSP	AM2 - The Harbourside Tower 1	At least once every 6 days
	1-Hour TSP	AM2 - The Harbourside Tower 1	At least 3 times every 6 days
Noise	Leq, 30 minutes	NM1- The Harbourside Tower 1	Weekly
Landscape & Visual	Monitor implementation of proposed mitigation measures during the construction stage	As described in Table 9.1 and 9.2 of the EM&A Manual	Bi-weekly

1.4.2 Alternative Monitoring Locations

In the context of the monitoring activities at M+ Museum and the Lyric Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring. Other monitoring locations (i.e. AM3 to AM5 and NM2 to NM5) were so far away from M+ Museum and the Lyric Complex and could not be representative for impact monitoring.

The Harbourside management office formally rejected our proposal of setting up air quality and noise monitoring equipment on its premises at the podium level of Tower 1 (AM2/NM1) on 10 November 2015. Nevertheless, suitable air quality monitoring location at AM2 was identified on the ground floor in front of The Harbourside Tower 1, which is at the same location as that of baseline monitoring for consistency. No management approval is required at the ground floor for conducting the air monitoring. However, the electricity supply at AM2 was suspended from 31 August 2016 and was no longer available. In order to have a more secure electricity supply, an alternative air monitoring location (AM2A) was identified at Austin Road West opposite to The Harbourside Tower 1, which is close to Lyric Theatre Complex site entrance. This alternative air monitoring location was approved by EPD on 28 September 2016. Due to works programme, the air monitoring location AM2A has been relocated to the alternative monitoring location AM2B at the 1st floor of Gammon's site office, which was approved by EPD on 21 February 2019.

Alternative noise monitoring location was identified at The Arch (NM2); however, The Arch management office formally rejected our proposal of setting up noise monitoring equipment on its premises on 23 November 2015. On the other hand, noise monitoring at G/F of Harbourside could not be representative. However, approval from the management office of the International Commerce Centre has been granted on 29 February 2016 for conducting noise monitoring at the alternative noise monitoring location identified at the podium floor (NM1A) which is free from screening to the construction activities.

In short, 2 air quality monitoring stations and 1 noise impact monitoring station were confirmed for the impact monitoring.

The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

2 Impact Monitoring Methodology

2.1 Introduction

For air quality and noise, the monitoring methodology, including the monitoring locations, monitoring equipment used, monitoring parameters, and frequency and duration etc., for air quality and noise are detailed in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in **Appendix E**.

For landscape and audit impact, the relevant EM&A monitoring requirements and details are also presented in this Section.

2.2 Air Quality

2.2.1 Monitoring Parameters, Frequency and Duration

Table 2.1 summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Frequency	Duration
24-hour TSP	At least once in every six-days	24 hours
1-hour TSP	At least 3 times every six-days	60 minutes

2.2.2 Monitoring Locations

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring stations AM1 and AM2B were set up at the proposed locations in accordance with updated EM&A Manual. Location of the monitoring station is given in **Table 2.2** and shown in **Figure 1**.

Table 2.2: Air Quality Monitoring Station

Monitoring Station	Location
AM1	International Commerce Centre (ICC)
AM2B	1st Floor of Gammon's Site Office

2.2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: TE-5170) located at the designated monitoring station. The HVS meets all the requirements stated in of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS, calibration kit and portable dust meters are attached in **Appendix F**.

Table 2.3: TSP Monitoring Equipment

Equipment	Model
24-hour TSP monitoring	
High Volume Sampler	TE-5170 (Serial No.: 0767 and 8919)
Calibrator	TE-5025A (Orifice I.D.: 2454)
1-hour TSP monitoring	
Portable direct reading dust meter	Sibata LD-3B (Serial No.: 245833 and 276015)

Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The 1-hour TSP monitoring should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

2.2.4 Monitoring Methodology

24-hour TSP Monitoring

Installation

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

Preparation of Filter Papers

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 µm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

Field Monitoring Procedures

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 m³/min. The range specified in the EM&A Manual was between 0.6-1.7 m³/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.
- Calibration records for HVS and calibration kit are shown in **Appendix F**.

1-hour TSP Monitoring

Field Monitoring

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push "START/STOP" to start the 1-hour TSP measurement.

- Regular checking of the time period setting to ensure monitoring time of 1 hour.

Maintenance and Calibration

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

2.3 Noise

2.3.1 Monitoring Parameters, Frequency and Duration

Table 2.4 summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels L_{eq} , L_{10} and L_{90} are recorded in a 30-minute interval between 0700 and 1900 hours.

Table 2.4: Noise Monitoring Parameters, Period and Frequency

Time Period	Parameters	Frequency
Daytime on normal weekdays (0700-1900 hours)	L_{eq} (30 min), L_{90} (30 min) & L_{10} (30 min)	Once every week

2.3.2 Monitoring Location

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring station NM1A was set up at the proposed location in accordance with updated EM&A Manual. Location of the monitoring station is given in **Table 2.5** and shown in **Figure 1**.

Table 2.5: Noise Monitoring Station

Monitoring Station	Location
NM1A	International Commerce Centre (ICC)

2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{Aeq}) and percentile sound pressure level (L_x). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

Table 2.6: Noise Monitoring Equipment

Monitoring Station	Equipment Model	
	Integrating Sound Level Meter	Calibrator
NM1A	Rion NL-52 (Serial No. 01010406)	LARSON DAVIS CAL200 (Serial No.11334)

2.3.4 Monitoring Methodology

Field Monitoring

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at the monitoring locations.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting: A
 - time weighting: Fast
 - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

2.4 Landscape and Visual

2.4.1 Monitoring Program

Table 2.7 details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase

Stage	Monitoring Task	Frequency	Report	Approval
Construction	Monitor implementation of proposed mitigation measures during the construction stage.	Bi-weekly	ET to report on Contractor's compliance	Counter-signed by IEC

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.

3 Monitoring Results

3.1 Impact Monitoring

Construction impact monitoring for air quality, noise and landscape and visual impact was undertaken in compliance with the EM&A Manual during the reporting month.

3.2 Air Quality Monitoring

3.2.1 1-hour TSP

Results of 1-hour TSP at the monitoring location AM1 and AM2B are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

Table 3.1: Summary of 1-hour TSP monitoring results

Monitoring Station	Monitoring Date	Start Time	1-hour TSP ($\mu\text{g}/\text{m}^3$)			Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1st Result	2nd Result	3rd Result			
AM1	04-May-21	8:32	54	62	70	17-70	273.7	500
	10-May-21	8:22	31	28	37			
	14-May-21	8:32	51	48	42			
	20-May-21	8:20	19	17	20			
	26-May-21	8:32	36	40	47			
AM2B	04-May-21	8:52	63	71	70	27-71	274.2	500
	10-May-21	8:43	48	42	55			
	14-May-21	8:52	67	55	56			
	20-May-21	8:42	34	29	27			
	26-May-21	8:48	61	67	58			

3.2.2 24-hour TSP

Results of 24-hour TSP at the monitoring location AM1 and AM2B are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

Table 3.2: Summary of 24-hour TSP monitoring results

Monitoring Station	Monitoring Date	Start Time	Monitoring Results ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM1	04-May-21	08:30	46	15-46	143.6	260
	10-May-21	08:20	23			
	14-May-21	08:30	42			
	20-May-21	08:18	15			
	26-May-21	08:30	19			
AM2B	04-May-21	08:46	120	20-120	151.1	260
	10-May-21	08:36	63			
	14-May-21	08:46	43			
	20-May-21	08:36	20			

Monitoring Station	Monitoring Date	Start Time	Monitoring Results ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
	26-May-21	08:46	47			

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

3.3 Noise Monitoring

The construction noise monitoring results at the monitoring location NM1A are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up of a free-field measurement are shown in **Appendix G**.

Table 3.3: Summary of noise monitoring results during normal weekdays

Monitoring Date	Start Time	End Time	L_{eq} (30 mins)*, dB(A)	Limit Level for L_{eq} (dB(A))
04-May-21	09:35	10:05	68	75
10-May-21	09:26	09:56	67	
20-May-21	09:25	09:55	67	
26-May-21	09:35	10:05	68	

Remarks:

* +3dB (A) correction was applied to free-field measurement.

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting month.

3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 5 and 20 May 2021 for Lyric Theatre Complex (L1 and L2 Contract) during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during these inspections.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

4 Site Environmental Management

4.1 Site Inspection

Construction phase weekly site inspections were carried out on 5, 12, 20 and 26 May 2021 at Lyric Theatre Complex (L1 and L2 Contract). The joint site inspection with IEC, ET, ER and Contractor was held on 20 May 2021. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.1** and **Table 4.2**. Error! Reference source not found..

Table 4.1: Summary of Site Inspections and Recommendations for L1

Inspection Date	Parameter	Observation / Recommendation	Contractor's Responses / Action(s) Undertaken	Close-out (Date)
28-Apr-21	Water Quality	Chemicals were observed without drip tray. The contractor was reminded to provide a suitable drip tray. (Location: B2-South)	The contractor has provided drip trays for the chemicals.	05-May-21
05-May-21	Water Quality	The contractor was reminded to ensure the wastewater treatment facilities are working properly.	The contractor has ensured the wastewater treatment facilities are working properly.	05-May-21
05-May-21	Noise Impact	The breaker was observed without noise insulating fabric. The contractor was reminded to provide noise insulating fabric for the breaker.	The contractor has provided noise insulating fabric for the breaker.	11-May-21
12-May-21	Air Quality	Idle stockpiles should be properly covered.	The stockpiles have been removed.	13-May-21
12-May-21	Air Quality	Cement bags shall be properly covered.	The contractor has covered the cement bags.	13-May-21
20-May-21	Air Quality	Dusty materials were observed without cover near the box culvert. The contractor was reminded to cover the dusty materials.	The contractor has properly covered the dusty materials.	26-May-21
20-May-21	Waste Management	The contractor was reminded to exercise proper separation of waste.	The contractor has exercised proper separation of waste and remove them regularly.	26-May-21
26-May-21	Air Quality	Cement bags shall be properly covered.	/	On-going
26-May-21	Air Quality	NRMM label is missing on the lifting platform, the contractor was reminded to affix a proper NRMM label for the lifting platform. (Location: B1-South)	/	On-going

Table 4.2: Summary of Site Inspections and Recommendations for L2

Inspection Date	Parameter	Observation / Recommendation	Contactors' Responses / Action(s) Undertaken	Close-out (Date)
05-May-21	Water Quality	The contractor was reminded to ensure the wastewater treatment facilities are working properly.	The contractor has ensured the wastewater treatment facilities are working properly.	05-May-21
05-May-21	Water Quality	Drip tray was observed with water inside, the contractor was reminded to clear the water in the drip tray regularly to prevent overflow.	The contractor has cleared the water inside the drip tray.	06-May-21
20-May-21	Air Quality	The contractor shall maintain high standard of housekeeping to avoid dust impact.	The contractor has ensured high standard of housekeeping.	24-May-21
20-May-21	Air Quality	Dry roads were observed. The contractor was reminded to increase water spraying frequency.	The contractor has increased water spraying frequency.	24-May-21
26-May-21	Waste Management	The contractor shall exercise proper storage of waste generated at site. (Location: G/F waste storage area)	The contractor has exercised proper storage of waste.	28-May-21

4.2 Advice on the Solid and Liquid Waste Management Status

The Contractors have been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Lyric Theatre Complex (L1 and L2 Contract) Contractors, 660.15 tonnes and 465.64 tonnes of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 Public Fill respectively in the reporting month, while 355.3 tonnes of general refuse were disposed of at SENT and WENT landfill. 0.0 tonne of metals, 0.0 tonne of paper/cardboard packaging, 0.1 tonnes of plastics and 0.0 tonne of timber were collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material was reused on site. 0.0 tonne of inert C&D materials was reused in other projects and 0.0 tonne of inert C&D material was imported for reuse at site. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.0 tonne of chemical waste was collected by licensed contractors in the reporting period.

The actual amounts of different types of waste generated by the activities of construction works at Lyric Theatre Complex in the reporting month are shown in **Appendix I**.

4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.3** and **Table 4.4**.

Table 4.3: Status of Environmental Submissions, Licenses and Permits for L1

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Chemical Waste Producer Registration				
WPN5213-217-G2347-39	17-Feb-16	--	Valid	--
Billing Account Construction Waste Disposal				
7029925	22-Jan-18	--	Account Active	--
Construction Noise Permit				
GW-RE0186-21	1-Mar-21	31-May-21	Valid	--
Wastewater Discharge License				
WT-00030694-2018	11-Apr-18	30-Apr-23	Valid	--
Notification under Air Pollution Control (Construction Dust) Regulation				
429708	16-Jan-18	--	Notified	--

Table 4.4: Status of Environmental Submissions, Licenses and Permits for L2

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Chemical Waste Producer Registration				
WPN5213-217-G2347-39	17-Feb-16	--	Valid	This license/ permit is share with L1
Billing Account Construction Waste Disposal				
7032787	02-Jan-19	--	Account Active	--
Construction Noise Permit				
GW-RE0186-21	1-Mar-21	31-May-21	Valid	This license/ permit is share with L1
Wastewater Discharge License				
WT-00030694-2018	11-Apr-18	30-Apr-23	Valid	This license/ permit is share with L1
Notification under Air Pollution Control (Construction Dust) Regulation				
448474	27-Aug-19	--	Notified	--

4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

L1**Air Quality**

- High standard of housekeeping shall be maintained to prevent emission of fugitive dust
- Any debris shall be covered entirely by impervious sheeting or stored in a debris collection area
- Proper NRMM label shall be affixed on all NRMMs operating on-site

Noise Impact

- Noise insulating fabric shall be adopted for certain PME

Water Quality

- Sand/Silt removal facilities shall be provided to remove sand/silt particles from runoff
- All drainage facilities shall be maintained to ensure proper and efficient operation at all times

Waste Management

- Segregation and storage of different types of waste in different containers shall be exercised to enhance reuse or recycling of materials and proper disposal

L2**Air Quality**

- High standard of housekeeping shall be maintained to prevent emission of fugitive dust
- Unpaved parts of the road shall be sprayed with water so as to keep the entire road surface wet

Water Quality

- All drainage facilities shall be maintained to ensure proper and efficient operation at all times
- Oil and fuels shall be stored in designated areas which have pollution prevention facilities

Waste Management

- All wastes generated at site shall be collected and disposed to an appropriate facility regularly

5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

Table 5.1: Status of Submissions under the Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for April 2021	14 May 2021

6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

6.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting month.

6.2 Record on Environmental Complaints Received

Three environmental complaints were received in the reporting month.

On 11 May 2021, West Kowloon Cultural District Authority (WKCD) has received a complaint from the office of Mr. Derek Hung (YTMD member). The resident of Harbourside found that noise was generated from nearby construction site on Sunday 9 May 2021. Based on the investigation, no noisy works were undertaken on 9 May 2021 (Sunday) on Lyric Theatre Complex (L1 & L2 Contracts) construction sites. Therefore, the complaint could not be attributable to the Lyric Theatre Complex. The probable noise source might be the road works conducted by other adjacent project. Hence, it was concluded that the complaint was not related to Lyric Theatre Complex. However, noise mitigation measures will continue to be strictly implemented on site to reduce impacts to nearby residents.

Also on 11 May 2021, WKCD has received a complaint from Environmental Protection Department (EPD). Referring to the pictures provided by the complainant, pollutant was spotted at the water body of Victoria Harbour near WKCD construction site between 7 May 2021 and 9 May 2021. Based on the site investigation, no large excavation work and earthwork were conducted on 7 and 8 May 2021. No construction works were undertaken on 9 May 2021. The daily self-checking on effluent quality showed that the wastewater treatment plants were well operated and the effluent was well treated. Also, from the complaint photo, the mud / dirt was out of Lyric Theatre Complex site boundary. Thereby, the complaint could not be attributable to Lyric Theatre Complex (L1 & L2 Contracts). However, the contractors are reminded to strictly maintain good site practices to avoid muddy water flowing into the waterbody of Victoria Harbour.

On 12 May 2021, WKCD has received a complaint from EPD. Referring to the picture provided by the complainant, pollutant was spotted at the water body of Victoria Harbour near WKCD construction site on 9 May 2021. Based on the site investigation, no muddy construction works were carried out on 9 May 2021 by the contractors. The daily self-checking on effluent quality showed that the wastewater treatment plants were well operated and the effluent was well treated. Also, from the complaint photo, the yellowish plume was observed out of Lyric Theatre Complex site. Thereby, the complaint could not be attributable to Lyric Theatre Complex (L1 & L2 Contracts). However, the contractors are reminded to strictly maintain good site practices to avoid muddy water flowing into to the water body of Victoria Harbour.

The cumulative statistics on complaints were provided in **Appendix K**.

6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

7 Future Key Issues

7.1 Construction Works for the Coming Month(s)

The major site works for L1 scheduled to be commissioned in the coming month include:

- Slab construction
- Box culvert construction
- AET protection – Construction of at-grade Slab
- Construction of dog house
- Column installation
- Austin Road West lay-by (PIW Works)

The major site works for L2 scheduled to be commissioned in the coming month include:

- LTC construction
 - Structure (Slab, wall, columns and beam)
 - Falsework and formwork erection
 - Reinforcement work
 - Concrete work
 - ABWF & MEP work
- ASDA and Lyric Theatre Promenade
 - Structure and BS works
- DSC cofferdam (Cofferdam A)
 - Install DCS pipes/ valve/ fittings (DN500/ DN1400) outside chamber Construction of Valve Chamber
 - Install new connection puddle flange
 - Pipe leakage tests (pre-test)
 - Construction of valve chamber (middle portion)
- Modification to existing pump cell
 - ABWF works
- Extended basement
 - ABWF & MEP work
 - RC Duct work
- Underpass and Associated Area
 - RC Structure (Waffle Ceiling)
- M+ Day 2 Works
 - Hoarding Work
 - Modification Works at M+Day 2 PN2

7.2 Key Issues for the Coming Month

Key issues to be considered at Lyric Theatre Complex in the coming month include:

- Generation of dust from construction works;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste;
- Management of chemicals and avoidance of oil spillage on-site; and
- Operating conditions of drainage facilities.

7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

8 Conclusions and Recommendations

8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken. The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021, and the construction works and EM&A programme for Lyric Theatre Complex was commenced on 1 March 2016.

Monitoring of air quality and noise with respect to the Projects is underway. In particular, the 1-hour TSP, 24-hour TSP, noise level (as L_{eq} , 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action and Limit Levels for 1-hour TSP, 24-hour TSP and noise in the reporting month.

Three environmental complaints were recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

Figure 1 Site Layout Plan and Monitoring Stations

Appendices

- A. Project Organisation
- B. Tentative Construction Programme
- C. Action and Limit Levels for Construction Phase
- D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
- E. Monitoring Schedule
- F. Calibration Certifications
- G. Graphical Plots of the Monitoring Results
- H. Meteorological Data Extracted from Hong Kong Observatory
- I. Waste Flow table
- J. Environmental Mitigation Measures – Implementation Status
- K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

A. Project Organisation

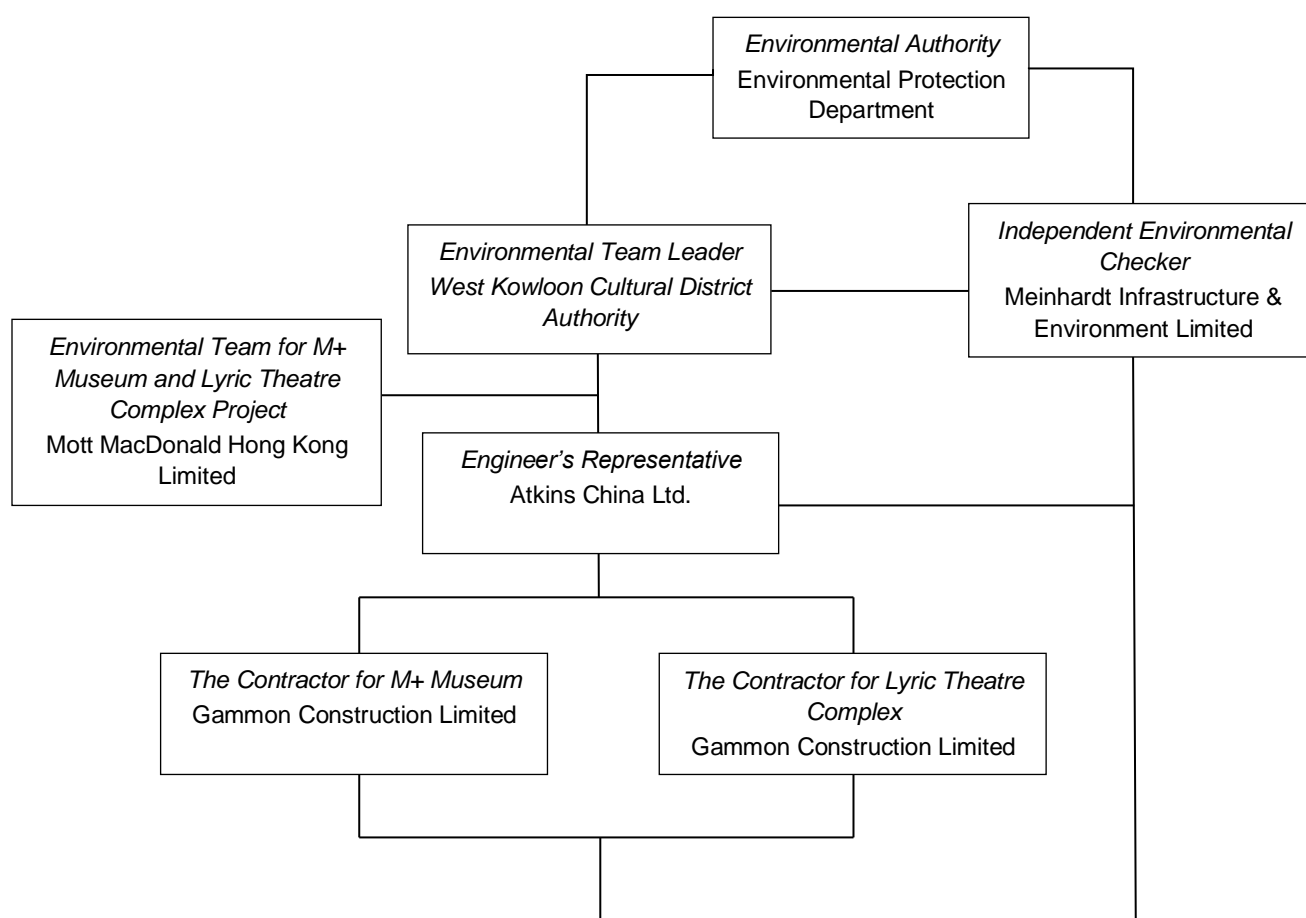


Table A-1: Contact information

Company Name	Role	Name	Telephone	Email
Atkins China Ltd.	Resident Engineer	Ms. Gloria Lui	5506 6361	gloria.lui@atkinglobal.com
Meinhardt Infrastructure & Environment Limited	Independent Environmental Checker	Ms. Claudine Lee	2859 5409	claudinelee@meinhardt.com.hk
Gammon Construction Limited (M+ Museum)	Environmental Manager	Mr. Andy Leung	9489 0035	andy.leung@gammonconstruction.com
Gammon Construction Limited (L1)	Environmental Manager	Ms. Sammie Chan	9864 4296	sammie.chan@gammonconstruction.com
Gammon Construction Limited (L2)	Environmental Manager	Mr. Ivan Chiu	9416 1664	ivan.chiu@gammonconstruction.com
Mott MacDonald Hong Kong Ltd.	Contractor's Environmental Team Leader	Mr. Thomas Chan	2828 5757	thomas.chan@mottmac.com
West Kowloon Cultural District Authority	Senior Project Manager (Safety, Health and Environment)	Mr. C.K. Wu	5506 9178	ck.wu@wkda.hk

B. Tentative Construction Programme

L1

Activity ID	Activity Name	Start Date	Finish Date	2021			
				May 41	Jun 42	Jul 43	Aug 44
L1 Contract for Lyric Theatre Complex (3MRP)							
Cost Centre C - Basement							
Cost Centre C1 - Essential Basement Structure (Excl. AET Protection & Box Culvert)							
SU12000	South Basement - East Area	27-Feb-20 A	15-Jun-21				
SU12300	South Basement - Handover to L2	04-Feb-20 A	30-Jun-21				
SU14300	North Basement - Handover to L2	04-Feb-20 A	30-Jun-21				
Cost Centre C4 - Box Culvert							
SU30000	South Section	30-Dec-20 A	16-Jun-21				
SU31000	North Section	22-Jun-20 A	23-Apr-21 A				
SU32000	Austin Road	29-Jun-20 A	31-Aug-21				
Cost Centre D - Public Infrastructure Works (PIW)							
SU40000	Utilities & Drainage Works	20-Mar-18 A	30-Jun-21				
SU41000	Road Works	04-Oct-18 A	31-Aug-21				
SU42000	Box Culvert Outfall	24-Nov-20 A	08-Sep-21				
Cost Centre E - Miscellaneous Works							
SU50000	External Works - Drainage & Sewerage Works	19-Nov-19 A	30-Jul-21				
SU51000	External Works - Watermain Works	02-Jul-21*	31-Aug-21				
SU52000	DCS Outfall	24-Nov-20 A	08-Sep-21				

- Remaining Work
- Critical Remaining Work
- Actual Work
- Milestone

Project ID: L13MRP-20210531-ENV
Layout: L1-3MRP (Env)
Page: 1 of 1

West Kowloon Cultural District Authority
L1 Contract for Lyric Theatre Complex & Extended Basement
Three Month Rolling Programme (3MRP) - Status as of 31 May 2021



L2

ID	Activity	RD	Start	Finish	BL VAR	LM VAR	TF	2020			2021				2022				2023				2024																				
								Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3																		
								M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
GENERAL & PRELIMINARIES																																											
Contract Significant Dates																																											
Commencement & Completion Dates																																											
Section Keydates																																											
KD05B	Complete Required Pedestrian Access Corridor & associated top slab at Avenue Level [if instructed]	0		31-Dec-21*	133	67	133																																				
KD05C	PC for HO of Landscape Area at Avenue & Pedestrian level between P31 & P34 [if instructed]	0		31-Dec-21*	133	67	133																																				
KD05	PC for HO of the Remaining Works for M+ Promenade South	0		10-Jan-22*	-111	-11	-110																																				
KD05A	Complete Required Pedestrian Access Corridor and Floor Finishes at AURW	0		07-May-22*	6	-60	6																																				
KD08	PC for HO Loc ICT/Risers Rms to APC for ICT Sys Instn Wrks	0		08-Mar-24*	-130	-7	-130																																				
KD10	PC for HO of ASDA, Lyric Theatre Promenade South to Authority	0		08-Mar-24*	-130	-7	-130																																				
KD09	PC for HO of RDE areas for Tenancy Fit-out Wrks	0		08-Mar-24*	-130	-7	-130																																				
KD11	PC for HO of Extended Basement for HO to Authority & HO of Carriageway to Relevant Govt Authority	0		13-May-24*	-135	-7	-135																																				
KD07	PRACTICAL COMPLETION for C'Way 3A (M+ Day 2 Works)	0		11-Jun-24*	-136	-8	-136																																				
KD13	PRACTICAL COMPLETION for Lyric Theatre, Extended Basement & C'Way 3B	0		11-Jun-24*	-136	-8	-136																																				
Stage Keydates																																											
KD01	Compl Dsgn Coor/Subm and obtn NNO for L1 Contr Bsmt constn wrks	0		20-Jul-19 A	0	0	0																																				
KD06	PC for Fountain Related Plantroom(s)	0		04-May-22*	-4	-4	-4																																				
KD03	OBTAIN OP for Lyric Theatre & Extended Basement	0		08-Mar-24*	-130	-7	-130																																				
KD14	Complete U/G road and the associated plantrooms at Zone 3A&3B Integrated Basement	0		23-Mar-24*	-130	-7	-130																																				
KD02	Obtain BA14 Acknowledge from BD for M+ Day2 A&A Works	0		09-May-24*	-134	-7	-134																																				
Summary Program - Level 1																																											
SUM10	[LoE] CC_B Lyric Theatre - Substructure RC Structural Concrete	106	06-May-20 A	27-Sep-21	-90	8	-9																																				
SUM14	[LoE] CC_B Lyric Theatre - ABWF Work Including Theatres (Excl. Punch List Works)	824	24-May-21	11-Mar-24	-103	-6	-31																																				
SUM11	[LoE] CC_B Lyric Theatre - Superstructure RC Structural Concrete	386	12-Jul-21	09-Dec-22	-104	-6	-59																																				
SUM15	[LoE] CC_B Lyric Theatre - MEP 1st to Final Fix (Excl. TH SYS, TH Non-FSD in Walls, etc.)	666	29-Jul-21	01-Nov-23	-128	-6	-44																																				
SUM41	[LoE] CC_B Lyric Theatre - Structural Steel by CSD	411	25-Sep-21	22-Mar-23	-112	-6	-70																																				
SUM12	[LoE] CC_B Lyric Theatre - EWS Weather Tight Type	300	03-Jan-22	10-Feb-23	-101	-6	85																																				
SUM17	[LoE] CC_B Lyric Theatre - Theatre Specialist Systems Incl. T&C, Precom. & Commissioning	636	08-Apr-22	08-Jun-24	-102	-5	-102																																				
SUM13	[LoE] CC_B Lyric Theatre - EWS Non-Weather Tight Type 4.1 & 4.3	312	19-Jul-22	11-Sep-23	-96	-6	6																																				
SUM16	[LoE] CC_B Lyric Theatre - T&C (Excluding Non-FSD ELV & Electrical)	139	20-May-23	04-Nov-23	-103	-6	-103																																				
SUM18	[LoE] CC_B Lyric Theatre, EB, C'Way 3B - Stat. Insp. & Approval (from Form 314/501 to BD OP)	98	06-Nov-23	08-Mar-24	-103	-6	-103																																				
SUM21	[LoE] CC_C - LT EVA1 & EVA2	757	12-Apr-21 A	09-Feb-24	-101	-6	-85																																				
SUM23	[LoE] CC_C - Artist SQ. Bridge (ASB_1/2/3; ASB_3; P31_2; P34_2; AS_1/2; ASB-6/P31 EVA)	704	17-May-21	18-Dec-23	-44	-7	-42																																				
SUM22	[LoE] CC_C - HoR Development (P32-1, P29-1, P31-EVA)	611	16-Jul-21	19-Oct-23	6	-7	8																																				
SUM20	[LoE] CC_C - LT Promenade & Pocket Square Bridge	644	28-Sep-21	01-Feb-24	-138	0	-78																																				
SUM24	[LoE] CC_D - Remaining Works for M+ Promenade South	188	18-Feb-21 A	10-Jan-22	-86	-8	-86																																				
SUM25	[LoE] CC_E - DCS Cofferdam A Works & Obtain BA14	347	23-Jun-20 A	16-Aug-22	-80	-15	-52																																				
SUM42	[LoE] CC_E - DCS Outside of Cofferdam A Works (Connect DIA1,600 & Remove Temp O'fall)	435	01-Sep-21	30-Mar-23	-138	0	-78																																				
SUM26	[LoE] CC_F - Mods to Existing Pump Cell Civil & MEP Works (Excl. Options 2 Add. Pumps)	271	20-May-21	18-May-22	-196	0	82																																				
SUM27	[LoE] CC_G Extended Basement - ABWF Works (Incl. Deferred Areas Under Deck)	633	26-May-21	20-Jul-23	-99	-7	123																																				
SUM28	[LoE] CC_G Extended Basement - MEP 1st Fix to Final Fix (Incl. Deferred Areas Under Deck)	587	29-Jun-21	28-Jun-23	-99	-7	-50																																				
SUM29	[LoE] CC_G Extended Basement - T&C	292	23-Jul-22	20-Jul-23	-99	-7	-50																																				
SUM30	[LoE] CC_H - Vibration Isolation Spring System Remaining as of 30Apr2020 (AS=30Sep19)	0	09-May-20 A	10-Feb-21 A	-35	0	0																																				
SUM31	[LoE] CC_I Carriageway 3B - ABWF Works	456	16-Jun-21	28-Dec-22	-51	0	257																																				
SUM32	[LoE] CC_I Carriageway 3B - MEP Works (1st Fix to Final Fix)	357	03-Aug-21	18-Oct-22	-37	0	115																																				
SUM33	[LoE] CC_I Underpass 3B & Associated Area - T&C	108	24-Oct-22	08-Mar-23	-90	0	57																																				
SUM35	[LoE] CC_J - M+ Day 2 Works (excl. connections to M+ and SZ_1 FS Changeover)	762	18-May-21	14-Dec-23	-111	-7	-83																																				
SUM38	[LoE] CC_J - M+ Day 2 FS Changeover in 3A SZ_1, Connections to M+, Integrated T&C	99	20-Nov-23	23-Mar-24	-103	-6	-103																																				
SUM34	[LoE] CC_J Carriageway 3A - Stat. Insp. & Approvals (from Form 314A to BA14)	56	29-Feb-24	09-May-24	-103	-6	-103																																				
SUM39	[LoE] CC_K - Water Main at Promenade	253	17-Aug-22	21-Jul-23	-138	0	-78																																				
SUM40	[LoE] CC_N Lifts & Escalators	458	29-Dec-21	25-Jul-23	-71	-7	-6																																				



	Base Line ACT		Current - MEP Works
	Base Line MS		Current - ABWF Works
	Milestone		Current - Facade Works
	Current - Other Works		Critical Works
	Current - Struct Works		Actual

L2 CMWP_R01_08 Approved 29Sep20 - 8th Update DD=30Apr21

Date	Revision	Checked	Approved
10-May-21	CMWP Rev_1_08 - 8th Update DD 30Apr21	NS	IH

C. Action and Limit Levels for Construction Phase

Air Quality

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring station are presented in following tables:

Table C-1: Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level (mg/m ³)	Limit Level (mg/m ³)
AM1	273.7	500
AM2B	274.2	500

Table C-2: Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (µg/m ³)	Limit Level (µg/m ³)
AM1	143.6	260
AM2B	151.1	260

Noise

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

Table C-3: Action and Limit Levels for Construction Noise

Time Period & Monitoring Locations	Action Level	Limit Level
NM1A 0700-1900 hours on normal weekdays	When one valid documented complaint is received.	75 dB(A)

D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact

Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D-1: Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	WKCD	Contractor
Action Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and WKCD; 3. Advise the WKCD on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCD; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to WKCD within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCD, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCD on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.

Event

Action

<p>2. Exceedance for two or more consecutive samples</p>	<ol style="list-style-type: none"> 1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.
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Construction Noise

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D-2: Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	WKCD	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify WKCD, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCD and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCD accordingly; 3. Advise the WKCD on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and WKCD; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, WKCD, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCD on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst WKCD, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCD accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and WKCD within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCD until the exceedance is abated.

Landscape and Visual Impact

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

Table D-3: Event and Action Plan for Landscape and Visual Impact

Event	Action			
	ET	IEC	WKCDA	Contractor
Design Check	<ol style="list-style-type: none"> Design check to make sure the design complies with all the proposed mitigation measures in the EIA report; Prepare and submit report. 	<ol style="list-style-type: none"> Check report submitted by ET; Recommend remedial design if necessary. 	<ol style="list-style-type: none"> Undertake remedial design if necessary. 	-
Non-conformity on one occasion	<ol style="list-style-type: none"> Identify source of non-conformity; Report to IEC and WKCDA; Discuss remedial actions with IEC, WKCDA and Contractor; Monitor remedial actions until rectification has been completed. 	<ol style="list-style-type: none"> Check and verify source of non-conformity; Discuss remedial actions with ET and Contractor; Advise WKCDA on effectiveness of proposed remedial actions; Check implementation of remedial actions. 	<ol style="list-style-type: none"> Notify Contractor; Ensure remedial actions are properly implemented. 	<ol style="list-style-type: none"> Amend working method as necessary; Rectify damage and undertake necessary replacement and remedial actions.
Repeated conformity	<ol style="list-style-type: none"> Identify source of non-conformity; Report to IEC and WKCDA; Increase monitoring frequency; Discuss remedial actions with IEC, WKCDA and Contractor; Monitor remedial actions until rectification has been completed; If non-conformity rectified, reduce monitoring frequency back to normal. 	<ol style="list-style-type: none"> Check and verify source of non-conformity; Check Contractor's working method; Discuss remedial actions with ET and Contractor; Advise WKCDA on effectiveness of proposed remedial actions; Supervise implementation of remedial actions. 	<ol style="list-style-type: none"> Notify Contractor; Ensure remedial actions are properly implemented. 	<ol style="list-style-type: none"> Amend working method as necessary; Rectify damage and undertake necessary replacement and remedial actions.

E. Monitoring Schedule

May 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	1
2	3	4 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	5 Lyric Landscape & Visual Inspection	6	7	8
9	10 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	11	12	13	14 AM1, AM2B - 24hrTSP, 1hr TSP x3	15
16	17	18	19	20 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring Lyric Landscape & Visual Inspection	21	22
23	24	25	26 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	27	28	29
30	31	Notes: AM1 - International Commerce Centre (ICC) AM2B - 1st Floor of Gammon's Site Office NM1A - International Commerce Centre (ICC)				

June 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	2	3	4	5
6	7 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	8	9	10	11 AM1, AM2B - 24hrTSP, 1hr TSP x3	12
13	14	15	16	17 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	18	19
20	21	22	23 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	24	25	26
27	28	29 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	30	1	2	3
4	5	Notes: AM1 - International Commerce Centre (ICC) AM2 - The Harbourside Tower 1 - Ground Floor NM1A - International Commerce Centre (ICC)				

F. Calibration Certifications

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM1 (ICC)
 Calibrated by : K.T.Ho
 Date : 19/03/2021

Sampler

Model : TE-5170
 Serial Number : S/N 0767

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 28 Jan 2021
 Slope (m) : 2.06072
 Intercept (b) : -0.01465
 Correlation Coefficient(r) : 0.99993

Standard Condition

Pstd (hpa) : 1013
 Tstd (K) : 298.18

Calibration Condition

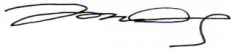
Pa (hpa) : 1011
 Ta(K) : 300

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	11.2	3.332	1.624	58	57.75
2 13 holes	8.2	2.851	1.391	50	49.78
3 10 holes	6.2	2.479	1.210	42	41.82
4 7 holes	4.4	2.089	1.021	34	33.85
5 5 holes	2.6	1.605	0.786	22	21.90

Notes: $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$, $X = Z/m - b$, $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 42.832 Intercept(b): -10.649 Correlation Coefficient(r): 0.9943

Checked by: 

 Magnum Fan

Date: 23/03/2021

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM1 (ICC)
 Calibrated by : K.T.Ho
 Date : 18/05/2021

Sampler

Model : TE-5170
 Serial Number : S/N 0767

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 28 Jan 2021
 Slope (m) : 2.06072
 Intercept (b) : -0.01465
 Correlation Coefficient(r) : 0.99993

Standard Condition

Pstd (hpa) : 1013
 Tstd (K) : 298.18

Calibration Condition

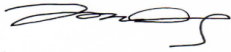
Pa (hpa) : 1010
 Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	10.2	3.152	1.537	58	57.2
2 13 holes	7.4	2.685	1.310	50	49.3
3 10 holes	5.6	2.336	1.141	42	41.5
4 7 holes	3.6	1.873	0.916	32	31.6
5 5 holes	2.4	1.529	0.749	22	21.7

Notes: $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$, $X = Z/m - b$, $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 44.946 Intercept(b): -10.540 Correlation Coefficient(r): 0.9961

Checked by: 

 Magnum Fan

Date: 21/05/2021

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM2B (Gammon Office)
 Calibrated by : K.T.Ho
 Date : 19/03/2021

Sampler

Model : TE-5170
 Serial Number : S/N 8919

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 28 Jan 2021
 Slope (m) : 2.06072
 Intercept (b) : -0.01465
 Correlation Coefficient(r) : 0.99993

Standard Condition

Pstd (hpa) : 1013
 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1011
 Ta(K) : 300

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	12.4	3.506	1.709	60	59.74
2 13 holes	9.0	2.987	1.457	52	51.78
3 10 holes	6.4	2.519	1.229	44	43.81
4 7 holes	4.2	2.041	0.997	36	35.84
5 5 holes	2.2	1.477	0.724	26	25.89

Notes: $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$, $X = Z/m - b$, $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 34.446 Intercept(b): +1.280 Correlation Coefficient(r): 0.9997

Checked by: 
 Magnum Fan

Date: 23/03/2021

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM2B (Gammon Office)
 Calibrated by : K.T.Ho
 Date : 18/05/2021

Sampler

Model : TE-5170
 Serial Number : S/N 8919

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454
 Service Date : 28 Jan 2021
 Slope (m) : 2.06072
 Intercept (b) : -0.01465
 Correlation Coefficient(r) : 0.99993

Standard Condition

Pstd (hpa) : 1013
 Tstd (K) : 298.18

Calibration Condition

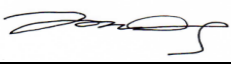
Pa (hpa) : 1010
 Ta(K) : 305

Resistance Plate	dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1 18 holes	12.0	3.419	1.666	60	59.22
2 13 holes	8.2	2.826	1.379	50	49.35
3 10 holes	6.2	2.458	1.200	42	41.45
4 7 holes	3.8	1.924	0.941	32	31.58
5 5 holes	2.2	1.464	0.718	20	19.74

Notes: $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$, $X = Z/m - b$, $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 41.311 Intercept(b): -8.501 Correlation Coefficient(r): 0.9970

Checked by: 

 Magnum Fan

Date: 21/05/2021



Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 28, 2021	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 763.5	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 2454		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4540	3.2	2.00
2	3	4	1	1.0210	6.4	4.00
3	5	6	1	0.9110	8.0	5.00
4	7	8	1	0.8730	8.8	5.50
5	9	10	1	0.7200	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0140	0.6974	1.4271	0.9958	0.6849	0.8776
1.0098	0.9890	2.0182	0.9916	0.9712	1.2411
1.0076	1.1061	2.2564	0.9895	1.0862	1.3875
1.0066	1.1530	2.3666	0.9885	1.1323	1.4553
1.0011	1.3904	2.8542	0.9831	1.3654	1.7551
QSTD	m=	2.06072	QA	m=	1.29039
	b=	-0.01465		b=	-0.00901
	r=	0.99993		r=	0.99993

Calculations	
Vstd= $\Delta Vol \left(\frac{Pa - \Delta P}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left(\frac{Pa - \Delta P}{Pa} \right)$
Qstd= $Vstd / \Delta Time$	Qa= $Va / \Delta Time$
For subsequent flow rate calculations:	
Qstd= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR K.W. FAN	WORK ORDER	: HK2045301
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM113, 1/F, MY LOFT, 9 HOI WING ROAD, TUEN MUN, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 24-NOV-2020
		DATE OF ISSUE	: 30-NOV-2020
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.
- Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**

11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK2045301
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2045301-001	S/N: 245833	Equipments	24-Nov-2020	S/N: 245833

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
Manufacturer: Sibata LD-3B
Serial No. 245833
Equipment Ref: Nil
Job Order HK2045301

Standard Equipment:

Standard Equipment: Higher Volume Sampler (TSP)
Location & Location ID: AUES office (calibration room)
Equipment Ref: HVS 018
Last Calibration Date: 8 October 2020

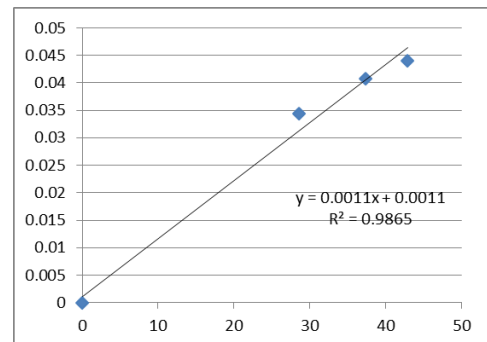
Equipment Verification Results:

Verification Date: 26 November 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
2hr01min	09:18 ~ 11:19	24.0	1019.3	0.041	4525	37.3
2hr	11:22 ~ 13:22	24.0	1019.3	0.034	3430	28.6
2hr01min	13:25 ~ 15:26	24.0	1019.3	0.044	5196	42.9

Linear Regression of Y or X

Slope (K-factor): 0.0011
Correlation Coefficient 0.9932
Date of Issue 30 November 2020



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0011 should be applied for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Fai So Signature :  Date : 30 November 2020

QC Reviewer : Ben Tam Signature :  Date : 30 November 2020



ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR K.W. FAN	WORK ORDER	: HK2045304
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM113, 1/F, MY LOFT, 9 HOI WING ROAD, TUEN MUN, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 24-NOV-2020
		DATE OF ISSUE	: 30-NOV-2020
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.
- Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group

11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK2045304
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2045304-001	S/N: 276015	Equipments	24-Nov-2020	S/N: 276015

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 276015
 Equipment Ref: Nil
 Job Order HK2045304

Standard Equipment:

Standard Equipment: Higher Volume Sampler (TSP)
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 8 October 2020

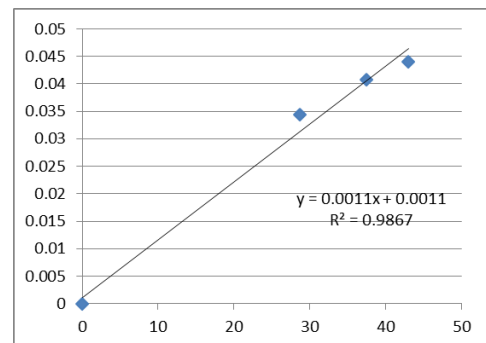
Equipment Verification Results:

Verification Date: 26 November 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
2hr01min	09:18 ~ 11:19	24.0	1019.3	0.041	4541	37.5
2hr	11:22 ~ 13:22	24.0	1019.3	0.034	3443	28.7
2hr01min	13:25 ~ 15:26	24.0	1019.3	0.044	5211	43.0

Linear Regression of Y or X


Slope (K-factor): 0.0011
 Correlation Coefficient 0.9933
 Date of Issue 30 November 2020



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0011 should be applied for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Fai So Signature :  Date : 30 November 2020

QC Reviewer : Ben Tam Signature :  Date : 30 November 2020



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C203822

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1389)

Date of Receipt / 收件日期 : 30 June 2020

Description / 儀器名稱 : Sound Level Meter

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 01010406

Supplied By / 委託者 : Envirotech Services Co.

Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 July 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed manufacturer's specification.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested By

測試

:

K P Cheuk
Assistant Engineer

Certified By

核證

:

K C Lee
Engineer

Date of Issue

簽發日期

:

10 July 2020

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C203822

證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C200258
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.8	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	93.8 (Ref.)
				104.00		103.9
				114.00		113.8

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.8	Ref.
			Slow			93.8	± 0.3

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Certificate of Calibration

校正證書

Certificate No. : C203822
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.5	-26.2 ± 1.5
					125 Hz	77.6	-16.1 ± 1.5
					250 Hz	85.1	-8.6 ± 1.4
					500 Hz	90.6	-3.2 ± 1.4
					1 kHz	93.8	Ref.
					2 kHz	95.1	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.8	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.4	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	92.9	-0.8 ± 1.5
					125 Hz	93.6	-0.2 ± 1.5
					250 Hz	93.8	0.0 ± 1.4
					500 Hz	93.8	0.0 ± 1.4
					1 kHz	93.8	Ref.
					2 kHz	93.7	-0.2 ± 1.6
					4 kHz	93.0	-0.8 ± 1.6
					8 kHz	90.9	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.5	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C203822
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 04871

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited Calibration & Testing Laboratory

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輝創工程有限公司 - 校正及檢測實驗室

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C210001

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-2688) Date of Receipt / 收件日期 : 18 December 2020

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 11334

Supplied By / 委託者 : Envirotech Services Co.

Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 2 January 2021

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed manufacturer's specification & user's specified acceptance criteria.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By
測試

:

H T Wong
Assistant Engineer

Certified By
核證

:

K C Lee
Engineer

Date of Issue
簽發日期

:

4 January 2021

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

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Page 1 of 2

Certificate of Calibration

校正證書

Certificate No. : C210001
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C203952
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C201309

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.7	± 0.5	± 0.2
114 dB, 1 kHz	113.7		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

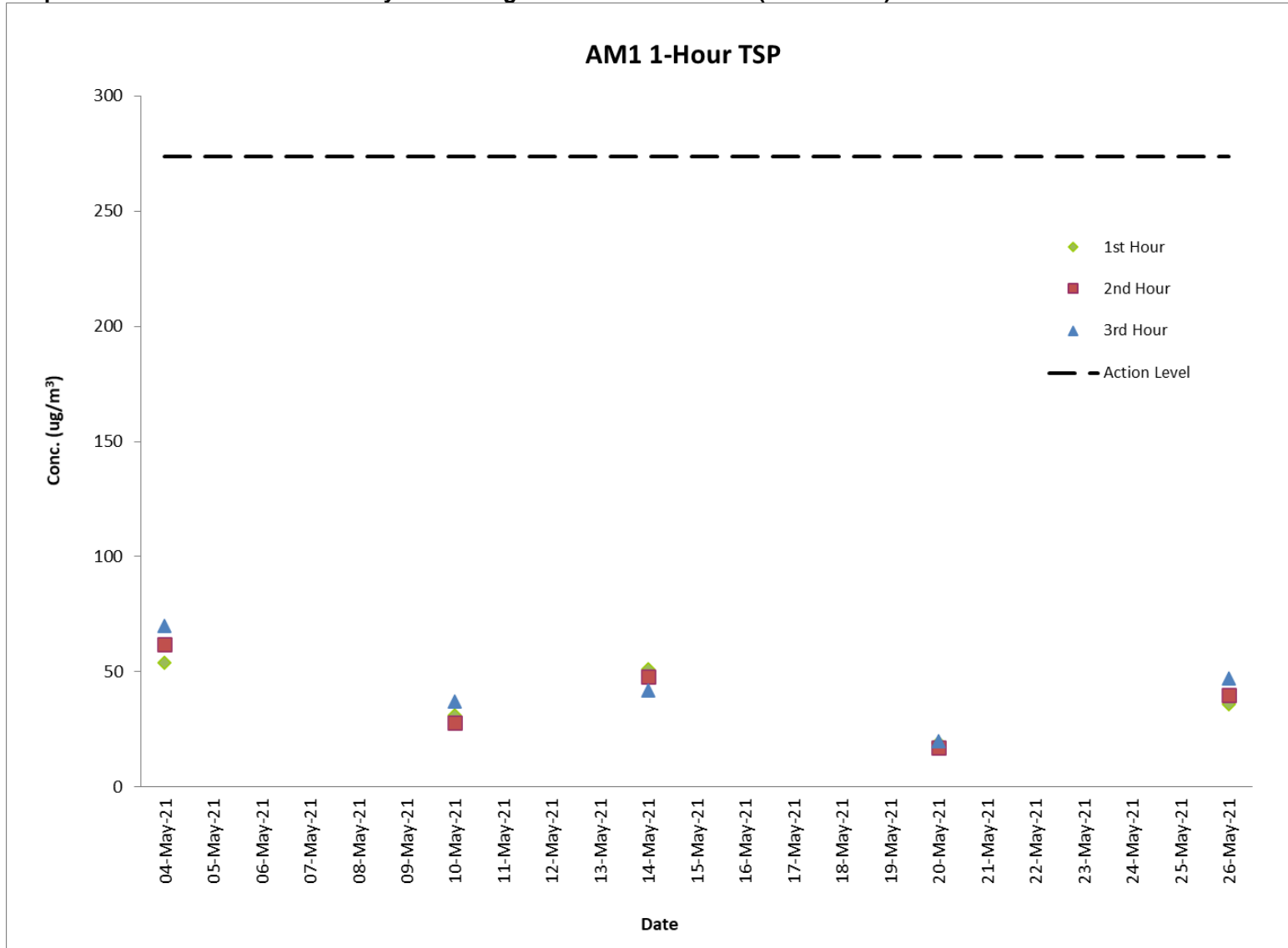
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

G. Graphical Plots of the Monitoring Results

Air Quality Monitoring Result at Station AM1 (1-hour TSP)

Date	Weather Condition	Time	Conc. ($\mu\text{g}/\text{m}^3$)			Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1 st Hour	2 nd Hour	3 rd Hour		
04-May-21	Cloudy	8:32 - 11:32	54	62	70	273.7	500
10-May-21	Fine	8:22 - 11:22	31	28	37	273.7	500
14-May-21	Cloudy	8:32 - 11:32	51	48	42	273.7	500
20-May-21	Cloudy	8:20 - 11:20	19	17	20	273.7	500
26-May-21	Fine	8:32 - 11:32	36	40	47	273.7	500

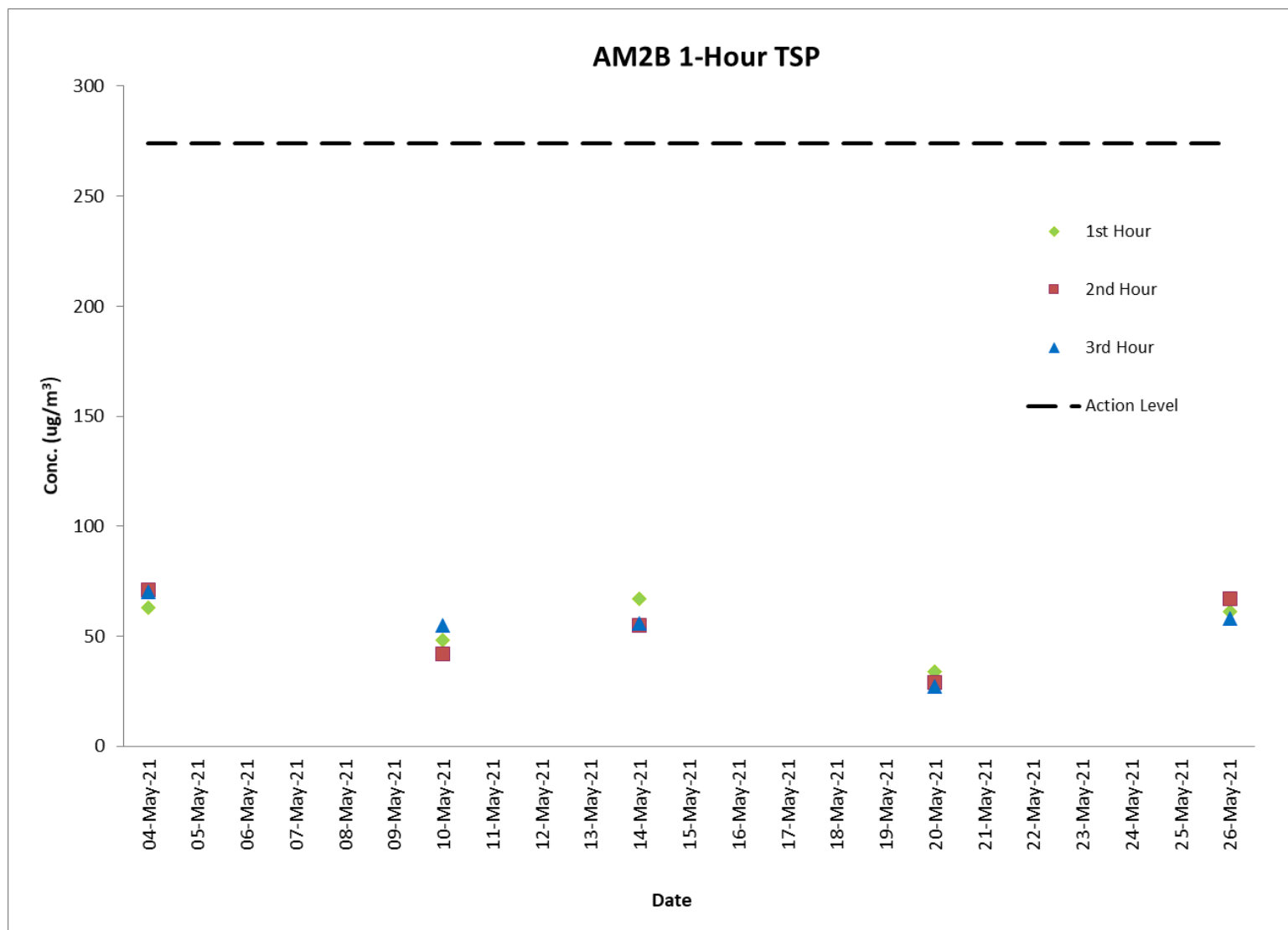
Graphical Presentation of Air Quality Monitoring Result at Station AM1 (1-hour TSP)



Air Quality Monitoring Result at Station AM2B (1-hour TSP)

Date	Weather Condition	Time	Conc. ($\mu\text{g}/\text{m}^3$)			Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1 st Hour	2 nd Hour	3 rd Hour		
04-May-21	Cloudy	8:52 - 11:52	63	71	70	274.2	500
10-May-21	Fine	8:43 - 11:43	48	42	55	274.2	500
14-May-21	Cloudy	8:52 - 11:52	67	55	56	274.2	500
20-May-21	Cloudy	8:42 - 11:42	34	29	27	274.2	500
26-May-21	Fine	8:48 - 11:48	61	67	58	274.2	500

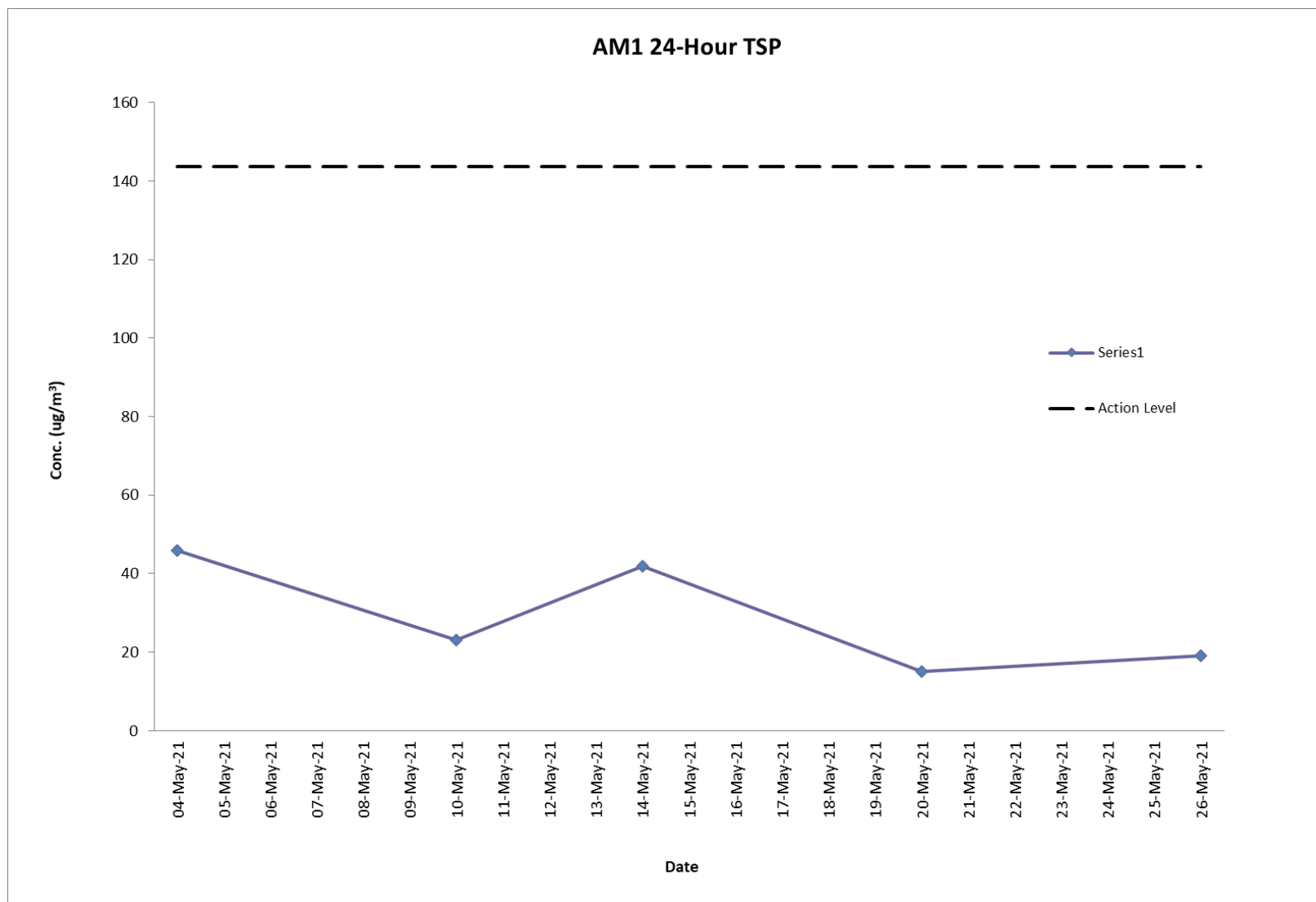
Graphical Presentation of Air Quality Monitoring Result at Station AM2B (1-hour TSP)



Air Quality Monitoring Result at Station AM1 (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			Conc. (µg/m ³)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
04-May-21	08:30	05-May-21	08:30	2.6531	2.7337	23312.38	23336.38	24	1.23	1.23	1.23	46	Cloudy	143.6	260
10-May-21	08:20	11-May-21	08:20	2.6610	2.7025	23336.38	23360.38	24	1.23	1.23	1.23	23	Fine	143.6	260
14-May-21	08:30	15-May-21	08:30	2.6544	2.7293	23360.38	23384.38	24	1.23	1.23	1.23	42	Cloudy	143.6	260
20-May-21	08:18	21-May-21	08:18	2.6654	2.6906	23384.38	23408.38	24	1.17	1.17	1.17	15	Cloudy	143.6	260
26-May-21	08:30	27-May-21	08:30	2.6688	2.7006	23408.38	23432.38	24	1.17	1.17	1.17	19	Fine	143.6	260

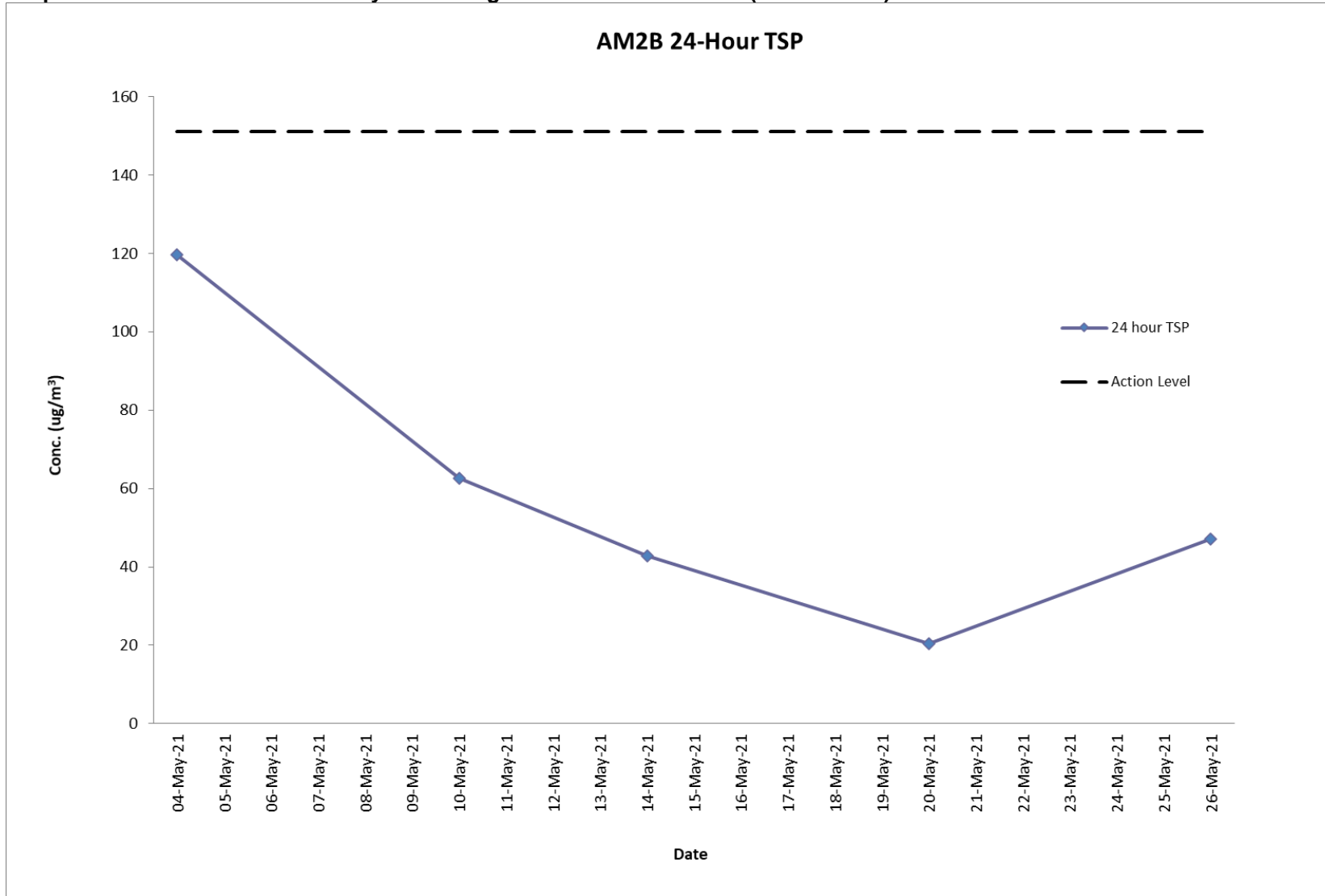
Graphical Presentation of Air Quality Monitoring Result at Station AM1 (24-hour TSP)



Air Quality Monitoring Result at Station AM2B (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			Conc. (µg/m ³)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
04-May-21	08:46	05-May-21	08:46	2.6528	2.8560	22867.05	22891.05	24	1.18	1.18	1.18	120	Cloudy	151.1	260
10-May-21	08:36	11-May-21	08:36	2.6531	2.7594	22891.05	22915.05	24	1.18	1.18	1.18	63	Fine	151.1	260
14-May-21	08:46	15-May-21	08:46	2.6662	2.7390	22915.05	22939.05	24	1.18	1.18	1.18	43	Cloudy	151.1	260
20-May-21	08:36	21-May-21	08:36	2.6648	2.7008	22939.05	22963.05	24	1.22	1.22	1.22	20	Cloudy	151.1	260
26-May-21	08:46	27-May-21	08:46	2.6637	2.7466	22963.05	22987.05	24	1.22	1.22	1.22	47	Fine	151.1	260

Graphical Presentation of Air Quality Monitoring Result at Station AM2B (24-hour TSP)



Noise Monitoring Result at Station NM1A

Date	Time	Measured L ₁₀ , dB(A)	Measured L ₉₀ , dB(A)	L _{eq} (30 min.)*, dB(A)
04-May-21	09:35	65.4	61.5	68
04-May-21	09:40	66.2	62.6	
04-May-21	09:45	66.0	62.1	
04-May-21	09:50	67.7	63.5	
04-May-21	09:55	67.8	63.6	
04-May-21	10:00	68.7	64.6	
10-May-21	09:26	65.5	61.3	67
10-May-21	09:31	66.0	62.4	
10-May-21	09:36	66.7	62.7	
10-May-21	09:41	67.2	63.8	
10-May-21	09:46	65.9	61.1	
10-May-21	09:51	65.2	61.4	
20-May-21	09:25	65.0	61.4	67
20-May-21	09:30	66.6	62.8	
20-May-21	09:35	66.2	62.1	
20-May-21	09:40	65.4	61.2	
20-May-21	09:45	65.7	61.6	
20-May-21	09:50	64.3	60.9	
26-May-21	09:35	65.1	61.9	68
26-May-21	09:40	66.0	62.2	
26-May-21	09:45	67.2	63.8	
26-May-21	09:50	65.1	61.5	
26-May-21	09:55	66.5	62.7	
26-May-21	10:00	67.3	63.9	

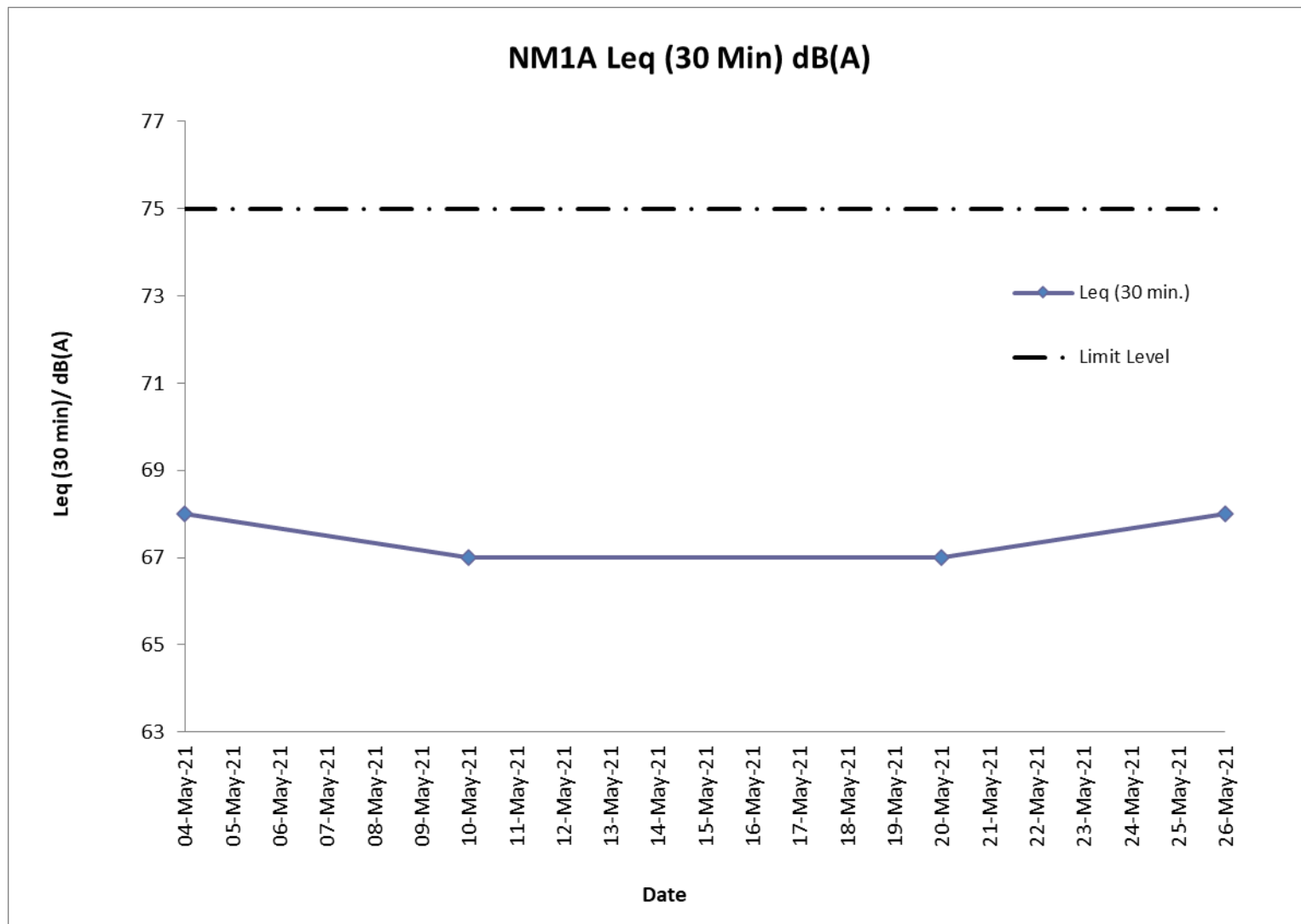
Remarks:

* +3dB (A) correction was applied to free-field measurement.



The station set-up of a free-field measurement at Station NM1A.

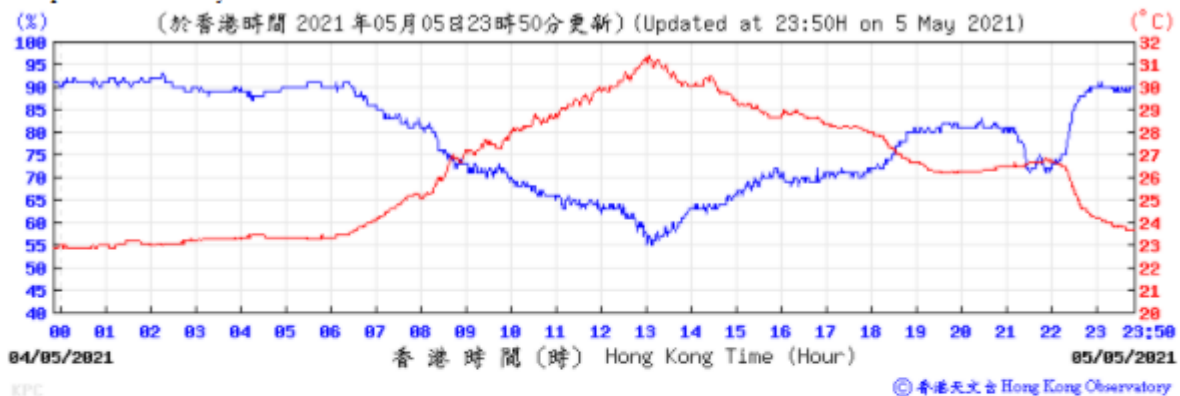
Graphical Presentation Noise Monitoring Result at Station NM1A



H. Meteorological Data Extracted from Hong Kong Observatory

Extract of Meteorological Observations for King's Park Automatic Weather Station, May 2021

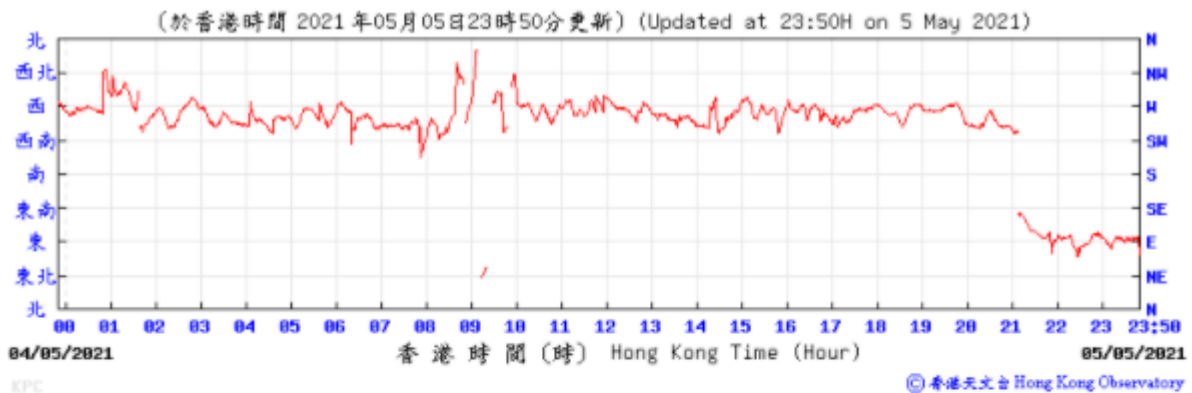
Temperature/Humidity:



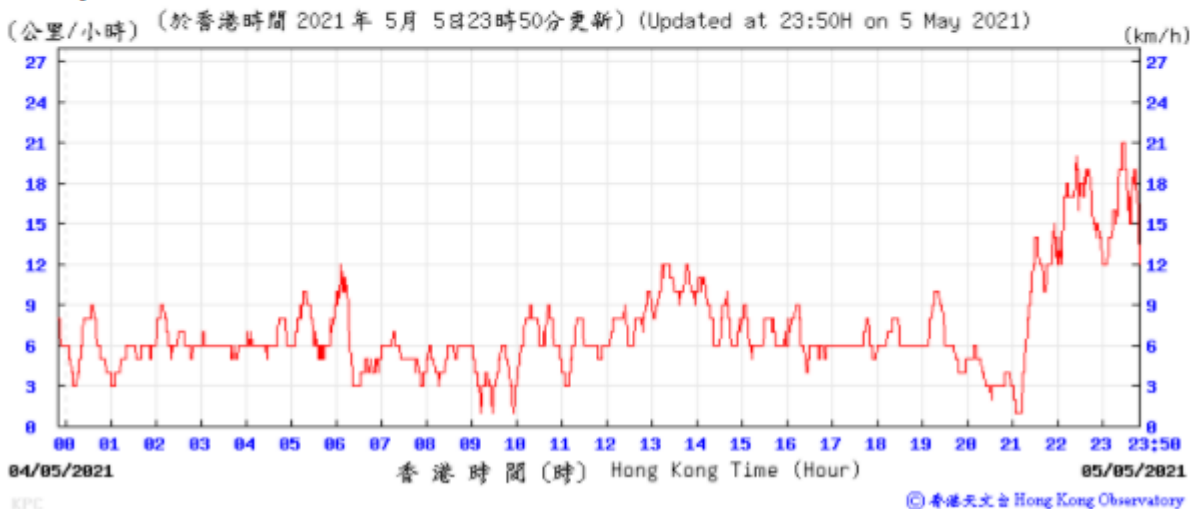
Pressure:



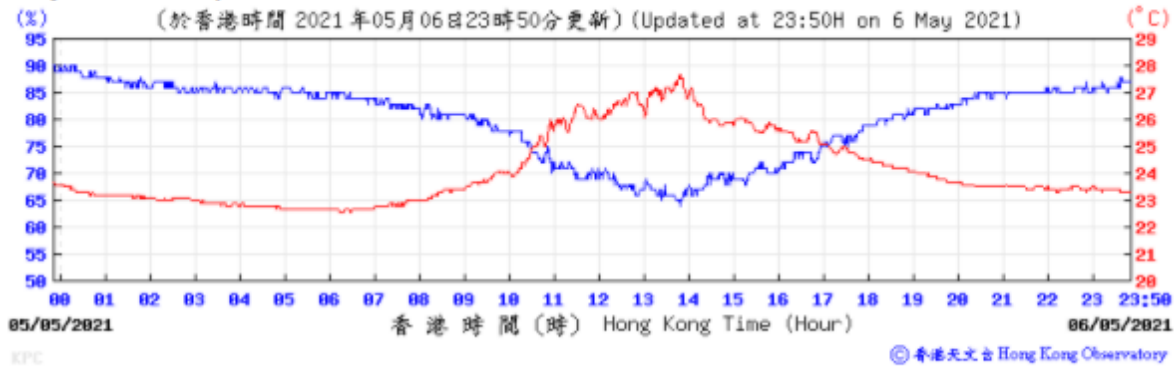
Wind Direction:



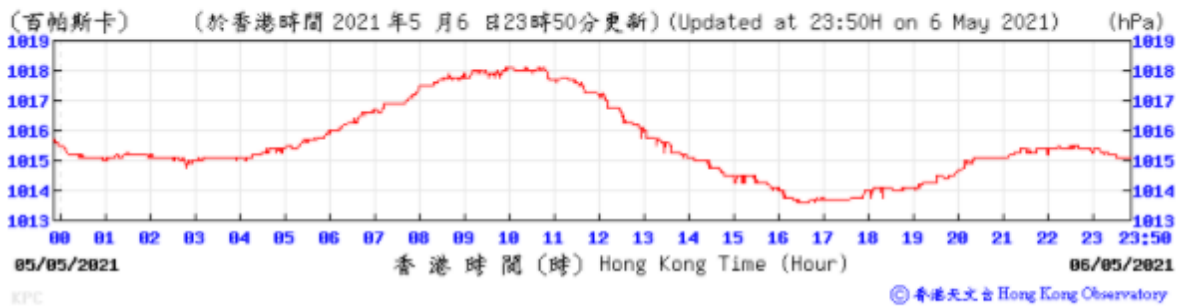
Wind Speed:



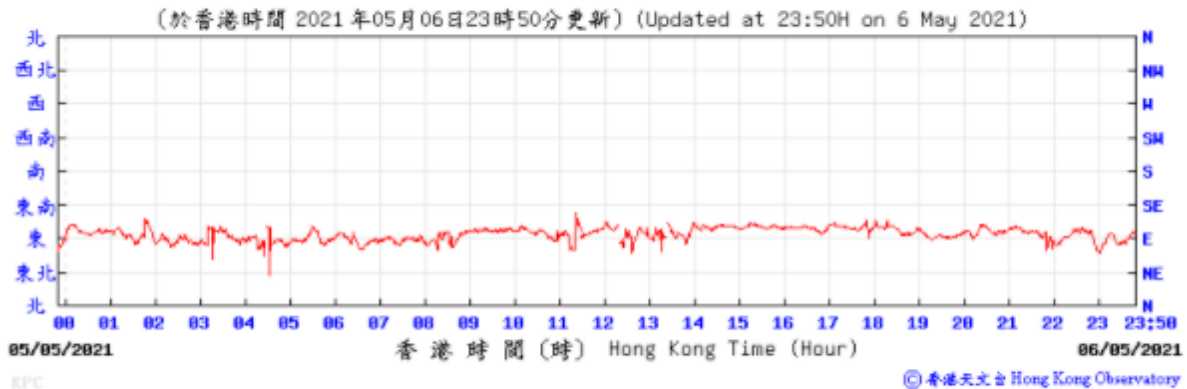
Temperature/Humidity:



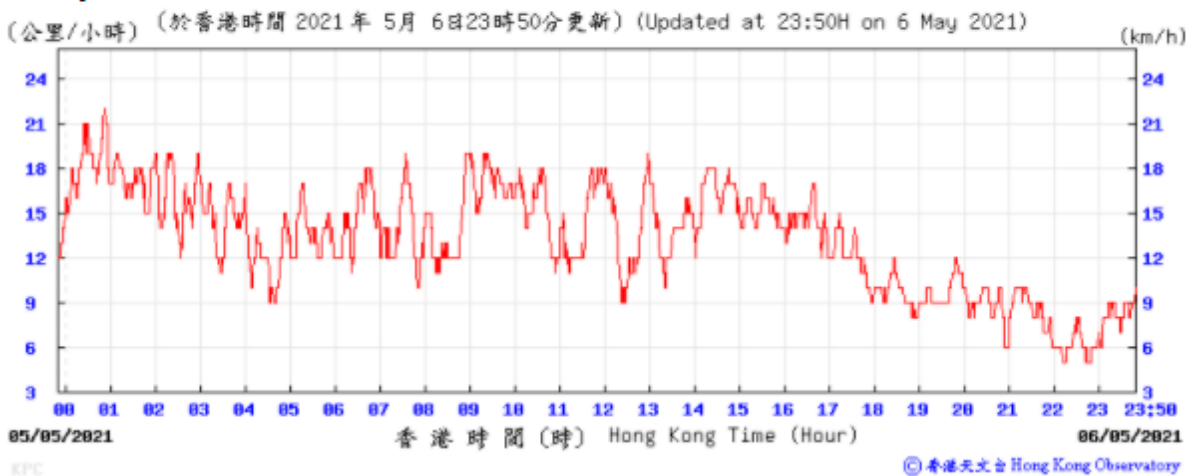
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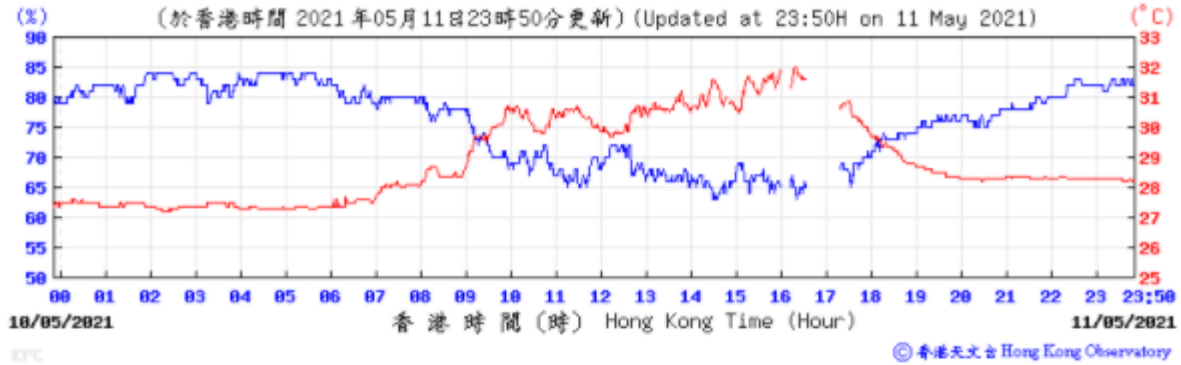
Wind Direction:



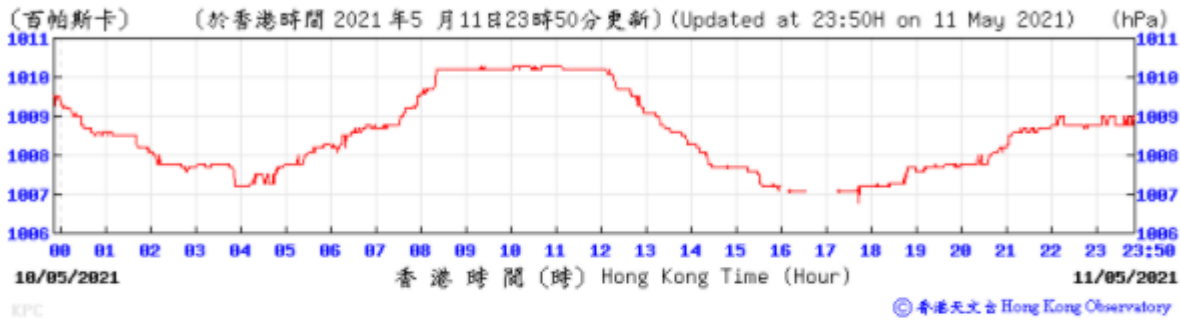
Wind Speed:



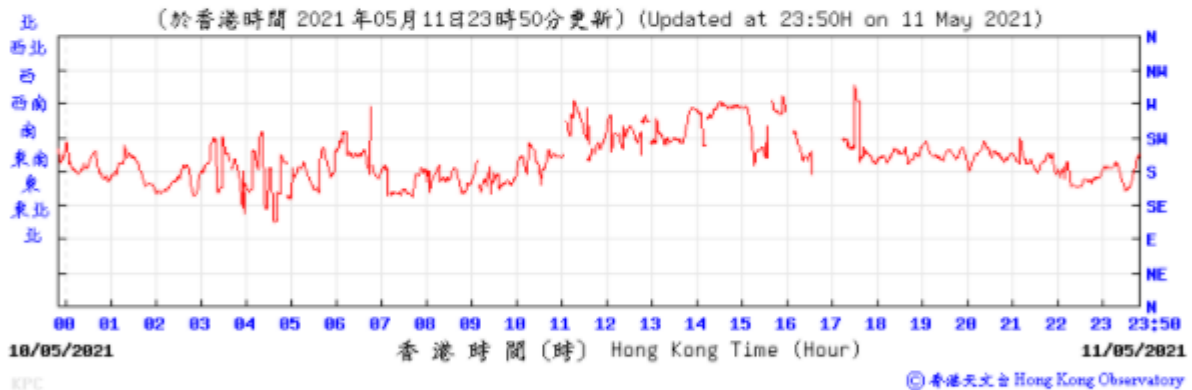
Temperature/Humidity:



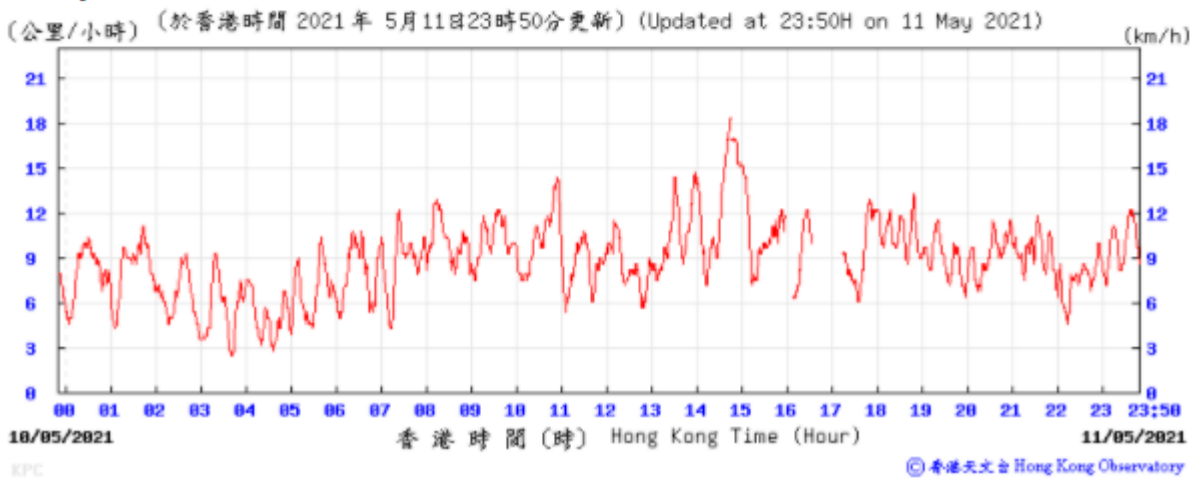
Pressure:



Wind Direction:



Wind Speed:



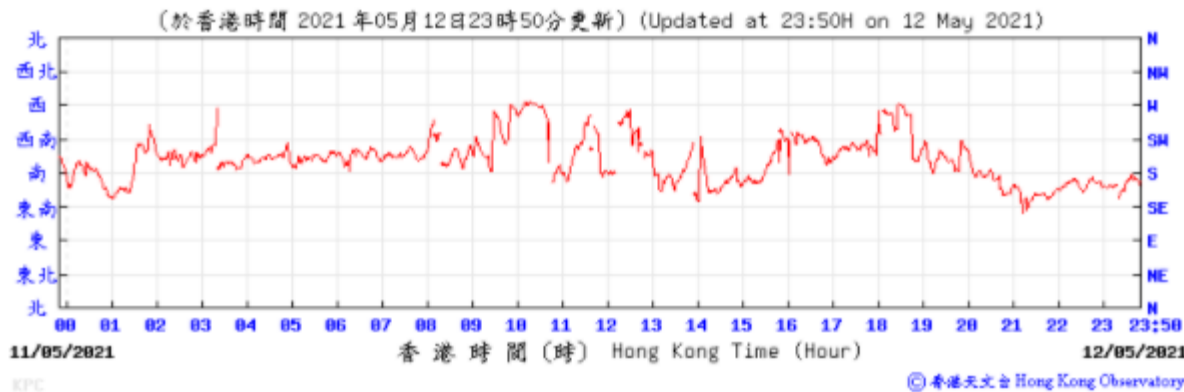
Temperature/Humidity:



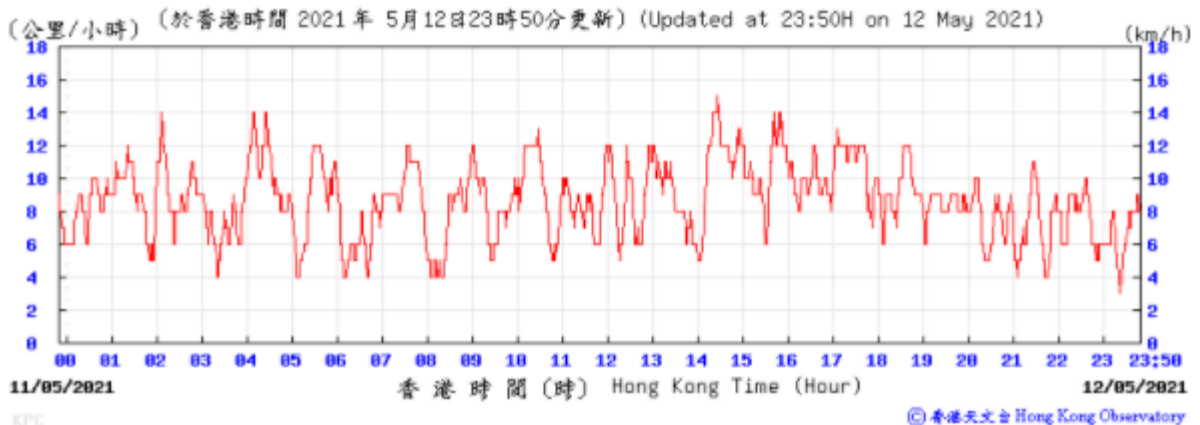
Pressure:



Wind Direction:



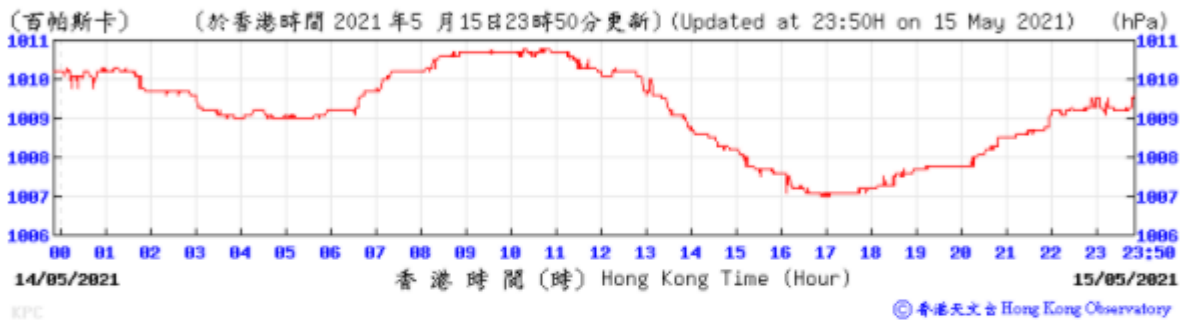
Wind Speed:



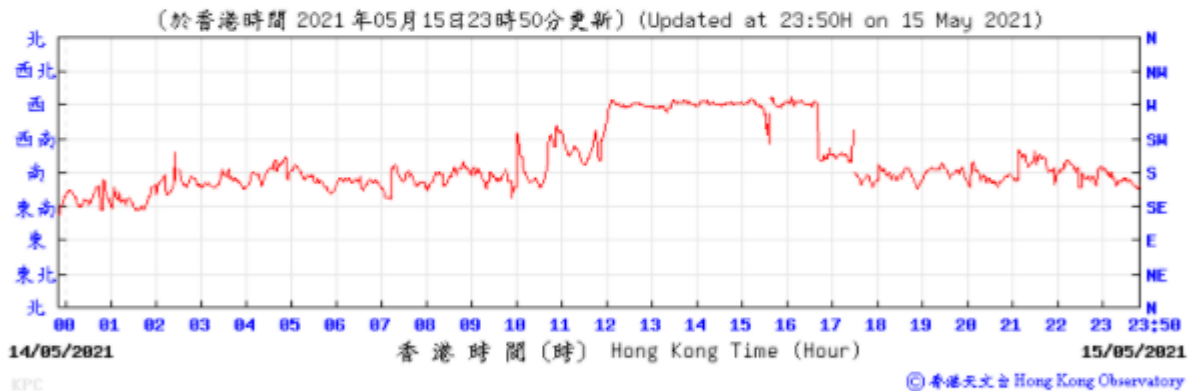
Temperature/Humidity:



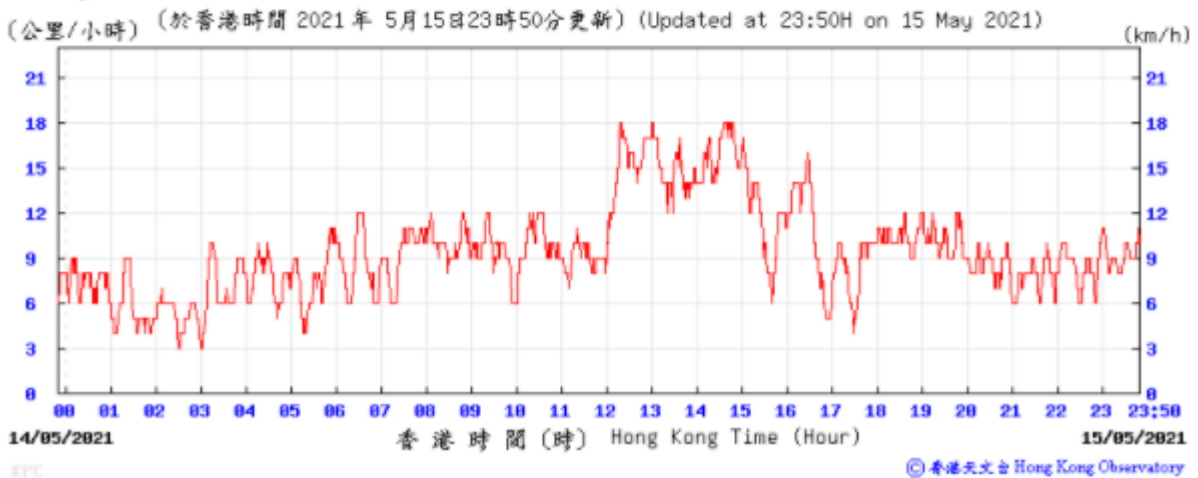
Pressure:



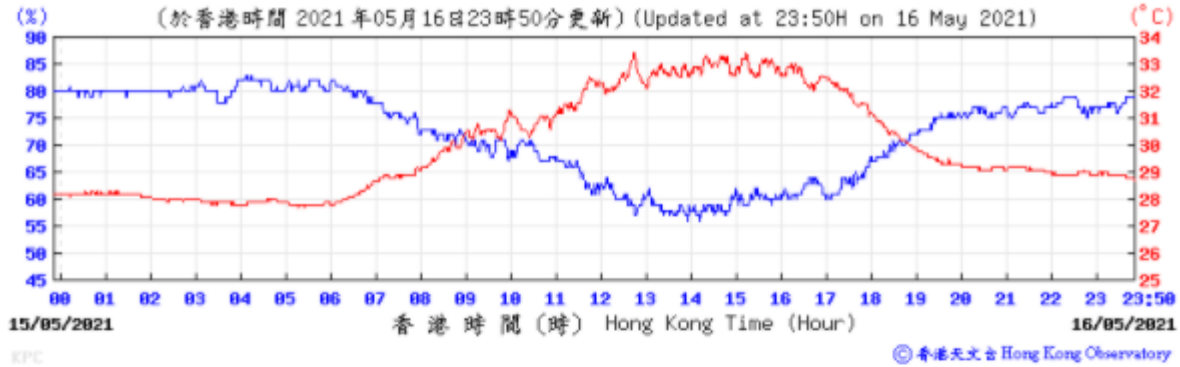
Wind Direction:



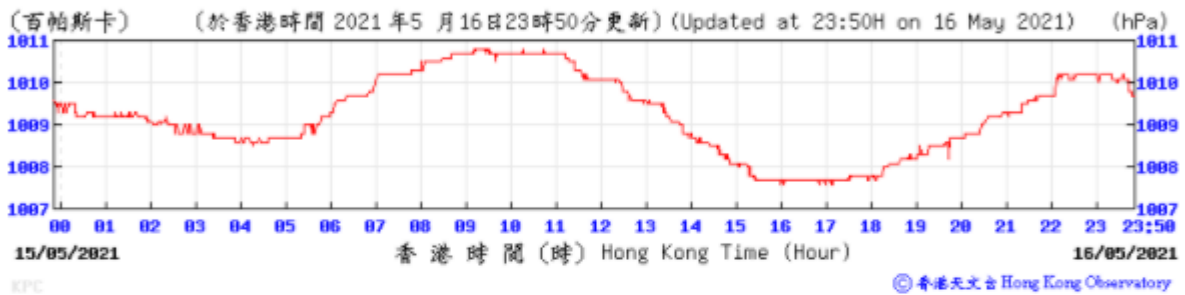
Wind Speed:



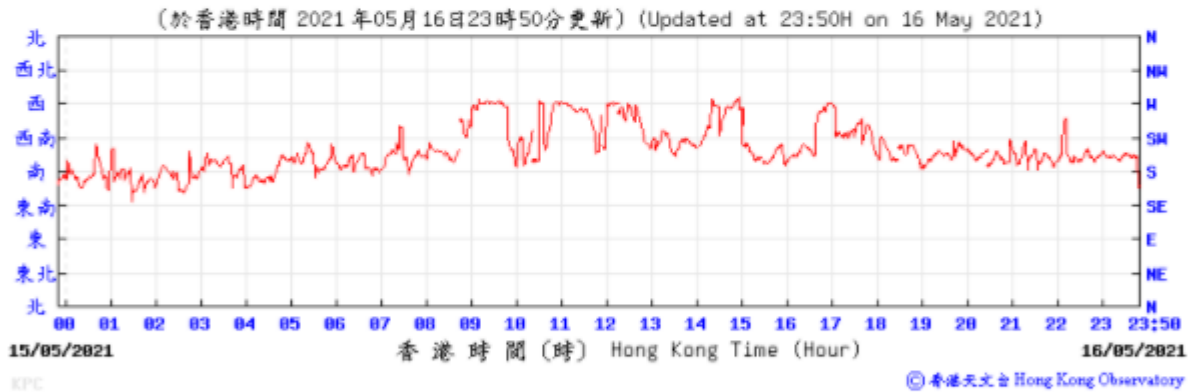
Temperature/Humidity:



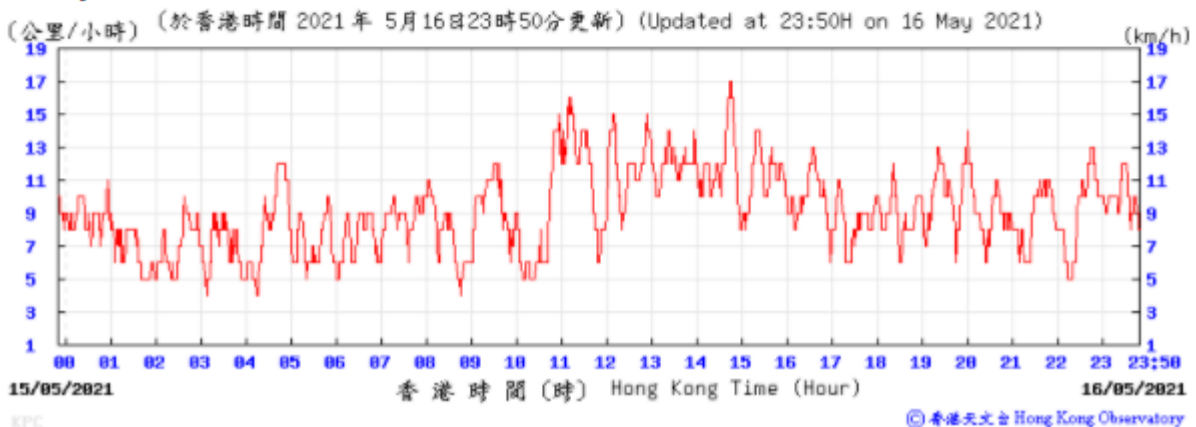
Pressure:



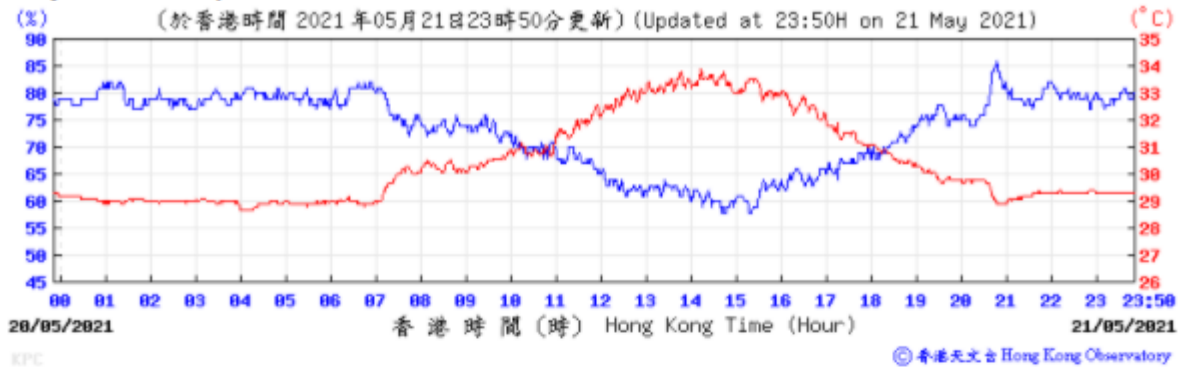
Wind Direction:



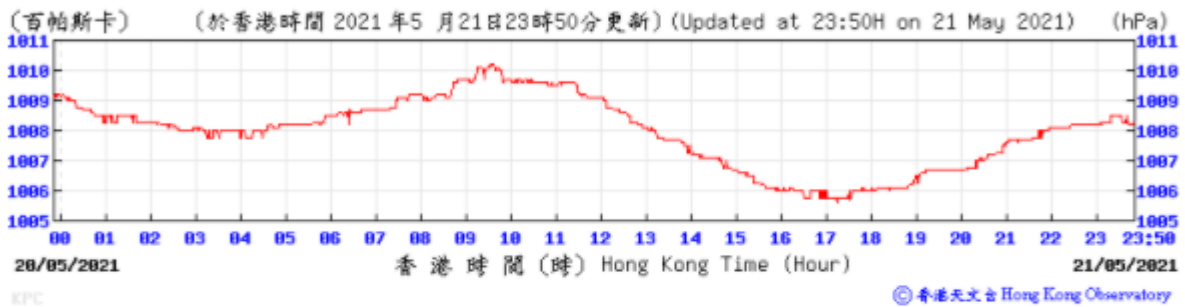
Wind Speed:



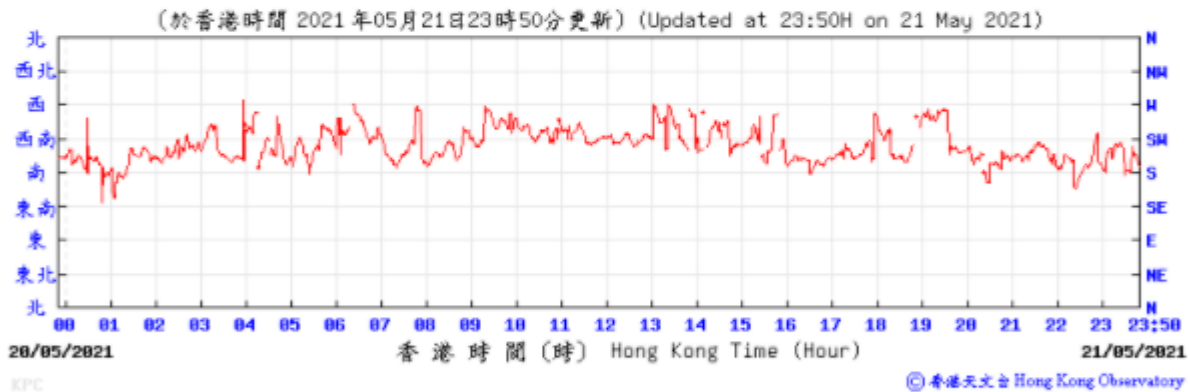
Temperature/Humidity:



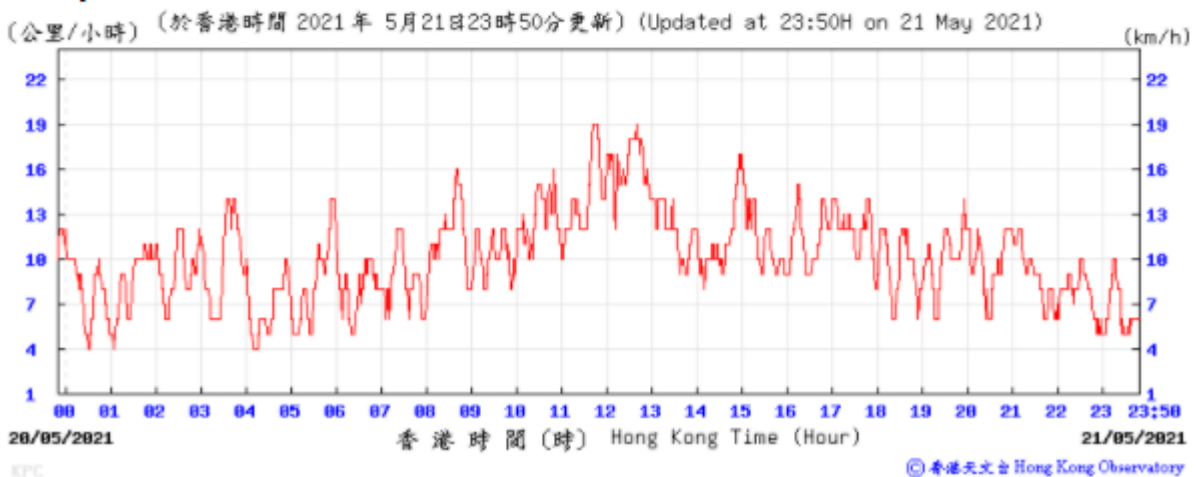
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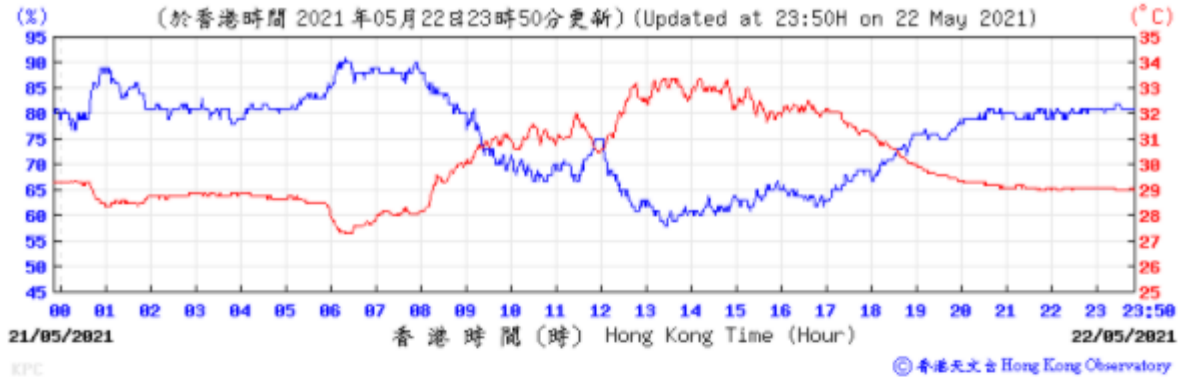
Wind Direction:



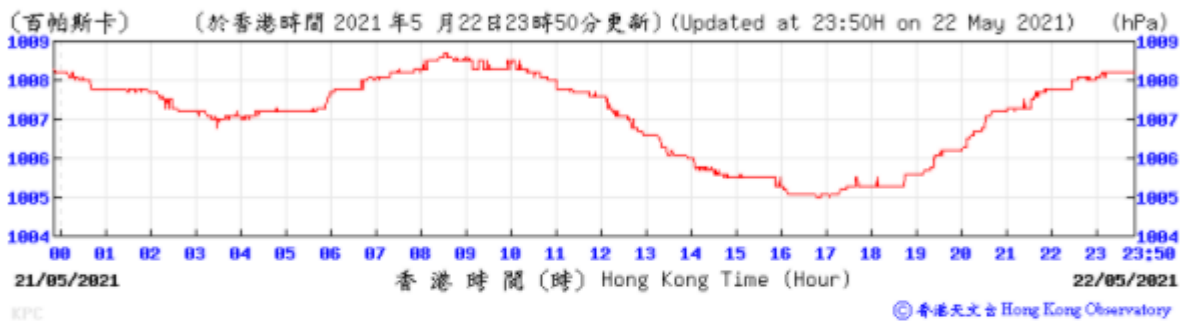
Wind Speed:



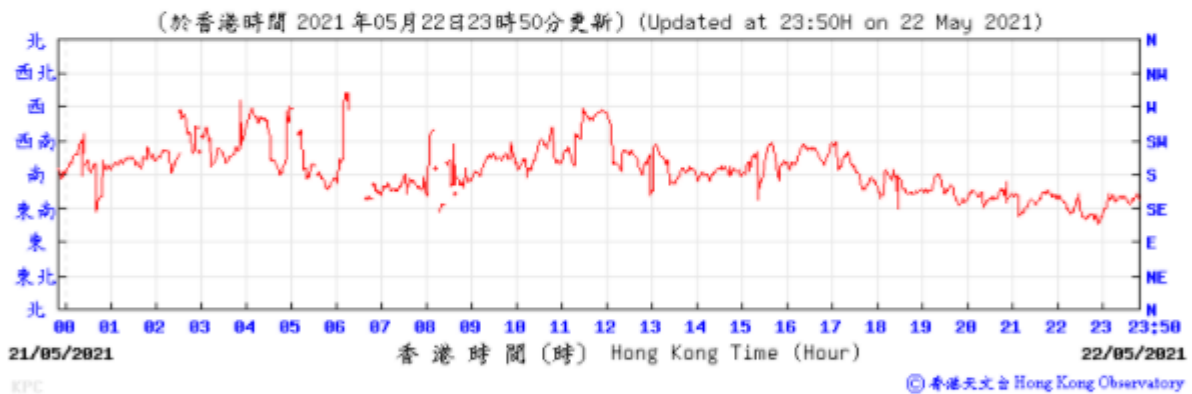
Temperature/Humidity:



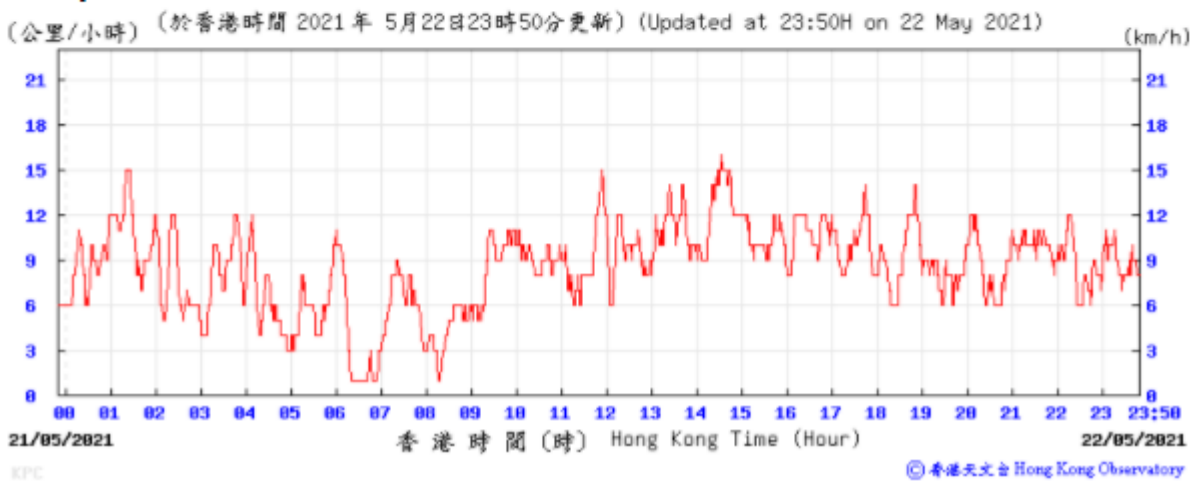
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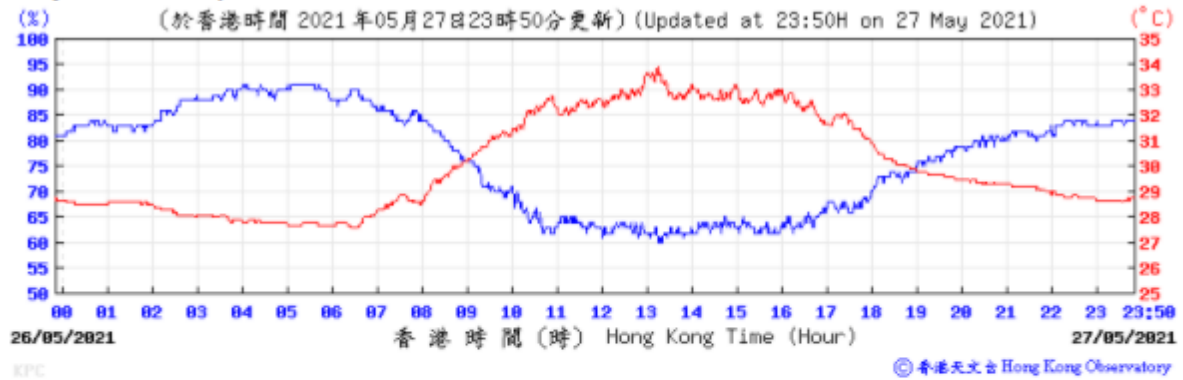
Wind Direction:



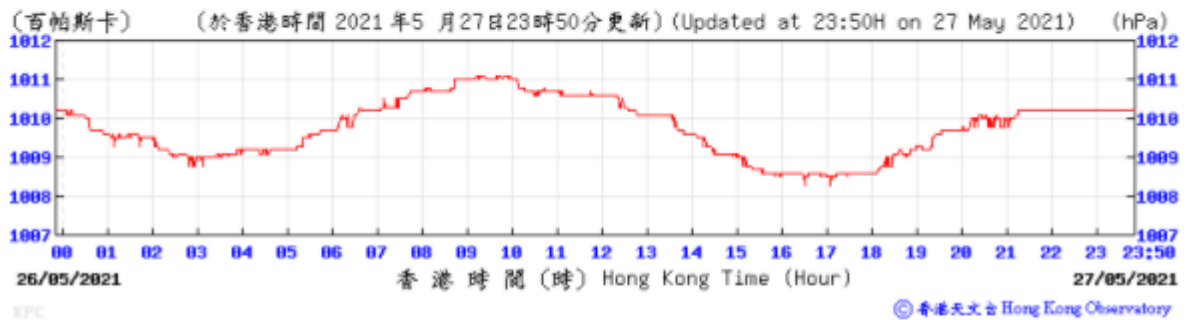
Wind Speed:



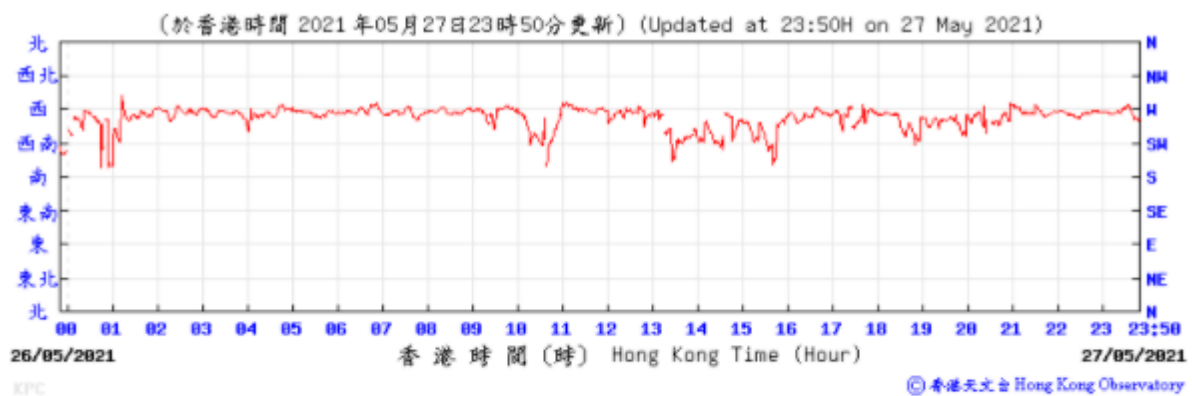
Temperature/Humidity:



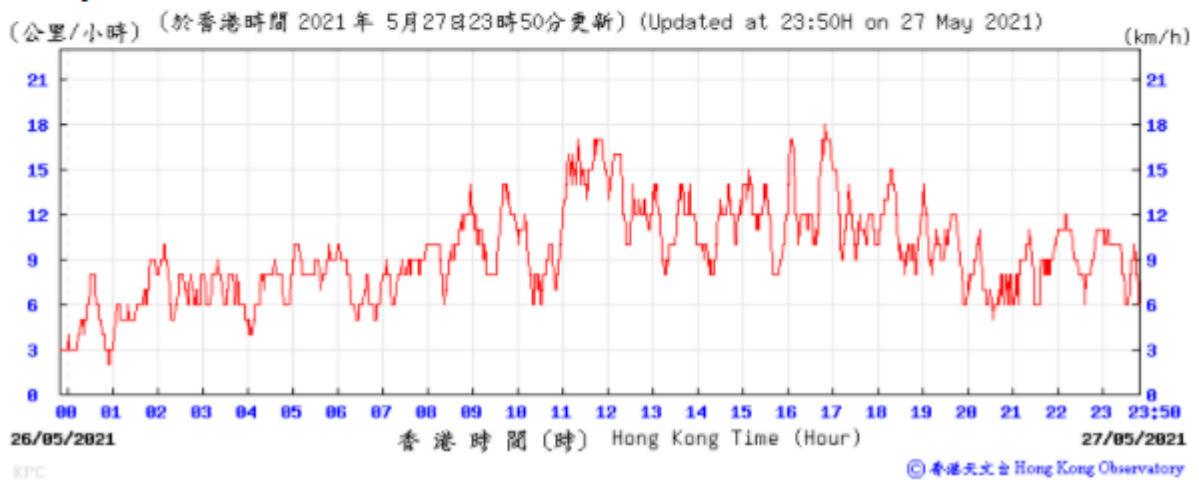
Pressure:



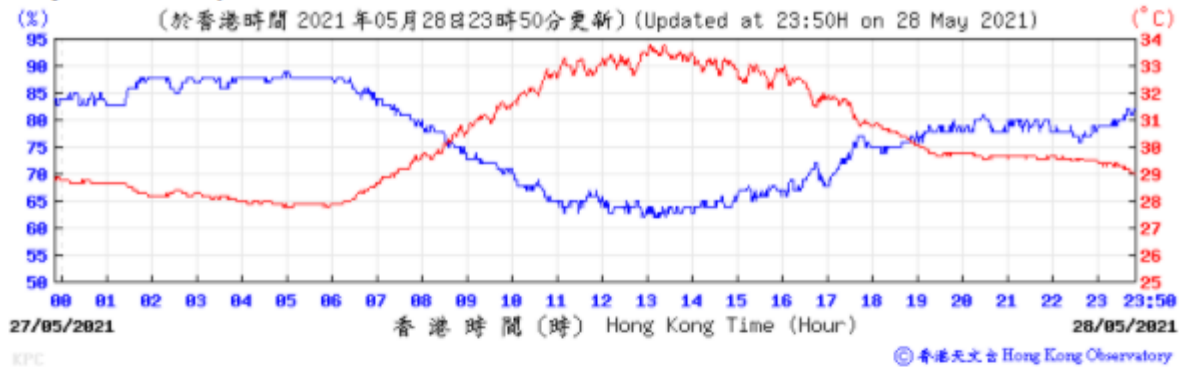
Wind Direction:



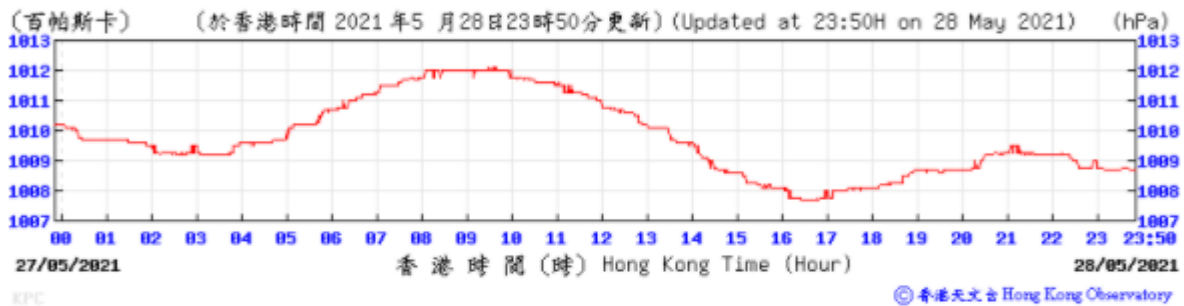
Wind Speed:



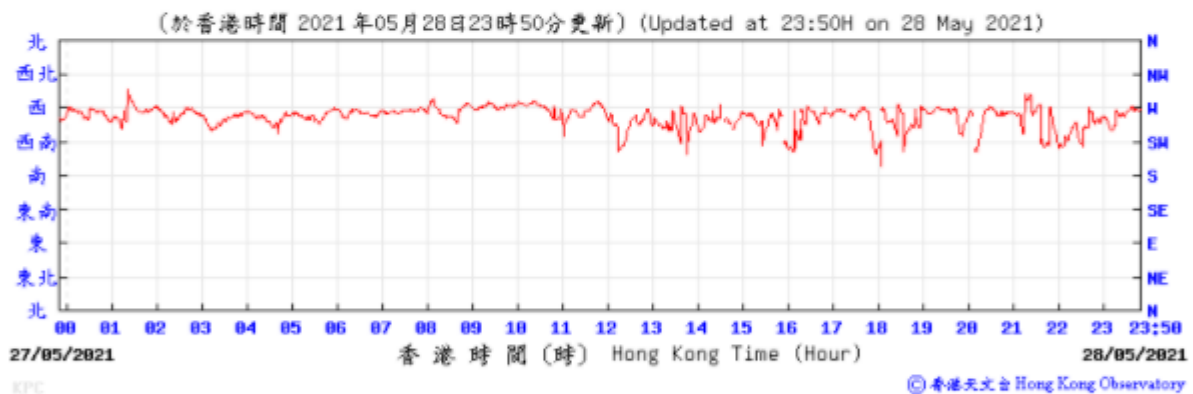
Temperature/Humidity:



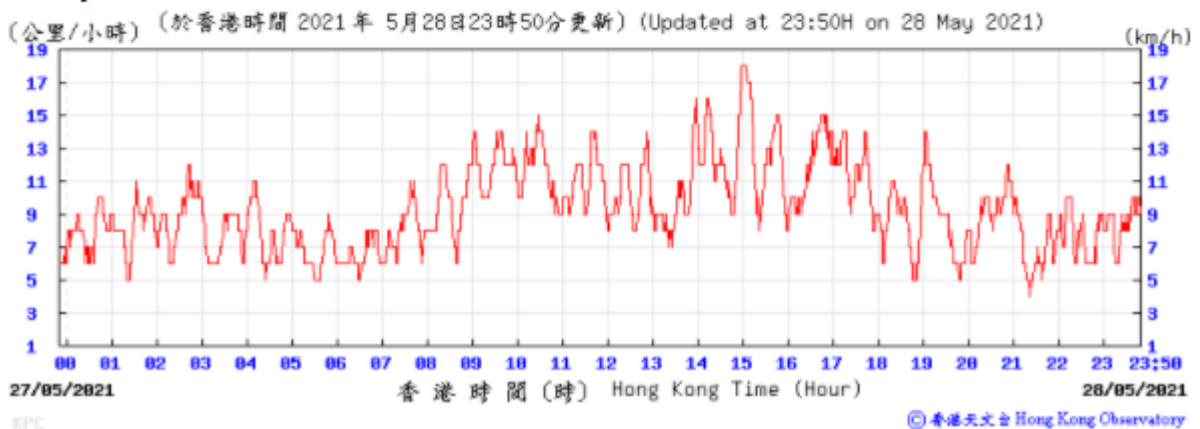
Pressure:



Wind Direction:



Wind Speed:



I. Waste Flow table

Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Disposed to Sorting Facility	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Wood/ Timber	Chemical Waste	Others, e.g. General Refuse
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)
2016													
Mar	2702.1	0.0	0.0	0.0	2702.1	0.0	0.0	4.5	0.1	0.0	0.0	0.0	30.6
Apr	8631.5	0.0	0.0	0.0	8631.5	0.0	0.0	16.0	0.0	0.0	0.0	0.0	19.2
May	12487.8	0.0	0.0	0.0	12487.8	0.0	0.0	34.0	0.0	0.0	0.0	0.7	60.5
Jun	8600.8	0.0	0.0	0.0	8600.8	0.0	0.0	31.4	0.2	0.0	0.0	0.5	13.5
Jul	12624.2	0.0	0.0	0.0	12624.2	0.0	0.0	19.6	0.0	0.0	0.0	2.0	9.9
Aug	14419.9	0.0	0.0	0.0	14419.9	0.0	0.0	43.9	0.0	0.0	0.0	0.0	11.1
Sep	13671.3	0.0	0.0	0.0	13671.3	0.0	0.0	59.8	0.0	0.0	0.0	1.6	12.4
Oct	13088.9	0.0	0.0	0.0	13088.9	0.0	0.0	36.9	0.2	1.5	0.0	0.0	15.2
Nov	12424.7	0.0	0.0	0.0	12424.7	0.0	0.0	74.7	0.0	0.0	0.0	1.4	10.2
Dec	12487.6	0.0	0.0	0.0	12487.6	0.0	0.0	13.9	0.0	0.0	0.0	1.3	9.0
Sub-total (2016)	111138.8	0.0	0.0	0.0	111138.8	0.0	0.0	334.5	0.4	1.5	0.0	7.6	191.6
2017													
Jan	9607.8	0.0	0.0	0.0	9607.8	0.0	0.0	29.5	0.0	0.0	0.0	0.0	7.3
Feb	9108.2	0.0	0.0	0.0	9108.2	0.0	0.0	50.2	0.2	0.0	0.0	0.7	9.8
Mar	11361.7	0.0	0.0	0.0	11361.7	0.0	0.0	16.1	0.0	0.0	0.0	1.4	8.5
Apr	2591.5	0.0	0.0	0.0	2591.5	0.0	0.0	35.7	0.0	0.0	0.0	0.0	4.7
May	2579.3	0.0	0.0	99.0	2480.3	0.0	0.0	20.9	0.1	0.0	0.0	0.5	10.0
Jun	476.0	0.0	0.0	341.0	129.7	5.3	0.0	0.0	0.0	0.0	0.0	0.0	7.6
Jul	3419.0	0.0	0.0	804.0	2615.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8
Aug	3730.9	0.0	0.0	1377.5	2353.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4
Sep	2108.2	0.0	0.0	1133.5	974.7	0.0	0.0	34.6	0.2	0.0	0.0	0.0	10.8
Oct	9159.0	0.0	0.0	7868.0	1291.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	9.3
Nov	5095.4	0.0	0.0	4352.0	725.2	18.1	0.0	0.0	0.0	0.0	0.0	0.0	38.8
Dec	3856.2	0.0	0.0	3076.0	780.2	0.0	0.0	0.0	0.2	0.0	0.0	0.4	8.4
Sub-total (2017)	63093.1	0.0	0.0	19051.0	44018.7	23.4	0.0	187.1	0.7	0.0	0.0	3.8	137.3

Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Disposed to Sorting Facility	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Wood/ Timber	Chemical Waste	Others, e.g. General Refuse
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)
2018													
Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Mar	6120.2	0.0	0.0	5782.0	338.2	0.0	0.0	0.0	0.0	1.0	0.0	0.5	17.6
Apr	14460.3	0.0	0.0	12484.1	1976.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0	7.6
May	59783.7	0.0	0.0	46989.0	12794.7	0.0	0.0	59.6	0.0	0.0	0.0	0.0	9.4
Jun	53117.5	0.0	0.0	37642.8	15474.7	0.0	0.0	51.5	0.2	0.0	0.0	0.0	12.8
Jul	89901.5	0.0	0.0	85317.1	4584.4	0.0	165.1	114.6	0.0	0.0	0.0	0.0	41.3
Aug	35137.3	0.0	0.0	33731.6	1405.7	0.0	214.3	148.1	0.0	0.0	0.0	0.0	48.5
Sep	4924.3	0.0	0.0	4641.2	196.1	87.0	174.6	40.0	0.0	0.0	0.0	0.0	179.2
Oct	19099.9	0.0	0.0	11301.0	7642.8	156.1	0.0	106.3	0.4	0.0	0.0	0.0	528.5
Nov	104168.0	0.0	0.0	79811.6	24351.0	5.3	0.0	54.5	0.0	0.6	0.0	0.0	31.5
Dec	62989.9	0.0	0.0	51284.4	11699.9	5.6	0.0	95.1	0.0	0.6	0.0	0.0	65.9
Sub-total (2018)	449702.6	0.0	0.0	368984.8	80463.7	254.0	553.9	669.7	0.5	2.4	0.0	0.5	943.7
2019													
Jan	74479.1	0.0	0.0	69249.5	5229.7	0.0	318.0	326.7	0.2	0.0	0.0	0.0	76.3
Feb	21969.9	0.0	0.0	17723.9	4246.0	0.0	16.5	55.2	0.0	0.0	0.0	0.0	26.7
Mar	19311.9	0.0	0.0	8569.9	10742.0	0.0	337.8	61.5	0.0	0.0	0.0	0.0	36.3
Apr	28559.9	0.0	0.0	21280.3	7279.6	0.0	0.0	32.6	0.0	0.8	0.0	0.0	24.9
May	45418.0	0.0	0.0	11200.6	34217.4	0.0	0.0	27.4	0.2	0.5	0.0	0.0	33.7
Jun	66633.4	0.0	0.0	23874.5	42748.0	10.9	59.2	11.9	0.0	0.9	0.0	0.0	35.3
Jul	36619.6	0.0	0.0	1632.7	34960.9	26.0	64.4	120.7	0.0	0.0	0.0	0.0	57.9
Aug	2526.8	0.0	0.0	0.0	2499.0	27.8	31.9	40.2	0.0	0.8	0.0	0.0	66.3
Sep	4117.6	0.0	0.0	0.0	4088.7	28.9	95.2	19.0	0.0	0.6	0.0	0.0	127.4
Oct	6974.2	0.0	0.0	0.0	6948.1	26.1	15.9	11.4	0.2	1.0	0.0	0.6	223.6
Nov	5334.4	0.0	0.0	0.0	5304.1	30.3	0.0	8.9	0.0	0.0	0.0	0.0	151.6
Dec	6236.8	0.0	0.0	0.0	6236.8	0.0	0.0	70.6	0.0	0.0	0.0	0.0	98.9
Sub-total (2019)	318181.6	0.0	0.0	153531.3	164500.1	150.1	938.9	785.8	0.6	4.6	0.0	0.6	959.0

Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Disposed to Sorting Facility	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Wood/ Timber	Chemical Waste	Others, e.g. General Refuse
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)
2020													
Jan	7089.9	0.0	0.0	0.0	7089.9	0.0	0.0	10.6	0.2	0.0	0.0	0.0	65.7
Feb	16822.3	0.0	0.0	0.0	16822.3	0.0	0.0	232.2	0.1	0.0	0.0	0.0	66.3
Mar	6559.0	0.0	0.0	0.0	6559.0	0.0	110.4	63.1	0.0	0.9	0.0	0.0	138.3
Apr	4997.9	0.0	0.0	1615.7	3382.2	0.0	159.2	1123.9	1.9	0.0	0.0	0.0	113.2
May	2236.0	0.0	0.0	452.3	1783.6	0.0	0.0	406.5	0.0	0.0	0.0	0.0	188.8
Jun	1134.3	0.0	0.0	0.0	1134.3	0.0	31.5	262.6	0.2	0.6	0.0	0.0	210.6
Jul	148.8	0.0	0.0	0.0	148.8	0.0	31.5	458.5	0.5	0.0	0.0	0.0	220.0
Aug	540.7	0.0	0.0	0.0	540.7	0.0	0.0	340.8	0.0	0.0	0.0	0.0	238.3
Sep	1432.3	0.0	0.0	0.0	1432.3	0.0	0.0	750.7	0.2	0.0	0.0	0.0	291.9
Oct	1381.5	0.0	0.0	0.0	1381.5	0.0	0.0	717.9	0.2	0.0	0.0	0.0	400.2
Nov	1444.1	0.0	0.0	0.0	1437.4	6.7	475.8	473.6	0.2	0.5	0.0	0.0	377.8
Dec	793.8	0.0	0.0	0.0	793.8	0.0	0.0	478.3	0.2	0.0	0.0	0.0	435.8
Sub-total (2020)	44580.6	0.0	0.0	2068.1	42505.8	6.7	808.3	5318.7	3.7	2.0	0.0	0.0	2746.8
2021													
Jan	881.4	0.0	0.0	0.0	881.4	0.0	0.0	835.1	0.4	0.0	0.0	0.0	497.0
Feb	544.7	0.0	0.0	0.0	544.7	0.0	0.0	100.5	0.3	0.0	0.0	0.0	504.7
Mar	406.1	0.0	0.0	0.0	406.1	0.0	0.0	455.8	0.3	0.0	0.0	0.0	881.8
Apr	633.0	0.0	0.0	0.0	633.0	0.0	0.0	429.9	0.7	0.0	0.0	0.0	613.0
May	1125.8	0.0	0.0	0.0	1125.8	0.0	0.0	0.0	0.0	0.1	0.0	0.0	355.3
Jun	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-total (2021)	3590.9	0.0	0.0	0.0	3590.9	0.0	0.0	1821.2	1.6	0.1	0.0	0.0	2851.7
Total	990287.5	0.0	0.0	543635.2	446218.0	434.3	2301.1	9116.9	7.5	10.5	0.0	12.5	7830.1

Note:

- 660.15 tonnes and 465.64 tonnes of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 Public Fill respectively in the reporting month.

J. Environmental Mitigation Measures – Implementation Status

Table J-1: Environmental Mitigation Measures Implementation Status (May 2021)

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
Air Quality Impact (Construction)			
2.1 & 10.3.1	General Dust Control Measures Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)	✓	✓
2.1 & 10.3.1	Best Practice For Dust Control The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: <i>Good Site Management</i> <ul style="list-style-type: none"> • Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. <i>Disturbed Parts of the Roads</i> <ul style="list-style-type: none"> • Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or • Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. <i>Exposed Earth</i> <ul style="list-style-type: none"> • Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seeding with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. <i>Loading, Unloading or Transfer of Dusty Materials</i>	Rem, Obs	Obs
		✓	✓
		✓	Obs
		N/A No exposed earth in this project.	N/A No exposed earth in this project.

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
	<ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. 	✓	✓
	<i>Debris Handling</i>		
	<ul style="list-style-type: none"> Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. 	Obs	✓
	<ul style="list-style-type: none"> Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. 	✓	✓
	<i>Transport of Dusty Materials</i>		
	<ul style="list-style-type: none"> Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. 	✓	✓
	<i>Wheel washing</i>		
	<ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. 	✓	✓
	<i>Use of vehicles</i>		
	<ul style="list-style-type: none"> The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. 	✓	✓
	<ul style="list-style-type: none"> Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. 	✓	✓
	<ul style="list-style-type: none"> Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. 	✓	✓
	<i>Site hoarding</i>		
	<ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. 	✓	✓
Best Practicable Means for Cement Works (Concrete Batching Plant)			

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
2.1 & 10.3.1	<p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include:</p> <p>Exhaust from Dust Arrestment Plant</p> <ul style="list-style-type: none"> Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection <p>Emission Limits</p> <ul style="list-style-type: none"> All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke <p>Engineering Design/Technical Requirements</p> <ul style="list-style-type: none"> As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions 	<p>N/A No concrete batching plant in this project.</p> <p>N/A No concrete batching plant in this project.</p> <p>N/A No concrete batching plant in this project.</p>	<p>N/A No concrete batching plant in this project.</p> <p>N/A No concrete batching plant in this project.</p> <p>N/A No concrete batching plant in this project.</p>
	<p>Non-Road Mobile Machinery (NRMM): All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels.</p>	Obs	✓
Noise Impact (Construction)			
3.1 & 10.4.1	<p>Good Site Practice Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction:</p> <ul style="list-style-type: none"> only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; mobile plant should be sited as far away from NSRs as possible; and 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
	<ul style="list-style-type: none"> material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. 	✓	✓
3.1 & 10.4.1	Adoption of Quieter PME The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "Sound Power Levels of Other Commonly Used PME" are presented in Table 4.26 in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.	✓	✓
3.1 & 10.4.1	Use of Movable Noise Barriers Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.	✓	✓
3.1 & 10.4.1	Use of Noise Enclosure/ Acoustic Shed The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010.	✓	✓
3.1 & 10.4.1	Use of Noise Insulating Fabric Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.	Obs	✓
3.1 & 10.4.1	Scheduling of Construction Works outside School Examination Periods During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods.	N/A No educational institutions nearby the site.	N/A No educational institutions nearby the site.
Water Quality Impact (Construction)			
Construction site runoff and drainage			

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
4.1 & 10.5.1	<p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. 	<p>✓</p> <p>Obs</p> <p>Rem</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>Rem</p> <p>✓</p> <p>✓</p>

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
	<ul style="list-style-type: none"> Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. 	✓	✓
	<ul style="list-style-type: none"> Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. 	✓	✓
	<ul style="list-style-type: none"> Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. 	✓	✓
	<ul style="list-style-type: none"> Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. 	N/A No bentonite slurries are used in this project.	N/A No bentonite slurries are used in this project.
	<p>Barging facilities and activities</p> <p>Recommendations for good site practices during operation of the proposed barging point include:</p>		
	<ul style="list-style-type: none"> All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; 	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	<ul style="list-style-type: none"> Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; 	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	<ul style="list-style-type: none"> All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and 	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	<ul style="list-style-type: none"> Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site. 	N/A No barging facilities in this project.	N/A No barging facilities in this project.

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
4.1 & 10.5.1	Sewage effluent from construction workforce Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	✓	✓
4.1 & 10.5.1	General construction activities <ul style="list-style-type: none"> Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event. 	✓ ✓	✓ Obs
Waste Management Implications (Construction)			
6.1 & 10.7.1	Good Site Practices Recommendations for good site practices during the construction activities include: <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site Training of site personnel in proper waste management and chemical handling procedures Provision of sufficient waste disposal points and regular collection of waste Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated 	✓ ✓ ✓ ✓ ✓	✓ Obs ✓ ✓

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
6.1 & 10.7.1	<p>Waste Reduction Measures</p> <p>Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> Sort inert C&D material to recover any recyclable portions such as metals Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force Proper site practices to minimise the potential for damage or contamination of inert C&D materials Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes 	<p>✓</p> <p>Rem</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
6.1 & 10.7.1	<p>Inert and Non-inert C&D Materials</p> <p>In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.</p> <ul style="list-style-type: none"> The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
	<ul style="list-style-type: none"> In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. 	✓	✓
6.1 & 10.7.1	<p>Chemical Waste</p> <ul style="list-style-type: none"> If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended. 	✓	✓
6.1 & 10.7.1	<p>General Refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	✓	✓
Land Contamination (Construction)			

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
7.1 & 10.8.1	<p>The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials.</p> <p>The following measures are proposed for excavation and transportation of contaminated material:</p> <ul style="list-style-type: none"> To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; Stockpiling of contaminated excavated materials on site should be avoided as far as possible; The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; Truck bodies and tailgates should be sealed to stop any discharge; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
	<ul style="list-style-type: none"> Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; Speed control for trucks carrying contaminated materials should be exercised; Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and Maintain records of waste generation and disposal quantities and disposal arrangements. 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
Ecological Impact (Construction)			
No mitigation measure is required.			
Landscape and Visual Impact (Construction)			
Table 9.1 & 10.8 (CM1)	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	✓	✓
Table 9.1 & 10.8 (CM2)	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	N/A Compensatory tree planting is being reviewed.	N/A Compensatory tree planting is being reviewed.
Table 9.1 & 10.8 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	N/A Roof garden is designed to be built, but it has not been completed yet.	N/A Roof garden is designed to be built, but it has not been completed yet.

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
Table 9.1 & 10.8 (CM4)	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	N/A Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location.	N/A Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location.
Table 9.1 & 10.8 (CM5)	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	N/A Roof garden is designed to be built, but it has not been completed yet.	N/A Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 & 10.8 (CM6)	Sensitive streetscape design should be incorporated along all new roads and streets.	N/A Greening along the seafront is proposed, but it has not been completed yet.	N/A Greening along the seafront is proposed, but it has not been completed yet.
Table 9.1 & 10.8 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	N/A Gardens are designed to be built, but it has not been completed yet.	N/A Gardens are designed to be built, but it has not been completed yet.
Table 9.1 & 10.8 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	N/A Roof garden is designed to be built, but it has not been completed yet.	N/A Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 (CM9)	Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody	N/A No marine facilities for this project.	N/A No marine facilities for this project.
Table 9.2 & 10.9 (MCP1)	Use of decorative screen hoarding/boards	✓	✓
Table 9.2 & 10.9 (MCP2)	Early introduction of landscape treatments	N/A No landscape treatments during this stage.	N/A No landscape treatments during this stage.
Table 9.2 & 10.9 (MCP3)	Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.	N/A No ventilation shafts for this project.	N/A No ventilation shafts for this project.
Table 9.2 & 10.9 (MCP4)	Control of night time lighting	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage	
		L1	L2
Table 9.2 & 10.9 (MCP5)	Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures.	N/A No temporary open areas for this project.	N/A No temporary open areas for this project.

- N/A - Not Applicable
- ✓ - Implemented
- Obs - Observed
- Rem - Reminder

K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works to the end of the reporting month are summarised in the **Table K-1** below respectively.

Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for Lyric Theatre Complex

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of summons	Successful prosecutions
This reporting month	3	0	0
From 1 March 2016 to end of the reporting month (May 2021)	22	0	0

END OF PART-1

Foundation, Excavation and Lateral Works for Integrated Basement and Underground Road in Zone 2A

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The information supplied and contained within this report is, to the best of our knowledge, correct at time of printing

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K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Executive summary

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A at WKCD, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073). The construction works and EM&A programme for Zone 2A commenced on 3 October 2020.

The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at Zone 2A from 1 to 31 May 2021.

Exceedance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise monitoring in this reporting month.

Implementation of Mitigation Measures

Construction phase weekly site inspections were carried out on 6, 13, 20 and 27 May 2021 for Foundation, Excavation and Lateral Support Works in Zone 2A to confirm the implementation measures undertaken by the Contractors in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the above mentioned weekly site inspections during the reporting month. No adverse comment on landscape and visual aspects was made during these inspections.

FEHD and EPD site inspection was conducted at Zone 2A project on 06 May 2021 and 28 May 2021 respectively.

Record of Complaints

Three environmental complaints were recorded in the reporting month.

Record of Notifications of Summons and Successful Prosecutions

No notifications of summons and successful prosecutions were recorded in the reporting month.

Future Key Issues

The major site works for Zone 2A scheduled to be commissioned in the coming month include:
Zone 2A-1

- Grouting Works (Trial 1)
 - Post Drilling
 - Install Pump Wells
 - Pumping Test
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - King Post & Erection of Steel Column for Working Platform
- Socketed H-Pile Works
 - Remaining Socket H-Pile Works
- Bored Pile Works
 - Bored Pile Construction

Zone 2A-2

- Bored Pile Works
 - Additional Bored Pile Construction
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - Stage 1a & 1b Grouting
 - Pipe Pile Construction

Potential environmental impacts due to the construction activities, including air, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

1 Introduction

1.1 Background

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A at WKCD, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073). The purpose of the development in Zone 2A is to reserve for Integrated Basement (IB) and Underground Road (UR). The Zone 2A construction activities involve the foundation, excavation and lateral support (ELS) works, road works, drainage diversion works, and temporary car parking. The construction works and EM&A programme for Zone 2A commenced on 3 October 2020.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary falls under this same category.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at Zone 2A from 1 to 31 May 2021. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

1.3 Construction Works Status in the Reporting Period

During the reporting period, construction works at Zone 2A undertaken include:

Zone 2A-1

- Grouting Works (Trial 1)
 - Post Drilling
- Grouting Works (Trial 2)
 - Pumping Test
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - King Post
- Bored Pile Works
 - Bored Pile Construction

Zone 2A-2

- Bored Pile Works
 - Additional Bored Pile Construction
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - Stage 1a & 1b Grouting
 - Pipe Pile Construction

The Construction Works Programme of Zone 2A is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1**. Please refer to **Table 4.2** on the status of the environmental licenses.

1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

1.4.1 EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1**.

Table 1.1: Summary of Impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies
Air Quality	24-Hours TSP	AM3-The Victoria Towers Tower 1	At least once every 6 days
	1-Hour TSP	AM3-The Victoria Towers Tower 1	At least 3 times every 6 days
	24-Hours TSP	AM4-Canton Road Government Primary School	At least once every 6 days
	1-Hour TSP	AM4-Canton Road Government Primary School	At least 3 times every 6 days
	24-Hours TSP	AM5-Topside Developments at West Kowloon Terminus Site	At least once every 6 days
	1-Hour TSP	AM5-Topside Developments at West Kowloon Terminus Site	At least 3 times every 6 days
Noise	Leq, 30 minutes	NM2-The Arch, Sun Tower	Weekly
	Leq, 30 minutes	NM3-The Victoria Towers Tower 1	Weekly
	Leq, 30 minutes	NM4-Canton Road Government Primary School	Weekly
	Leq, 30 minutes	NM5-Development next to Austin Station	Weekly
Landscape & Visual	Monitor implementation of proposed mitigation measures during the construction stage	As described in Table 9.1 and 9.2 of the EM&A Manual	Bi-Weekly

1.4.2 Alternative Monitoring Locations

The EM&A programme for the Project should require 5 noise monitoring station and 5 air quality monitoring stations located closest to the Project area. With regard to the monitoring activities at

M+ Museum and the Lyric Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring.

In the context of the construction activities in Zone 2A, all other monitoring locations including AM3 (The Victoria Towers Tower 1), AM4 (Canton Road Government Primary School), and AM5 (Topside Developments at West Kowloon Terminus Site) for air monitoring; and NM2 (The Arch, Sun Tower), NM3 (The Victoria Towers Tower 1), NM4 (Canton Road Government Primary School) and NM5 (Development next to Austin Station) for noise monitoring, have been taken into account. However, access to all these originally designated monitoring stations was declined as described below point-by-point.

The Arch management office and owners' committee have formally declined the proposal of setting up noise monitoring instrument on its premises at the podium level of Sun Tower (NM2) on 24 July 2014. Thus, alternative noise monitoring location was identified at the ground floor in front of The Arch – Sun Tower (NM2A), which is at the same location as stated in the EM&A Manual for consistency. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

The Victoria Towers management office formally declined the proposal of setting up air quality and noise monitoring instruments on its premises at the podium area of Tower 1 (AM3/NM3) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Northeast corner of West Kowloon Station's station box (AM3A), in the same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor in front of the Xiqu Centre (NM3A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

Canton Road Government Primary School formally declined the proposal of setting up air quality and noise monitoring instruments on its premise at the podium level (AM4/NM4) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Southeast corner of West Kowloon Station's station box (AM4A), in same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor next to Tsim Sha Tsui Fire Station (NM4A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

MTR also formally declined the access to the designated AM5 location (topside developments at West Kowloon Terminus Site) on 15 July 2020. Alternative air monitoring location was identified at ground floor at the North of West Kowloon Station's station box (AM5A), in same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020.

Grand Austin property management office formally declined our proposal of setting up noise monitoring instrument on its premises at the podium level (NM5) on 10 July 2020. Alternative

noise monitoring location was identified at the Pedestrian road (ground floor) outside West Kowloon Station (NM5A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

2 Impact Monitoring Methodology

2.1 Introduction

Air quality and noise monitoring methodology, including the monitoring locations, equipment used, parameters, frequency and duration etc., are described in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in **Appendix E**.

The relevant EM&A monitoring requirements and details for landscape and audit impact, are also presented in this Section.

2.2 Air Quality

2.2.1 Monitoring Parameters, Frequency and Duration

Table 2.1 summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration

Parameter	Frequency	Duration
24-hour TSP	At least once in every six-days	24 hours
1-hour TSP	At least 3 times every six-days	60 minutes

2.2.2 Monitoring Locations

Monitoring stations and locations are given in **Table 2.2** and shown in **Figure 1**.

Table 2.2: Air Quality Monitoring Station

Monitoring Station	Location Description
AM3A	Northeast corner of West Kowloon Station's station box (G/F)
AM4A	Southeast corner of West Kowloon Station's station box (G/F)
AM5A	North of West Kowloon Station's station box (G/F)

2.2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: TE-5170) located at the designated monitoring station. The HVS meets all the requirements stated in of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS, calibration kit and portable dust meters are attached in **Appendix F**.

Table 2.3: TSP Monitoring Equipment

Equipment	Model
24-hour TSP monitoring	
High Volume Sampler	TE-5170 (Serial No.: 4340; 3998; 4344)
Calibrator	TE-5025A (Orifice I.D.: 3543)

Equipment	Model
1-hour TSP monitoring	
Portable direct reading dust meter	Sibata LD-3B (Serial No.: 235811, 336338, 567188)

Calibration of the HVS (five-point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The 1-hour TSP monitoring should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

2.2.4 Monitoring Methodology

24-hour TSP Monitoring

Installation

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

Preparation of Filter Papers

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 µm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

Field Monitoring Procedures

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.

- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 m³/min. The range specified in the EM&A Manual was between 0.6-1.7 m³/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.
- Calibration records for HVS and calibration kit are shown in **Appendix F**.

1-hour TSP Monitoring

Field Monitoring

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push "START/STOP" to start the 1-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 1 hour.

Maintenance and Calibration

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

2.3 Noise

2.3.1 Monitoring Parameters, Frequency and Duration

Table 2.4 summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels L_{eq} , L_{10} and L_{90} are recorded in a 30-minute interval between 0700 and 1900 hours.

Table 2.4: Noise Monitoring Parameters, Period and Frequency

Time Period	Parameters	Frequency
Daytime on normal weekdays (0700-1900 hours)	L_{eq} (30 min), L_{90} (30 min) & L_{10} (30 min)	Once every week

Note: *70 dB(A) for schools and 65 dB(A) during school examination periods.

If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

2.3.2 Monitoring Location

Noise monitoring stations and locations are given in **Table 2.5** and shown in **Figure 1**.

Table 2.5: Noise Monitoring Station

Monitoring Station	Location
NM2A	The Arch – Sun Tower (G/F)
NM3A	Xiqu Centre (G/F)
NM4A	Next to Tsim Sha Tsui Fire Station (G/F)
NM5A	Pedestrian road (G/F) outside West Kowloon Station

2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{Aeq}) and percentile sound pressure level (L_x). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

Table 2.6: Noise Monitoring Equipment

Equipment Model	
Integrating Sound Level Meter	Calibrator
AWA5661 (Serial No.: 301135)	Pulsar 100B (Serial No.: 039507)

2.3.4 Monitoring Methodology

Field Monitoring

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at NM5A monitoring location.
- The battery condition was checked to ensure the correct functioning of the meter.

- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting: A
 - time weighting: Fast
 - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

2.4 Landscape and Visual

2.4.1 Monitoring Program

Table 2.7 details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase

Stage	Monitoring Task	Frequency	Report	Approval
Construction	Monitor implementation of proposed mitigation measures during the construction stage.	Bi-weekly	ET to report on Contractor's compliance	Counter-signed by IEC

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.

3 Monitoring Results

3.1 Impact Monitoring

Air quality, noise and landscape and visual impact monitoring was undertaken in compliance with the EM&A Manual during the reporting month.

3.2 Air Quality Monitoring

3.2.1 1-hour TSP

Results of 1-hour TSP are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

Table 3.1: Summary of 1-hour TSP monitoring results

Monitoring Station	Monitoring Date	Start Time	1-hour TSP ($\mu\text{g}/\text{m}^3$)			Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1st Result	2nd Result	3rd Result			
AM3A	05-May-21	8:01	48	45	50	32-50	280.4	500
	11-May-21	14:03	41	35	39			
	17-May-21	8:02	36	40	43			
	22-May-21	14:05	42	46	38			
	28-May-21	8:10	37	32	40			
AM4A	05-May-21	8:09	46	51	49	34-51	278.5	500
	11-May-21	14:11	41	38	36			
	17-May-21	8:10	40	37	42			
	22-May-21	14:13	45	40	43			
	28-May-21	8:18	34	39	36			
AM5A	05-May-21	8:24	50	47	52	34-52	275.4	500
	11-May-21	14:28	34	40	37			
	17-May-21	8:25	41	44	39			
	22-May-21	14:30	41	44	39			
	28-May-21	8:33	38	41	35			

3.2.2 24-hour TSP

Results of 24-hour TSP are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

Table 3.2: Summary of 24-hour TSP monitoring results

Monitoring Station	Monitoring Date	Start Time	Monitoring Results ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM3A	05-May-21	10:00	45.2	33.0-45.2	152.4	260
	11-May-21	10:00	34.1			
	17-May-21	10:00	37.0			
	22-May-21	10:00	39.6			

Monitoring Station	Monitoring Date	Start Time	Monitoring Results ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM4A	28-May-21	10:00	33.0	32.2-46.4	152.6	260
	05-May-21	10:00	46.4			
	11-May-21	10:00	35.6			
	17-May-21	10:00	37.1			
	22-May-21	10:00	39.1			
AM5A	28-May-21	10:00	32.2	37.5-45.4	141.1	260
	05-May-21	10:00	45.4			
	11-May-21	10:00	38.0			
	17-May-21	10:00	38.7			
	22-May-21	10:00	41.3			
	28-May-21	10:00	37.5			

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

3.3 Noise Monitoring

The construction noise monitoring results are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up as façade and free-field measurements are shown in **Appendix G**.

Table 3.3: Summary of noise monitoring results during normal weekdays

Monitoring Stations	Monitoring Date	Start Time	End Time	L_{eq} (30 mins) dB(A)	Limit Level for L_{eq} (dB(A))
NM2A	05-May-21	08:31	09:01	58.6	75
	11-May-21	14:33	15:03	58.8	
	17-May-21	08:32	09:02	59.0	
	22-May-21	14:35	15:05	59.7	
	28-May-21	08:40	09:10	58.7	
NM3A	05-May-21	10:01	10:31	69.9	75
	11-May-21	16:06	16:36	70.0	
	17-May-21	10:02	10:32	68.8	
	22-May-21	16:08	16:38	69.9	
	28-May-21	10:10	10:40	70.2	
NM4A	05-May-21	10:36	11:06	67.7	70/65 [#]
	11-May-21	16:41	17:11	68.4	
	17-May-21	10:37	11:07	68.5	
	22-May-21	16:43	17:13	68.0	
	28-May-21	10:45	11:15	67.8	
NM5A*	05-May-21	09:21	09:51	66.2	75
	11-May-21	15:25	15:55	65.7	
	17-May-21	09:22	09:52	65.6	
	22-May-21	15:27	15:57	67.0	
	28-May-21	09:30	10:00	66.1	

Remarks:

* +3dB (A) correction was applied to free-field measurement.

[^] 70 dB(A) for schools and 65 dB(A) during school examination periods.

[#] No school examination was conducted during the reporting period.

No exceedance (Action or Limit Level) of construction noise was recorded in the reporting period.

Construction works were extended to 1900-2200 hours on 03 to 08, 10 to 15, 17 to 18, 20 to 22, 24 to 29 and 31 May 2021; 2300-0700 hours on 13 to 15, 17 to 18 and 20 to 22 May 2021; and to holidays 0900-2300 hours on 02, 16, 19 and 23 May 2021; 2300-0700 hours on 16, 19 and 23 May 2021. In accordance with the EM&A Manual, additional monitoring was carried out during the restricted hours on 02, 05, 11, 16, 17, 19, 22, 23 and 28 May 2021. The L_{eq} (5 mins) is in the range of 50.6-69.6 dB(A). Construction Noise Permits for the works carried out during restricted hours were obtained and listed in **Table 4.2**.

3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 13 and 27 May 2021 for Zone 2A during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during these inspections.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

4 Site Environmental Management

4.1 Site Inspection

Construction phase weekly site inspections were carried out on 06, 13, 20 and 27 May 2021. The joint site inspection with IEC, ET, ER and Contractor was held on 27 May 2021. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

FEHD inspection was conducted at Zone 2A project on 06 May 2021. No adverse comments or prosecution was given.

EPD inspection was conducted at Zone 2A project on 28 May 2021. No adverse comments or prosecution was given. Verbal reminder was provided that dust control should be provided for main haul road and ensure no untreated water is discharge into the sea.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.1**.

Table 4.1: Summary of Site Inspections and Recommendations for Zone 2A

Inspection Date	Parameter	Observation / Recommendation	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
06-May-21	Air Quality	The contractor was reminded to check/maintain the plant regularly to minimize generation of dark smoke emission.	The contractor has checked the plant and changed the diesel filter to minimize generation of dark smoke emission.	07-May-21
06-May-21	Water Quality	The contractor was reminded that the U-channel should maintain clean to ensure proper function.	The contractor has cleaned and maintained the U-channel to ensure proper function.	08-May-21
06-May-21	Noise	The contractor was recommended to provide more noise barrier to minimise noise impact to the nearby residents.	The contractor has erected more noise barrier to minimise noise impact to the nearby residents.	10-May-21
13-May-21	Air Quality	The contractor was reminded that the idle dusty stockpile should be fully covered by tarpaulin / removed from site.	The contractor has removed the stockpile from site.	14-May-21
13-May-21	Water Quality	The contractor was reminded to move away the dusty stockpile from the U-channel to prevent dusty material washed into the drainage system.	The contractor has moved away the dusty stockpile from the U-channel.	15-May-21
20-May-21	Air Quality	The contractor was reminded to provide water spray on dusty haul road regularly.	The contractor has provided water spray on dusty haul road regularly.	20-May-21
20-May-21	Noise	The contractor was reminded to minimise gap between noise barrier as much as possible to screen noise effectively.	The contractor has minimized the gap between noise barrier as much as possible to screen noise effectively.	21-May 21

Inspection Date	Parameter	Observation / Recommendation	Contractor's Responses / Action(s) Undertaken	Close-out (Date)
27-May-21	Air Quality	The contractor was reminded to provide water spray on dusty haul road regularly.	The contractor has provided water spray on dusty haul road regularly.	27-May-21
27-May-21	Air Quality	The contractor was reminded to check/maintain the plant regularly to minimize generation of dark smoke emission.	The contractor has checked the plant and changed the diesel filter to minimize generation of dark smoke emission.	28-May-21
27-May-21	Water Quality	The contractor was reminded to clean the wastewater treatment facility regularly to maintain water quality in good condition.	The contractor has provide regularly cleaning for the wastewater treatment facility.	28-May-21

4.2 Advice on the Solid and Liquid Waste Management Status

The Contractors have been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Contractor, 247.92 tonnes, 5874.80 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, and Tuen Mun Area 38 Public Fill respectively, while 18.43 tonnes of general refuse were disposed of at SENT landfill. 125.49 tonnes of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastics and 0.0 tonne of timber was collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material was reused on site. 1853.51 tonnes of inert C&D material were reused in other projects and 0.0 tonne of inert C&D material was imported for reuse at site in the reporting month. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.20 tonnes of chemical waste was collected by licensed contractors in the reporting period.

The cumulative waste generation records for Zone 2A are shown in **Appendix I**.

4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.2**.

Table 4.2: Status of Environmental Submissions, Licenses and Permits for Zone 2A

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Chemical Waste Producer Registration				
WPN5113-256-B2597-01	10-Sep-20	--	Valid	--
Billing Account Construction Waste Disposal				
7037500	09-Jun-20	--	Account Active	--
Construction Noise Permit				
GW-RE-0159-21	11-Mar-21	10-Jul-21	Valid	Piling Works
Wastewater Discharge License				
WT00037344-2021	01-Feb-21	28-Feb-26	Valid	--
Notification under Air Pollution Control (Construction Dust) Regulation				

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
456376	21-May-20	--	Notified	--
Permit to Dump Material at sea under Dumping at Sea Ordinance				
461895	--	--	Under EPD Approval	--

4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

Air Quality

- Maintain water spraying for active construction area and main haul road.
- Idle stockpile should be fully covered when not in use or removed from the site.
- Plant/equipment shall check regularly to minimise dark smoke emission.

Noise Control

- Provide more noise barrier to minimise construction noise impact to the nearby noise sensitive receiver.
- Gap between noise barrier should minimize as much as possible to screen noise effectively.

Temporary Water Drainage System & Water Quality

- The temporary drainage system should be well managed and updated with the site condition.
- U-channel should be cleaned regularly.
- The water treatment facilities should be cleaned regularly to maintain proper function.
- Dusty stockpile should keep away from U-channel to prevent dusty material wash into the drainage system.

5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

Table 5.1: Status of Submissions under the Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report for April 2021	14 May 2021

6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

6.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise in this reporting month (the noise related environmental complaint received in the reporting month was not relating to Zone 2A construction site).

6.2 Record on Environmental Complaints Received

Three environmental complaints (not related to Zone 2A) were recorded in the reporting month.

On 11 May 2021, WKCD has received a complaint from the office of Mr. Derek Hung (YTMDC member) about the noise from WKCD site. The resident of Harbourside found that noise was generated from nearby construction site on Sunday 9 May 2021. After carrying out the investigation with the contractors, no construction works were undertaken on 9 May 2021 (Sunday) on WKCD Zone 2A site. Thereby, the complaint might not be attributable to the Zone 2A site. However, the contractor is recommended to strictly maintain the noise mitigation measures on site to reduce impacts to nearby residents.

The other environmental complaint was referred by EPD on 11 May 2021. Referring to the pictures provided by the complainant (a nearby resident), pollutant was spotted at the waterbody of Victoria Harbour near WKCD construction site between 7 May 2021 and 9 May 2021. After carrying out the investigation with the contractors, no abnormalities were found at the seafront of Victoria Harbour on 7 and 8 May 2021, and no construction works were undertaken by WKCD Zone 2A site on 9 May 2021. Thereby, the complaint could not be attributable to Zone 2A site. However, the contractor is recommended to strictly maintain good site practices to avoid muddy water flowing into to the waterbody of Victoria Harbour.

The third environmental complaint was referred by EPD on 12 May 2021. Referring to the picture provided by the complainant (a resident of Harbourside), pollutant was spotted at the waterbody of Victoria Harbour near WKCD construction site on 9 May 2021. After carrying out the investigation with the contractors, no construction works were undertaken by WKCD Zone 2A site on 9 May 2021. Thereby, the complaint might not be attributable to the Zone 2A site. However, the contractor is recommended to strictly maintain good site practices to avoid muddy water flowing into to the waterbody of Victoria Harbour.

The cumulative statistics on complaints were provided in **Appendix K**.

6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

7 Future Key Issues

7.1 Construction Works for the Coming Month(s)

Zone 2A-1

- Grouting Works (Trial 1)
 - Post Drilling
 - Install Pump Wells
 - Pumping Test
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - King Post & Erection of Steel Column for Working Platform
- Socketed H-Pile Works
 - Remaining Socket H-Pile Works
- Bored Pile Works
 - Bored Pile Construction

Zone 2A-2

- Bored Pile Works
 - Additional Bored Pile Construction
- ELS (Stage 1) – Grouting / Pipe Pile Works
 - Stage 1a & 1b Grouting
 - Pipe Pile Construction

7.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from piling works;
- Generation of site surface runoffs and wastewater from activities on-site;
- The temporary drainage system should be well managed and updated with the site condition, particularly on rainy days;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. Impact monitoring for air quality and noise in accordance with the approved EM&A Manual has commenced since 3 October 2020 for Zone 2A. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

8 Conclusions and Recommendations

8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken with the commencement of the construction activities at Zone 2A on 3 October 2020.

Monitoring of air quality and noise with respect to the Projects is underway. In particular, the 1-hour TSP, 24-hour TSP, noise level (as L_{eq} , 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise monitoring in this reporting month.

Three environmental complaint was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

Figure 1 Site Layout Plan and Monitoring Stations

Appendices

- A. Project Organisation
- B. Tentative Construction Programme
- C. Action and Limit Levels for Construction Phase
- D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
- E. Monitoring Schedule
- F. Calibration Certifications
- G. Graphical Plots of the Monitoring Results
- H. Meteorological Data Extracted from Hong Kong Observatory
- I. Waste Flow table
- J. Environmental Mitigation Measures – Implementation Status
- K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

A. Project Organisation

Project Organization

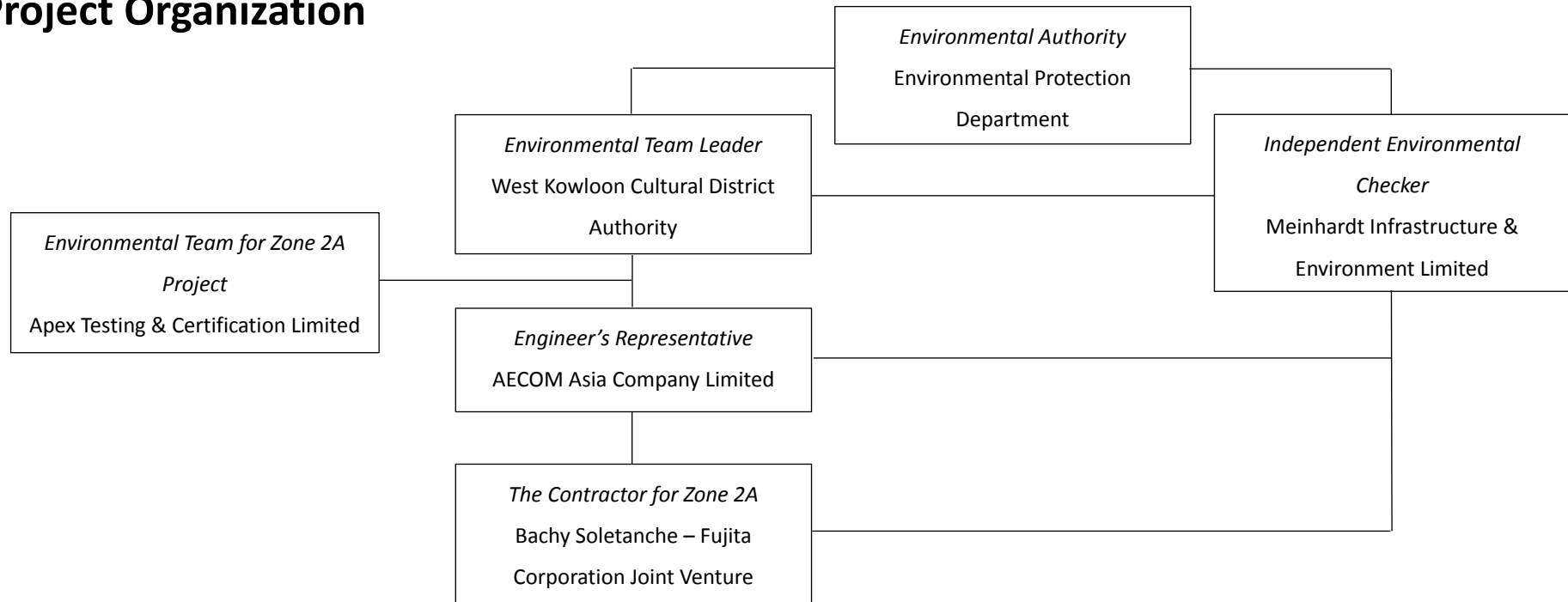


Table A-1: Contract Information

Company Name	Role	Name	Telephone	Email
West Kowloon Cultural District Authority	WKCDA Representative & Project ETL	Mr. C.K. WU	5506 9178	ck.wu@wkcd.a.hk
Meinhardt Infrastructure & Environment Limited	Independent Environmental Checker	Ms. Claudine LEE	2859 5409	caludinelee@meinhardt.com.hk
AECOM Asia Company Limited	Resident Engineer	Mr. Alex GBAGUIDI	3619 6287	alex.gbaguidi@aecom.com
Bachy Soletanche – Fujita Corporation Joint Venture	Quality, Safety, Health & Environmental Manager	Mr. Vincent CHAN	9733 7310	Chuen.Kwok.CHAN@soletanche-bachy.com
Bachy Soletanche – Fujita Corporation Joint Venture	Environmental Engineer	Mr. William CHAN	54083045	william-hou.chan@soletanche-bachy.com
Apex Testing & Certification Limited	Contractor's Environmental Team Leader	Mr. Calvin LUI	9629 9718	calvinlui@apextestcert.com

B. Tentative Construction Programme

Project Name: Foundation and ELS Works for Integrated Basement and Underground Road in Zone 2A of the West Kowloon Cultural District

3-Month Rolling Programme

Activity Description	Duration (Cal. Day)	Start Date	Finish Date	2021											
				May				June				July			
				7	14	21	28	4	11	18	25	2	9	16	23
W52	W53	W54	W55	W56	W57	W58	W59	W60	W61	W62	W63	W64			
Zone 2A-1 Foundation, ELS Works and Blinding to Formation (KD01)															
Grouting Works (Trial 1)															
Post Drilling	55	22-Apr-21	15-Jun-21	■				■							
Install Pump Wells	8	16-Jun-21	23-Jun-21					■							
Pumping Test	7	24-Jun-21	30-Jun-21									■			
Grouting Works (Trial 2)															
Pumping Test	8	14-May-21	21-May-21	■											
ELS (Stage 1) - Grouting / Pipe Pile Works															
King Post (3/65 Nos Completed) & Erection of Steel Column for Working Platform (0/41 Nos completed)	145	15-May-21	6-Oct-21					■							
Socketed H-Pile Works															
Remaining Socketed H-Pile Works (0/53 Nos completed)	111	5-Jun-21	23-Sep-21					■							
Bored Pile Works															
Bored Pile Construction (Total 32 Nos. 2~4 Workfront)															
BP31L, BP33L, BP34I1, BP34G, BP31P, BP36F1, BP31R, BP33G, BP31M, BP36E1, BP31Q, BP33J, BP33M, BP32P, BP34F, BP35F1, BP33P, BP34K, BP34P, BP33F, BP35I1, BP34D, BP32D, BP36J1) (20 Nos. Cast; 1 Nos. completed RCD; 2 Nos. RCD in progress)	260	9-Nov-20	26-Jul-21	■				■							
Zone 2A-2 Foundation, ELS Works and Blinding to Formation (KD02)															
Bored Pile Works															
Additional Bored Pile Construction (Total 16 Nos.) BP15Y, BP16TA, BP13U, BP14Y, BP12M, BP12T, BP20XA, BP12Y, BP13Y, BP16WA (3 Nos. Cast; 1 Nos. completed RCD; 5 Nos. RCD in progress)	182	23-Mar-21	20-Sep-21	■				■							
ELS (Stage 1) - Grouting / Pipe Pile Works															
King Post (0/86 Nos Completed)	104	20-Oct-21	31-Jan-22												
Stage 1a & 1b grouting (715/1058 Nos Completed)	385	22-Oct-20	10-Nov-21	■				■							
Pipe Pile Construction (155/523 Nos Completed)	385	17-Nov-20	6-Dec-21	■				■							

- - Actual
- - Remaining Works
- - Critical Remaining Works

C. Action and Limit Levels for Construction Phase

Air Quality

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring stations are presented in following tables:

Table C-1: Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM3A	280.4	500
AM4A	278.5	500
AM5A	275.4	500

Table C-2: Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
AM3A	152.4	260
AM4A	152.6	260
AM5A	141.1	260

Noise

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

Table C-3: Action and Limit Levels for Construction Noise

Time Period & Monitoring Locations	Action Level	Limit Level
NM2A, NM3A, NM4A and NM5A		
0700-1900 hours on normal weekdays	When one valid documented complaint is received from any one of the sensitive receiver	75

Note:

*Reduce to 70dB(A) for school and 65 dB(A) during school examination period.

D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact

Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D-1: Typical Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	WKCD	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and WKCD; 3. Advise the WKCD on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCD; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to WKCD within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET	IEC	WKCDA	Contractor
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCDA, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCDA on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.

Construction Noise

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

Table D-2: Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	WKCDA	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA until the exceedance is abated.

Landscape and Visual Impact

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

Table D-3: Event and Action Plan for Landscape and Visual Impact

Event	Action			
	Action	Event	Action	Event
Design Check	<ol style="list-style-type: none"> 1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report; 2. Prepare and submit report. 	<ol style="list-style-type: none"> 1. Check report submitted by ET; 2. Recommend remedial design if necessary. 	<ol style="list-style-type: none"> 1. Undertake remedial design if necessary. 	-
Non-conformity on one occasion	<ol style="list-style-type: none"> 1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed. 	<ol style="list-style-type: none"> 1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions. 	<ol style="list-style-type: none"> 1. Notify Contractor; 2. Ensure remedial actions are properly implemented. 	<ol style="list-style-type: none"> 1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	<ol style="list-style-type: none"> 1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal. 	<ol style="list-style-type: none"> 1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions. 	<ol style="list-style-type: none"> 1. Notify Contractor; 2. Ensure remedial actions are properly implemented. 	<ol style="list-style-type: none"> 1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.

E. Monitoring Schedule

Notes:

- AM3A - Northeast corner of West Kowloon Station's station box (G/F)
- AM4A - Southeast corner of West Kowloon Station's station box (G/F)
- AM5A - North of West Kowloon Station's station box (G/F)
- NM2A - The Arch – Sun Tower (G/F)
- NM3A - Xiqu Centre (G/F)
- NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
- NM5A - Pedestrian road (G/F) outside West Kowloon Station

May 2021 (Hong Kong)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	1 ● Labour Day
2	3	4	5 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	6	7	8
9 Mother's Day	10	11 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	12	13 Landscape & Visual Inspection	14	15
16	17 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	18	19 ● Buddha's Birthday	20	21	22 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring
23	24	25	26	27 Landscape & Visual Inspection	28 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	29
30	31	1	2	3	4	5

Notes:

- AM3A - Northeast corner of West Kowloon Station's station box (G/F)
- AM4A - Southeast corner of West Kowloon Station's station box (G/F)
- AM5A - North of West Kowloon Station's station box (G/F)
- NM2A - The Arch – Sun Tower (G/F)
- NM3A - Xiqu Centre (G/F)
- NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
- NM5A - Pedestrian road (G/F) outside West Kowloon Station

June 2021 (Hong Kong)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	4	5
6	7	8	9 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	10 Landscape & Visual Inspection	11	12
13	14 ● Dragon Boat Festival	15 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	16	17	18	19
20 Father's Day	21 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	22	23	24 Landscape & Visual Inspection	25	26 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring
27	28	29	30	1 ● Hong Kong Special Administrative Region Establishment Day	2	3

F. Calibration Certifications

Certificate of Calibration

Calibration Certification Information			
Cal. Date: November 2, 2020	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 756.7	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 3543		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4310	3.2	2.00
2	3	4	1	1.0110	6.4	4.00
3	5	6	1	0.9000	8.0	5.00
4	7	8	1	0.8560	8.9	5.50
5	9	10	1	0.7100	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
1.0049	0.7022	1.4207	0.9958	0.6959	0.8815
1.0006	0.9897	2.0091	0.9915	0.9808	1.2467
0.9985	1.1094	2.2463	0.9894	1.0994	1.3938
0.9973	1.1651	2.3559	0.9882	1.1545	1.4619
0.9920	1.3971	2.8414	0.9830	1.3844	1.7631
QSTD	m=	2.03936	QA	m=	1.27701
	b=	-0.01298		b=	-0.00805
	r=	0.99995		r=	0.99995

Calculations	
Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va= $\Delta Vol((Pa-\Delta P)/Pa)$
Qstd= $Vstd/\Delta Time$	Qa= $Va/\Delta Time$
For subsequent flow rate calculations:	
Qstd= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left(\left(\sqrt{\Delta H (Ta/Pa)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



TE-5170 Calibration Worksheet

Site Information

Location: AM3A	Zones 2A at West Site ID: Kowloon Cultural	Date: 1-May-21
Sampler: TE-5170	Serial No: 4340	Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89	Corrected Pressure (mm Hg): 759
Temperature (deg F): 79	Temperature (deg K): 299
Average Press. (in Hg): 29.89	Corrected Average (mm Hg): 759
Average Temp. (deg F): 79	Average Temp. (deg K): 299

Calibration Orifice

Make: Tisch	Qstd Slope: 2.03936
Model: TE-5025A	Qstd Intercept: -0.01298
Serial#: 3543	Date Certified: 2-Nov-20

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.50	1.735	53.0	52.86	Slope: 30.2026
2	10.80	1.613	48.0	47.87	Intercept: 0.2719
3	7.10	1.309	41.0	40.89	Corr. Coeff: 0.9966
4	4.60	1.055	33.0	32.91	
5	2.50	0.780	23.0	22.94	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure

Average I (chart): 40
Average Flow Calculation m3/min 1.298607231
Average Flow Calculation in CFM 45.85382131
Sample Time (Hrs): 1.0
Total Flow in m3/min 77.91643384
Total Flow in CFM 2751.229279

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM4A	Zones 2A at West Site ID: Kowloon Cultural	Date: 1-May-21
Sampler: TE-5170	Serial No: 3998	Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89	Corrected Pressure (mm Hg): 759
Temperature (deg F): 79	Temperature (deg K): 299
Average Press. (in Hg): 29.89	Corrected Average (mm Hg): 759
Average Temp. (deg F): 79	Average Temp. (deg K): 299

Calibration Orifice

Make: Tisch	Qstd Slope: 2.03936
Model: TE-5025A	Qstd Intercept: -0.01298
Serial#: 3543	Date Certified: 2-Nov-20

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.60	1.742	53.0	52.86	Slope: 29.2120
2	10.30	1.576	48.0	47.87	Intercept: 1.9833
3	7.50	1.346	41.0	40.89	Corr. Coeff: 0.9972
4	4.20	1.009	33.0	32.91	
5	2.30	0.748	23.0	22.94	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure

Average I (chart): 40
Average Flow Calculation m3/min 1.284057228
Average Flow Calculation in CFM 45.34006074
Sample Time (Hrs): 1.0
Total Flow in m3/min 77.04343371
Total Flow in CFM 2720.403644

NOTE: Ensure calibration orifice has been certified within 12 months of use



TE-5170 Calibration Worksheet

Site Information

Location: AM5A	Zones 2A at West Site ID: Kowloon Cultural	Date: 1-May-21
Sampler: TE-5170	Serial No: 4344	Tech: CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.89	Corrected Pressure (mm Hg): 759
Temperature (deg F): 79	Temperature (deg K): 299
Average Press. (in Hg): 29.89	Corrected Average (mm Hg): 759
Average Temp. (deg F): 79	Average Temp. (deg K): 299

Calibration Orifice

Make: Tisch	Qstd Slope: 2.03936
Model: TE-5025A	Qstd Intercept: -0.01298
Serial#: 3543	Date Certified: 2-11-2020

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	12.40	1.728	53.0	52.86	Slope: 29.7007
2	10.60	1.599	48.0	47.87	Intercept: 1.1380
3	7.50	1.346	41.0	40.89	Corr. Coeff: 0.9967
4	4.30	1.020	33.0	32.91	
5	2.40	0.764	23.0	22.94	# of Observations: 5

Calculations

$$Qstd = 1/m[\text{sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure

Average I (chart): 40
Average Flow Calculation m3/min 1.291391727
Average Flow Calculation in CFM 45.59904187
Sample Time (Hrs): 1.0
Total Flow in m3/min 77.4835036
Total Flow in CFM 2735.942512

NOTE: Ensure calibration orifice has been certified within 12 months of use



CERTIFICATE OF ACCREDITATION

This is to attest that

AQUALITY TESTCONSULT LIMITED

11A&B, KAI FONG GARDEN, PING CHE ROAD
FANLING, HONG KONG

Calibration Laboratory CL-207

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date October 19, 2020

Expiration Date December 1, 2021



A handwritten signature in black ink, reading 'Raj Nathan'.

President

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

AQUALITY TESTCONSULT LIMITED

www.aqtlgroup.com

Contact Name Lee Mei Yee Julia

Contact Phone + 852-6309-2280

Accredited to ISO/IEC 17025:2017

Effective Date October 19, 2020

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY ^{1,2} (±)	CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED
<i>Dimensional</i>			
Caliper -Vernier, Dial & Electronic ³	0 mm to 300 mm	30 µm	Checker by comparison method (BS 887:1982)
Steel Ruler ³	1 mm to 1000 mm	280 µm	Reference Steel Rule by comparison method (BS 4372:1968)
Dial Indicator / Gauge (Plunger) ³	0 mm to 50 mm	8 µm	Reference micrometer head by comparison method (BS 907:2008)
Feeler Gauge ³	0.01 mm to 1 mm	8 µm	Reference Dial Gauge by comparison method (BS BS957-2008)
Measuring tape ³	0 m to 1.5 m	1200 µm	Reference steel ruler by comparison method (BS 4035:1966)
Engineering Square ³	Length 0 mm to 160 mm	20 µm	Reference engineering square and Feeler Gauge (BS 939:2007)
Slump cone ³	Diameter = 0 mm to 200 mm Thickness = 1.5 mm Height = 0 mm to 300 mm	560 µm 100 µm 560 µm	Reference Caliper & Reference Steel ruler by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified CS1:1990 Vol.1 A4; CS1: 2010 Vol. 1, A5)
Tamping rod ³	Diameter = 0 mm to 16 mm Length = 600 mm	600 µm 950 µm	Reference steel ruler & Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional

* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

SCOPE OF ACCREDITATION

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MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY ^{1,2} (\pm)	CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED
			requirements as specified CS1:1990 Vol.1 A5;CS1: 2010 Vol. 1, A6)
Cube mould ³	(Max dimensions 150 mm per side) Dimension Flatness Perpendicularity Parallelism	50 μ m 10 μ m 10 μ m 50 μ m	Reference Caliper, straight edge & feeler gauge by direct measurement. (Verification in accordance with in-house method for the dimensional requirements as specified in BS1881: Part 108:1983; CS1:1990 Vol1, A21; CS1:2010 Vol 1, A25; BS EN 12390-2:2000)
Compacting Bar ³	Ramming Face = 25 mm Length = 380 mm Weight = 1.8 kg	100 μ m 560 μ m 1 g	Reference Caliper & Steel ruler by direct measurement. (Verification in accordance with in-house method for the dimensional & mass requirements as specified in BS1881: Part 105:1984 Cl 3.3; CS1:1990 Vol 2, E3 CS1:2010 Vol 1, A15.3; BS EN 12350 -5:2000 Cl 4.3.)
Covermeter	20 mm to 103 mm	2.9 mm	Reference concrete block (Verification in accordance with in-house method for the dimensional requirements as specified in BS 1881:Part 204:1988 Cl.6.4- Method C)
Flow table ³	15 kg to 17 kg 1 mm to 71 mm	12 g 600 μ m	Weighing Balance, Reference caliper & Reference steel ruler by direct measurement
Test Sieve ³	4 mm to 50 mm	50 μ m	Reference Caliper by direct measurement
Mechanical			
Force Measuring Machine ³ (Compression Mode)	1 kN to 3000 kN	0.4 %	Ref. Load cell by direct measurement BS 1610: Part 1:1985; BS 1610: Part 1:1992; BS EN ISO 12390-4:2000 Annex B; BS EN ISO 7500-1:2004
Laser Dust Meter ³	Dust particles 0.001 mg/m ³ to 10.00 mg/m ³	0.9 mg/m ³	By comparison method by using reference laser dust meter

SCOPE OF ACCREDITATION

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MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY ^{1,2} (\pm)	CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED
Rebound Hammer ³	80 unit (hardness)	1.6 rebound count	Reference Rebound count by comparison method. BS1881: Part 202:1986; BS EN 12504-2:2001; BS EN 12504-2:2012
Mass (F2 class and coarser)	1 g to 200 g 200 g to 5 kg 5 kg to 10 kg 10 kg to 50 kg	1.3 mg 0.5 g 1 g 7 g	Standard Weight E2/ F1 Class & Weighing Balances by comparison method (OIMLR111)
Weighing Scale & Balance ³	1 g to 200 g 200 g to 5 kg 5 kg to 50 kg	1 mg 1 g 15 g	Standard weight of E2/F1 Grade by direct measurement
Volumetric Glassware	1 mL to 100 mL 100 mL to 1000 mL	0.004 mL 0.09 mL	Standard weight E2 Class, Weighing Balances & Distilled water by gravimetric method
Thermal			
Digital/Liquid in Glass Thermometers & RTD/ Thermocouples with or without Indicators	15 °C to 55°C 55°C to 95°C	0.4 °C 0.9 °C	Water Baths, Reference Sensor and Indicator by Comparison Method (OIML R133)
Curing Tank ³	(Calibration at 20 °C & 27 °C @ 30 min) 20 °C Temperature distribution 27 °C Temperature distribution Efficiency of circulation	0.4 °C 0.8 °C 5 s	Reference Temperature datalogger by Mapping Method & Reference Stop Watch (Verification in accordance with in-house method for the Temp & Time requirements as specified in BS1881-111:1983 CS1:1990 Vol 1 App A24 CS1:2010 Vol 1 App A28 BE EN 12390-2:2000
Oven ³	40.0 °C to 180.0 °C	1.5 °C	Reference Temperature datalogger by Mapping Method (AS 2853:1986)
Furnace ³	200 °C to 1300 °C	6 °C	Reference Thermocouple with Indicator By single point Calibration (AS 2853:1986)
Water bath ³	15 °C to 95 °C	0.2 °C	Reference Temperature datalogger by Mapping Method (AS 2853:1986)
Time and Frequency			
Stop Watch/ Timer ³	10 s to 3600 s	0.2 s	Reference stop watch

SCOPE OF ACCREDITATION

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MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY ^{1,2} (\pm)	CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED
Grout Flow Cone ³	7 s to 9 s	0.2 s	Reference stop watch by direct method (ASTM C939-10 Cl.9)

¹The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

²When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

³Also available as site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.

FAQ / Information

Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

Mutual Recognition Arrangement (MRA) Partners for HOKLAS ^

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and the [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» [Mutual Recognition Arrangement \(MRA\) Partners for HOKLAS](#)

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

Multilateral Recognition Arrangements (MLA) for HKCAS ^

HKAS has been a signatory of [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for Quality Management System (QMS), Environmental Management System (EMS), Food Safety Management System (FSMS), Energy Management System (EnMS), Occupational Health and Safety Management System (OHSMS) certifications, product certifications, and Greenhouse Gas (GHG) validation and verification.

HKAS has also been a signatory of the [International Accreditation Forum Multilateral Recognition Arrangement \(IAF MLA\)](#) for Quality Management System (QMS), Environmental Management System (EMS), Food Safety Management System (FSMS), Energy Management System (EnMS), Occupational Health and Safety Management System (OHSMS) certifications, product certifications, and Greenhouse Gas (GHG) validation and verification.

Click [here](#) to view the up-to-date signatories of IAF and [here](#) to access the up-to-date signatories of APAC.

» [Mutual / Multilateral Recognition Arrangements \(MRA / MLA\) Partners for HKCAS](#)

Mutual Recognition Arrangement (MRA) Partners for HKIAS ^





HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for inspection. Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

HKAS MRA partners will recognise HKIAS endorsed inspection reports or certificates having the same technical validity as reports or certificates endorsed by their respective schemes.

» [Mutual Recognition Arrangement \(MRA\) Partners for HKIAS](#)

 back

Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

Economy	Logo	Name of Partner	URL	Test Area
United Kingdom of Great Britain and Northern Ireland		United Kingdom Accreditation Service (UKAS)	http://www.ukas.com	Calibration, Medical Testing, Proficiency Testing Provider, Reference Material Producer, Non-medical Testing
United States of America		AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC)	http://www.aihaaccreditedlabs.org/	Non-medical Testing
United States of America		American Association for Laboratory Accreditation (A2LA)	http://www.a2la.org/	Calibration, Medical Testing, Proficiency Testing Provider, Reference Material Producer, Non-medical Testing
United States of America		ANSI-ASQ National Accreditation Board (ANAB)	https://www.ansi.org/accreditation/Default	Calibration, Medical Testing, Proficiency Testing Provider, Reference Material Producer, Non-medical Testing
United States of America		International Accreditation Service Inc. (IAS)	http://www.iasonline.org/	Calibration, Non-medical Testing
United States of America		National Voluntary Laboratory Accreditation Program (NVLAP)	http://www.nist.gov/nvlap	Calibration, Non-medical Testing



CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-126F
 Date of Report : 12-Nov-20
 Page Number : 1 of 2
 Customer * : Apex Testing & Certification Ltd.
 Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
 Customers Ref. * : A005

Item Under Calibration (IUC)*

Equipment No. : N/A
 Manufacturer : Sibata Scientific Technology Ltd
 Model No. : LD-3B
 Serial No. : 235811
 Scale Division : 0.001 mg/m³
 Range : 0.001 to 1 mg/m³
 Condition of Item : Normal

Date Item Received : 8-Nov-20
 Date Calibrated : 8-Nov-20
 Calibration Location : AQuality Calibration Lab.
 Date of Next Calibration : 7-Nov-21
 Calibrated By : Jessica Liu

Test Environment

Ambient Temperature : 27.5 °C to 23.9 °C
 Relative Humidity : 51 % to 83 %

Calibration Results

Reference True Reading (mg/m ³)	Average IUC Reading (mg/m ³)	Correction (mg/m ³)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m ³)	Coverage Factor K
0.158	0.167	-0.008	5.1%	0.020	2.0
5.164	5.647	-0.484	8.5%	0.463	2.0
10.100	11.141	-1.041	9.3%	0.904	2.0

Remarks

1. * Denotes information supplied by customer.
 2. The results relate only to the items calibrated.
 3. The results apply to the items as received.
 4. Correction = Average of (Ref reading - IUC reading)
 5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____

LEE Mei Yee, Julia
 Managing Director



CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-126F
Date of Report : 12-Nov-20
Page Number : 2 of 2
Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

Details of Calibration

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

<u>Equipment Number</u>	<u>Certificate Number</u>	<u>Description</u>
CH-LDM-1	HBW202001563	粉尘测试仪

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	201108MCA-126F
	Date of Issue	12-Nov-20
	Date of Testing	8-Nov-20
	Page	1 of 1

Item for Calibration

Description	: Laser Dust Monitor
Manufacturer	: Sibata Scientific Technology Ltd
Model No.	: LD-3B
Serial No.	: 235811

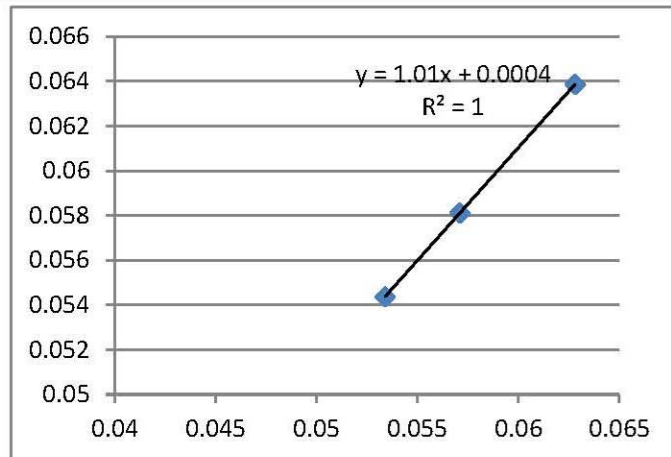
Standard Equipment

Description	: High Volume Sampler / Calibration Orifice
Manufacturer	: Tisch Environmental, Inc.
Model No.	: TE-5170 / TE-5025A
Serial No.	: 4344 / 3543
Last Calibration	: 8-Nov-20 / 2-Nov-20

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
8-Nov-20	20:15	25.7	1017.2	0.0628	0.0639
8-Nov-20	21:20	25.7	1017.2	0.0534	0.0544
8-Nov-20	22:25	25.7	1017.2	0.0571	0.0581

By Linear Regression of Y or X

Slope (K-factor)	: 1.0100
Correlation Coefficient	: 1.0000
Validity of Calibration	: 7-Nov-21



Recorded by : Jessica Liu Signature: Jessica Liu Date: 8-Nov-20

Checked by : S Tang Signature: S Tang Date: 8-Nov-20



香港新界粉嶺坪輦路啟芳園11A&11B號

No. 11A&B, KAI FONG GARDEN, PING CHE ROAD, FANLING, NEW TERRITORIES, HONG KONG

TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-123F
Date of Report : 12-Nov-20
Page Number : 1 of 2
Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*

Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338
Scale Division : 0.001 mg/m³
Range : 0.001 to 1 mg/m³
Condition of Item : Normal

Date Item Received : 8-Nov-20
Date Calibrated : 8-Nov-20
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 7-Nov-21
Calibrated By : Jessica Liu

Test Environment

Ambient Temperature : 27.5 °C to 23.9 °C
Relative Humidity : 51 % to 83 %

Calibration Results

Reference True Reading (mg/m ³)	Average IUC Reading (mg/m ³)	Correction (mg/m ³)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m ³)	Coverage Factor K
0.158	0.168	-0.010	5.7%	0.026	2.0
5.164	5.562	-0.398	7.1%	0.462	2.0
10.100	10.936	-0.837	7.6%	0.905	2.0

Remarks

1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____

LEE Mei Yee, Julia
Managing Director



CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-123F
Date of Report : 12-Nov-20
Page Number : 2 of 2
Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

Details of Calibration

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

<u>Equipment Number</u>	<u>Certificate Number</u>	<u>Description</u>
CH-LDM-1	HBW202001563	粉尘测试仪

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	201108MCA-123F
	Date of Issue	12-Nov-20
	Date of Testing	8-Nov-20
	Page	1 of 1

Item for Calibration

Description	: Laser Dust Monitor
Manufacturer	: Sibata Scientific Technology Ltd
Model No.	: LD-3B
Serial No.	: 336338

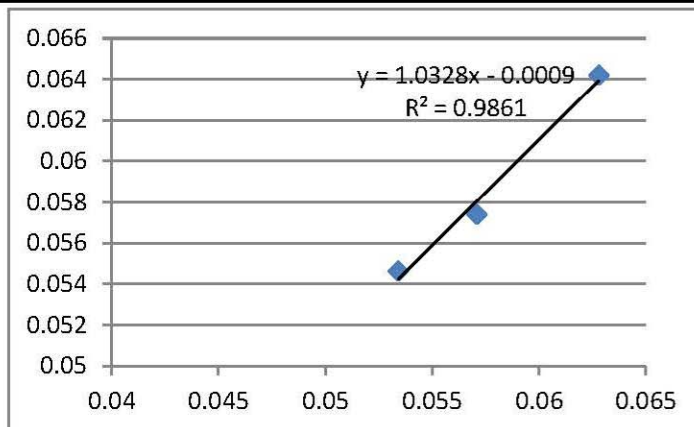
Standard Equipment

Description	: High Volume Sampler / Calibration Orifice
Manufacturer	: Tisch Environmental, Inc.
Model No.	: TE-5170 / TE-5025A
Serial No.	: 4344 / 3543
Last Calibration	: 8-Nov-20 / 2-Nov-20

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
8-Nov-20	20:15	25.7	1017.2	0.0628	0.0642
8-Nov-20	21:20	25.7	1017.2	0.0534	0.0546
8-Nov-20	22:25	25.7	1017.2	0.0571	0.0574

By Linear Regression of Y or X

Slope (K-factor)	: 1.0328
Correlation Coefficient	: 0.9861
Validity of Calibration	: 7-Nov-21



Recorded by : Jessica Liu Signature: Jessica Liu Date: 8-Nov-20

Checked by : S Tang Signature: S Tang Date: 8-Nov-20



CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-125F
Date of Report : 12-Nov-20
Page Number : 1 of 2
Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*

Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 567188
Scale Division : 0.001 mg/m³
Range : 0.001 to 1 mg/m³
Condition of Item : Normal

Date Item Received : 8-Nov-20
Date Calibrated : 8-Nov-20
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 7-Nov-21
Calibrated By : Jessica Liu

Test Environment

Ambient Temperature : 27.5 °C to 23.9 °C
Relative Humidity : 51 % to 83 %

Calibration Results

Reference True Reading (mg/m ³)	Average IUC Reading (mg/m ³)	Correction (mg/m ³)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m ³)	Coverage Factor K
0.158	0.167	-0.008	4.9%	0.023	2.0
5.164	5.693	-0.530	9.3%	0.463	2.0
10.100	11.045	-0.945	8.6%	0.905	2.0

Remarks

1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____

LEE Mei Yee, Julia
Managing Director



CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-125F
Date of Report : 12-Nov-20
Page Number : 2 of 2
Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

Details of Calibration

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

<u>Equipment Number</u>	<u>Certificate Number</u>	<u>Description</u>
CH-LDM-1	HBW202001563	粉尘测试仪

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	201108MCA-125F
	Date of Issue	12-Nov-20
	Date of Testing	8-Nov-20
	Page	1 of 1

Item for Calibration

Description : Laser Dust Monitor
 Manufacturer : Sibata Scientific Technology Ltd
 Model No. : LD-3B
 Serial No. : 567188

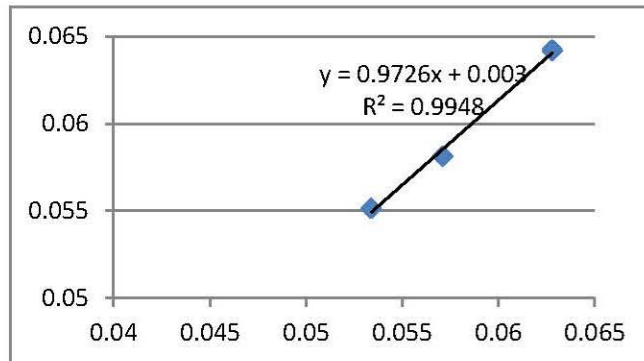
Standard Equipment

Description : High Volume Sampler / Calibration Orifice
 Manufacturer : Tisch Environmental, Inc.
 Model No. : TE-5170 / TE-5025A
 Serial No. : 4344 / 3543
 Last Calibration : 8-Nov-20 / 2-Nov-20

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
8-Nov-20	20:15	25.7	1017.2	0.0628	0.0642
8-Nov-20	21:20	25.7	1017.2	0.0534	0.0552
8-Nov-20	22:25	25.7	1017.2	0.0571	0.0581

By Linear Regression of Y or X

Slope (K-factor) : 0.9726
 Correlation Coefficient : 0.9948
 Validity of Calibration : 7-Nov-21



Recorded by : Jessica Liu Signature: Jessica Liu Date: 8-Nov-20

Checked by : S Tang Signature: S Tang Date: 8-Nov-20



CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1005 01-05 Page 1 of 2

Item tested

Description: Sound Level Meter (Class 1) , Microphone
Manufacturer: Hangzhou Aihua Instruments Co., Ltd , -
Type/Model No.: AWA5661 , AWA14425
Serial/Equipment No.: 301135 , 15338
Adaptors used: - , -

Item submitted by

Customer Name: Apex Testing & Certification Ltd.
Address of Customer: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T.
Request No.: -
Date of receipt: 05-Oct-2020

Date of test: 09-Oct-2020

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021	CIGISMEC
Signal generator	DS 360	61227	24-Dec-2020	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:



Feng Junqi

Date: 10-Oct-2020

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA1005 01-05 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL Frequency weightings	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip
09-Oct-2020

Checked by:

Date:

Feng Junqi
10-Oct-2020

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020
 Microphone type: AWA14425 Serial No. 15338

Report: 20CA1005 01-05

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting 12.3 dB
 Noise level in C weighting 13.6 dB
 Noise level in Lin 18.2 dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	98.9	98.9	0.7	-0.1	-0.1
104.0	103.9	103.9	0.7	-0.1	-0.1
109.0	108.9	108.9	0.7	-0.1	-0.1
114.0	113.9	113.9	0.7	-0.1	-0.1
115.0	114.9	114.9	0.7	-0.1	-0.1
116.0	115.9	115.9	0.7	-0.1	-0.1
117.0	116.9	116.9	0.7	-0.1	-0.1
118.0	117.9	117.9	0.7	-0.1	-0.1
119.0	118.9	118.9	0.7	-0.1	-0.1
120.0	119.9	119.9	0.7	-0.1	-0.1
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.1	54.1	0.7	0.1	0.1
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
34.0	34.0	34.0	0.7	0.0	0.0
29.0	29.0	29.0	0.7	0.0	0.0
28.0	28.0	28.0	0.7	0.0	0.0



Test Data for Sound Level Meter

Page 2 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020
Microphone type: AWA14425 Serial No. 15338
Report: 20CA1005 01-05

27.0	27.1	27.1	0.7	0.1	0.1
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Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
27-120	94.0	94.0	0.7	0.0
45-140	94.0	93.9	0.7	-0.1

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
27-120	29.0	29.0	0.7	0.0
	118.0	117.9	0.7	-0.1
45-140	47.0	47.1	0.7	0.1
	138.0	137.8	0.7	-0.2

FREQUENCY WEIGHTING TEST

The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
				+	-	
Hz	dB	dB	dB			dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.4	1.5	1.5	-0.2
63.1	94.0	67.8	67.7	1.5	1.5	-0.1
125.9	94.0	77.9	77.8	1.0	1.0	-0.1
251.2	94.0	85.4	85.3	1.0	1.0	-0.1
501.2	94.0	90.8	90.7	1.0	1.0	-0.1
1995.0	94.0	95.2	95.3	1.0	1.0	0.1
3981.0	94.0	95.0	95.3	1.0	1.0	0.3
7943.0	94.0	92.9	93.6	1.5	3.0	0.7
12590.0	94.0	89.7	89.4	3.0	6.0	-0.3

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
				+	-	
Hz	dB	dB	dB			dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	90.9	1.5	1.5	-0.1
63.1	94.0	93.2	93.1	1.5	1.5	-0.1
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0



Test Data for Sound Level Meter

Page 3 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020
 Microphone type: AWA14425 Serial No. 15338

Report: 20CA1005 01-05

1995.0	94.0	93.8	93.9	1.0	1.0	0.1
3981.0	94.0	93.2	93.5	1.0	1.0	0.3
7943.0	94.0	91.0	91.7	1.5	3.0	0.7
12590.0	94.0	87.8	87.5	3.0	6.0	-0.3

Frequency weighting Lin:

Frequency Hz	Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
				+	-	
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	93.9	1.5	1.5	-0.1
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	93.9	3.0	6.0	-0.1

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
			+	-	
116.0	115.0	114.9	1.0	1.0	-0.1

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
			+	-	
116.0	111.9	111.9	1.0	1.0	0.0

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Positive polarities: (Weighting Z, set the generator signal to single, Lzpeak)

Ref. level dB	Response to 10 ms dB	Response to 100 us dB	Tolerance +/- dB	Deviation dB
119.0	119.0	119.5	2.0	0.5



Test Data for Sound Level Meter

Page 4 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020
Microphone type: AWA14425 Serial No. 15338
Report: 20CA1005 01-05

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	119.5	2.0	0.5

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
Time weighting	dB	dB	indication(dB)	+/- dB	dB
Slow	117.0+6.6	117.0	116.6	0.5	-0.4

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
dB	Expected (dB)	Actual (dB)	+/- dB	dB
120.0	117.3	117.1	1.0	-0.2

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks
msec	dB	dB	dB	+/- dB	dB	
1000	90.0	90.0	89.9	1.0	-0.1	60s integ.
10000	80.0	80.0	79.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz

Integration time: 10 sec



Test Data for Sound Level Meter

Page 5 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020
Microphone type: AWA14425 Serial No. 15338
Report: 20CA1005 01-05

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	90.0	60.0	60.0	1.7	0.0

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	90.0	70.0	70.0	1.7	0.0

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
Amplitude: 2 dB below the upper limit of the primary indicator range.
Burst repetition frequency: 40 Hz
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
115.7	114.7	111.7	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following:
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz
Integration time: 10 sec
Single burst duration: 1 msec

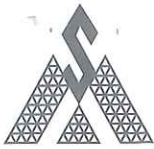
Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
122.0	121.0	81.0	81.0	2.2	0.0

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
			+	-	
Hz	dB	Measured (dB)			dB
1000	94.0	94.0	0.0	0.0	0.0
125	77.9	78.2	1.0	1.0	0.3
8000	92.9	93.6	1.5	3.0	0.7

-----END-----



CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0616 03-02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Pulsar
Type/Model No.: 100B
Serial/Equipment No.: 039507
Adaptors used: Yes

Item submitted by

Customer: Apex Testing & Certification Ltd.
Address of Customer: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T.
Request No.: -
Date of receipt: 16-Jun-2020

Date of test: 20-Jun-2020

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	SCL
Preamplifier	B&K 2673	2743150	03-Jun-2021	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CEPREI
Signal generator	DS 360	33873	19-May-2021	CEPREI
Digital multi-meter	34401A	US36087050	19-May-2021	CEPREI
Audio analyzer	8903B	GB41300350	18-May-2021	CEPREI
Universal counter	53132A	MY40003662	18-May-2021	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Feng Junqi

Date: 22-Jun-2020

Company Chop:



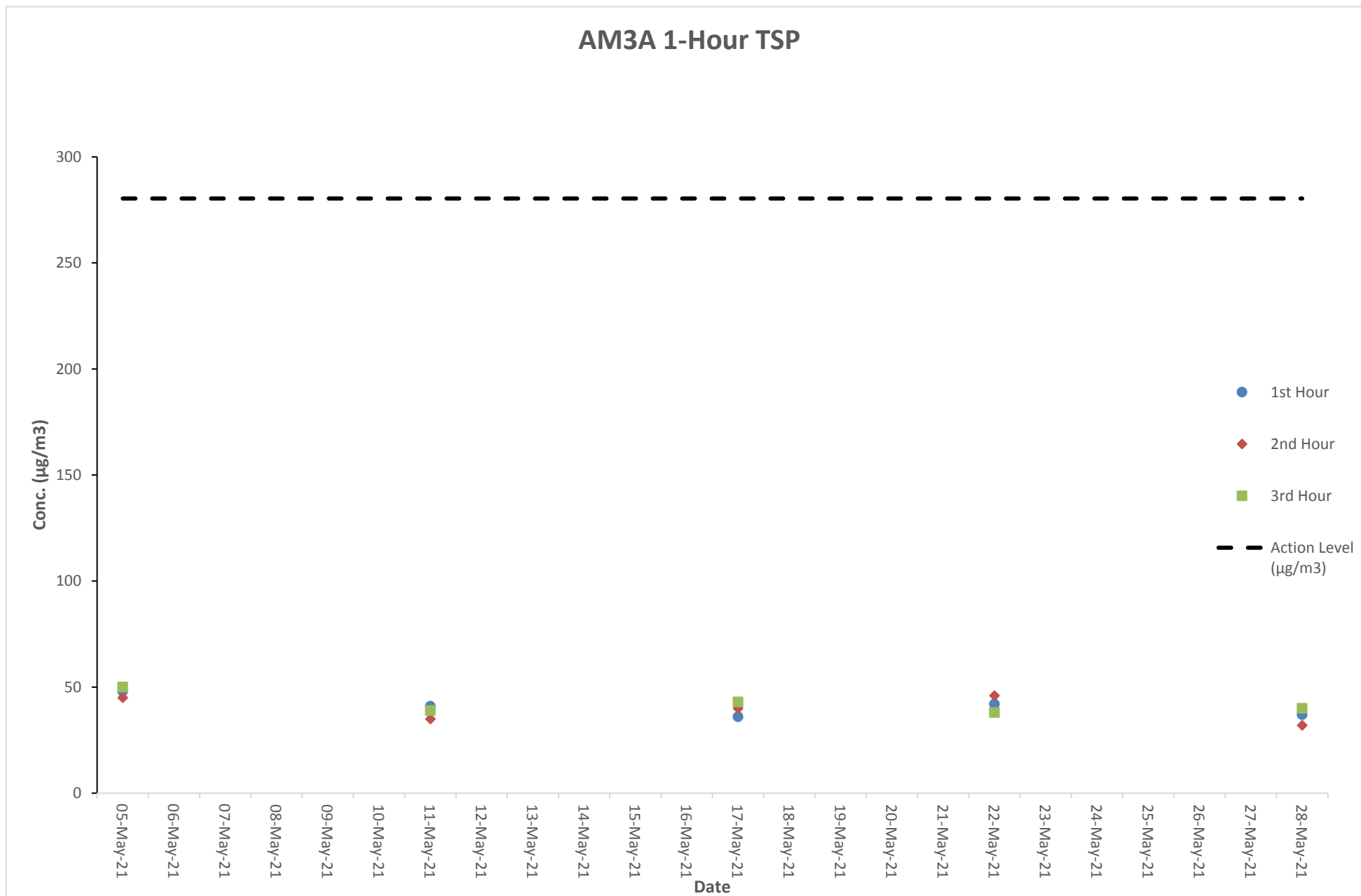
Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

G. Graphical Plots of the Monitoring Results

Air Quality Monitoring Result at Station AM3A (1-hour TSP)

Date	Weather Condition	Time		Conc. ($\mu\text{g}/\text{m}^3$)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
05-May-21	Cloudy	8:01	11:01	48	45	50	280.4	500
11-May-21	Cloudy	14:03	17:03	41	35	39	280.4	500
17-May-21	Fine	8:02	11:02	36	40	43	280.4	500
22-May-21	Cloudy	14:05	17:05	42	46	38	280.4	500
28-May-21	Fine	8:10	11:10	37	32	40	280.4	500

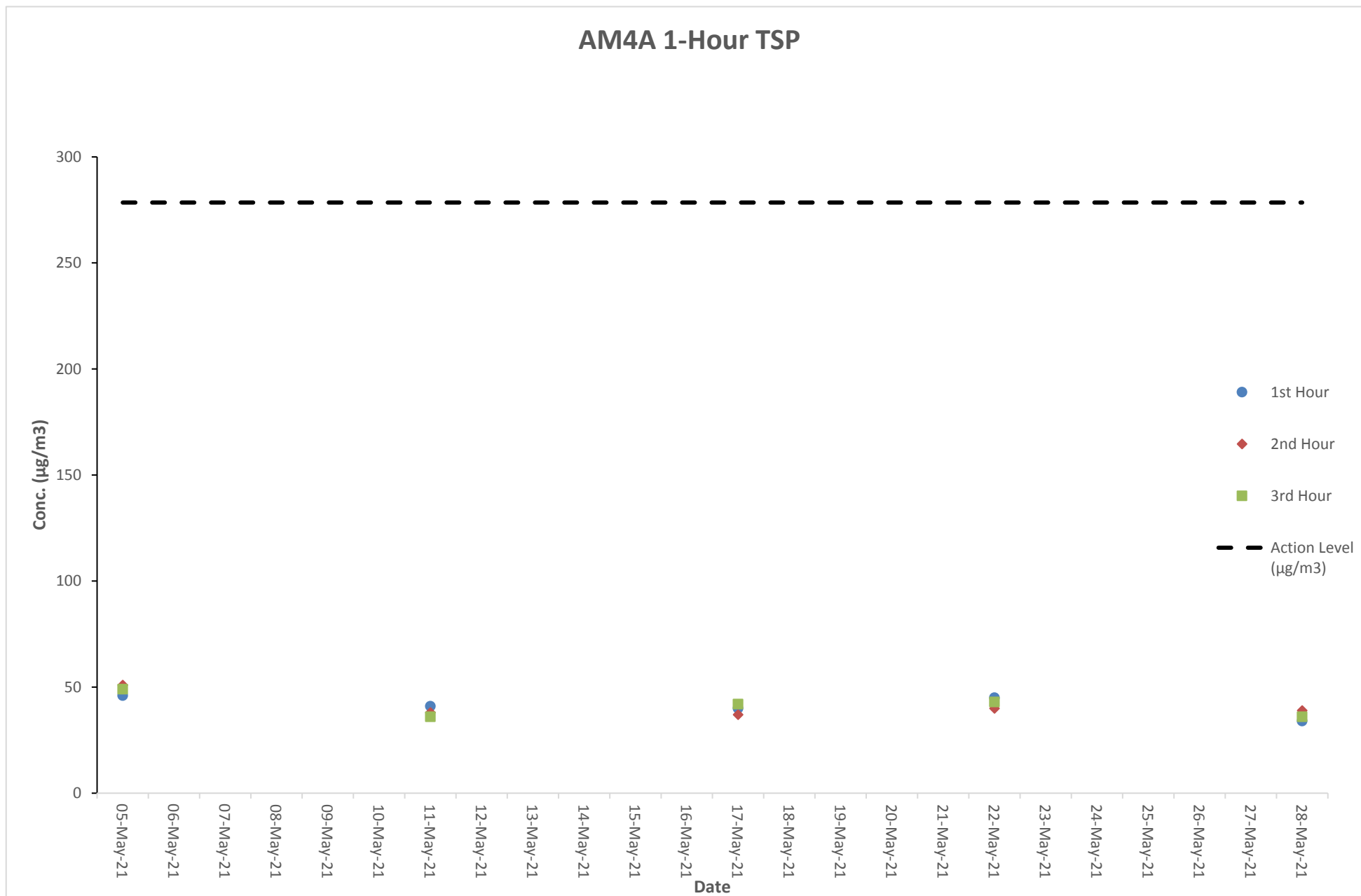
Graphical Presentation of Air Quality Monitoring Result at Station AM3A (1-hour TSP)



Air Quality Monitoring Result at Station AM4A (1-hour TSP)

Date	Weather Condition	Time		Conc. ($\mu\text{g}/\text{m}^3$)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
05-May-21	Cloudy	8:09	11:09	46	51	49	278.5	500
11-May-21	Cloudy	14:11	17:11	41	38	36	278.5	500
17-May-21	Fine	8:10	11:10	40	37	42	278.5	500
22-May-21	Cloudy	14:13	17:13	45	40	43	278.5	500
28-May-21	Fine	8:18	11:18	34	39	36	278.5	500

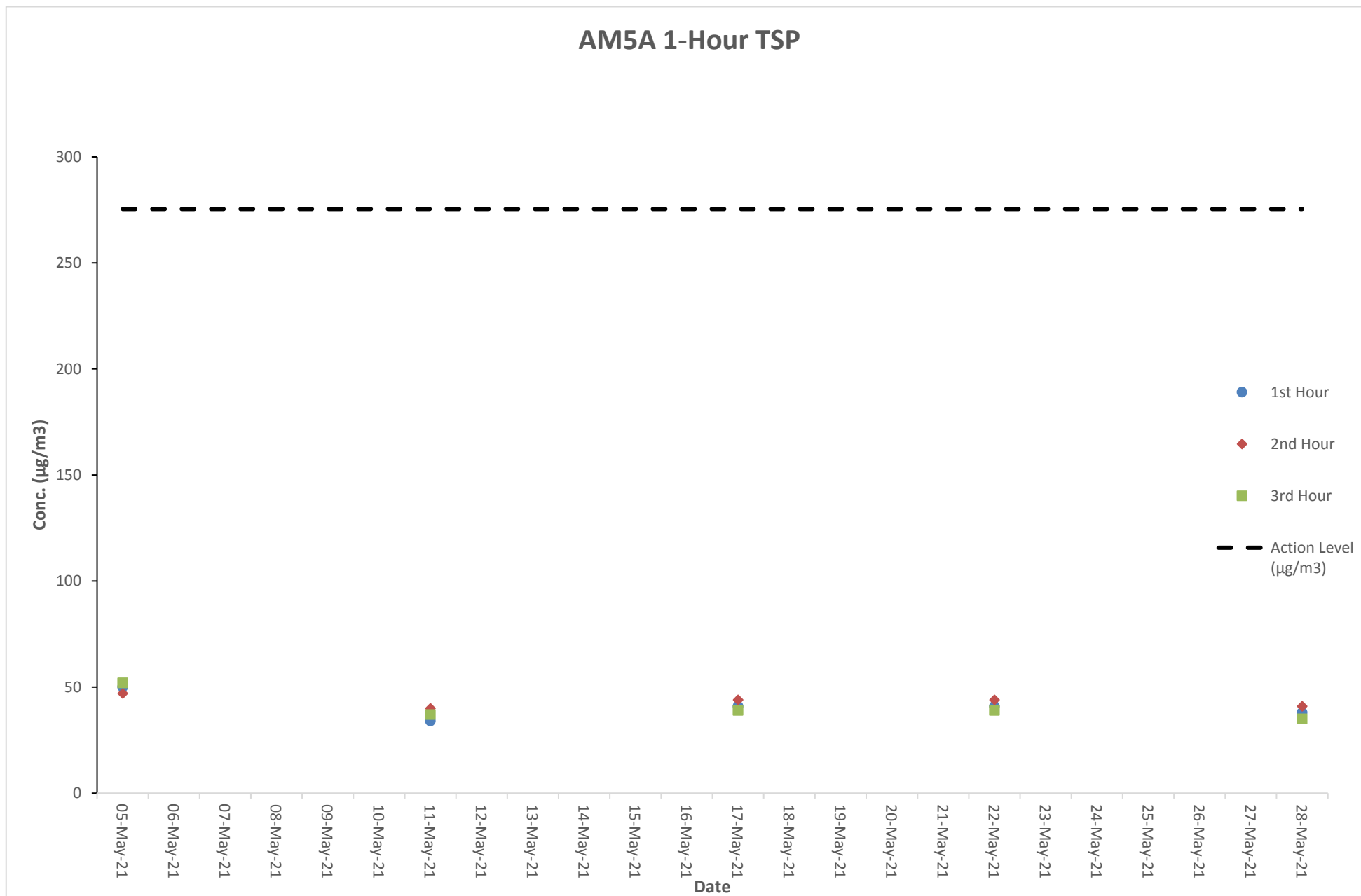
Graphical Presentation of Air Quality Monitoring Result at Station AM4A (1-hour TSP)



Air Quality Monitoring Result at Station AM5A (1-hour TSP)

Date	Weather Condition	Time		Conc. ($\mu\text{g}/\text{m}^3$)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
05-May-21	Cloudy	8:24	11:24	50	47	52	275.4	500
11-May-21	Cloudy	14:28	17:28	34	40	37	275.4	500
17-May-21	Fine	8:25	11:25	41	44	39	275.4	500
22-May-21	Cloudy	14:30	17:30	41	44	39	275.4	500
28-May-21	Fine	8:33	11:33	38	41	35	275.4	500

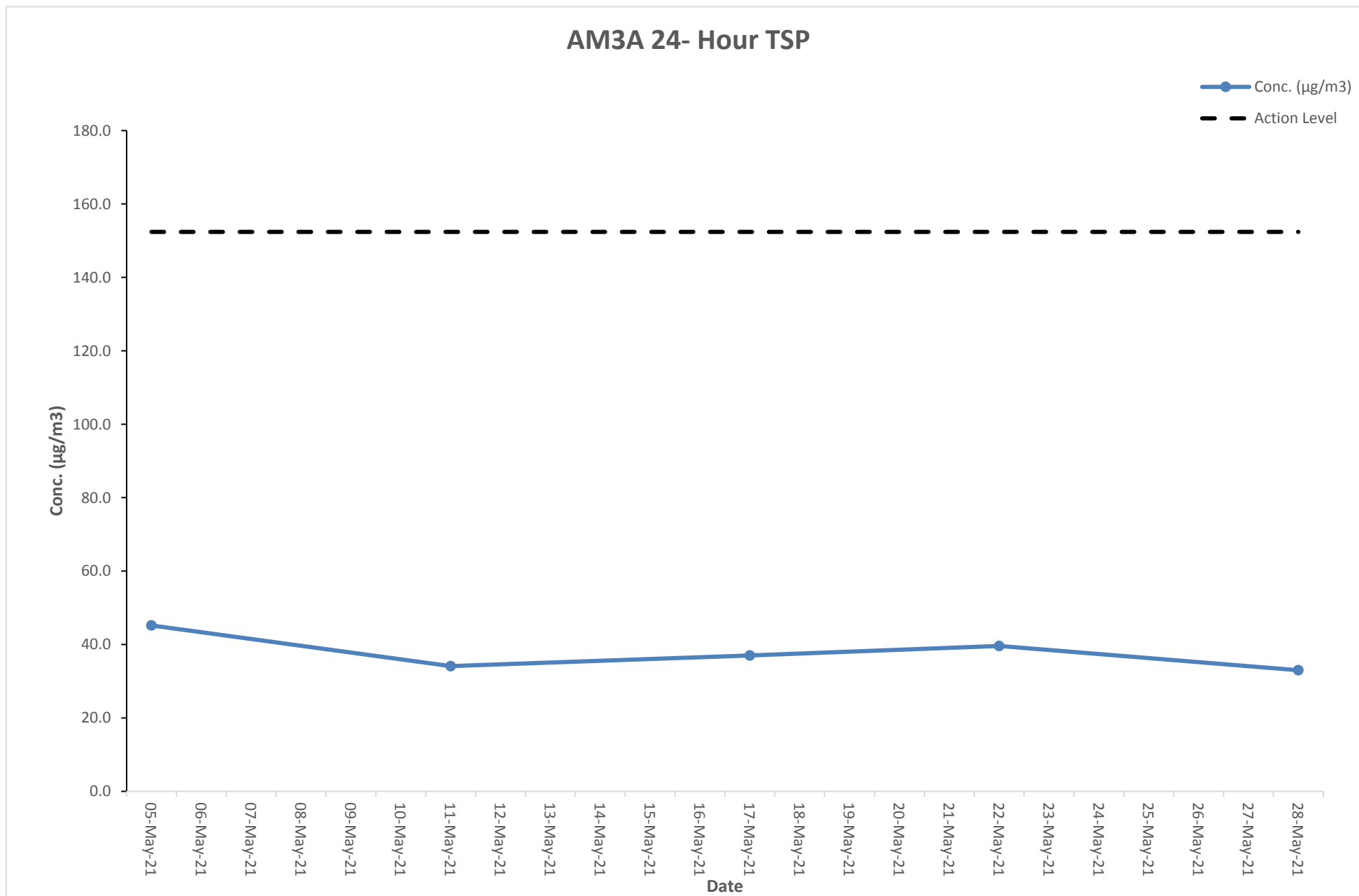
Graphical Presentation of Air Quality Monitoring Result at Station AM5A (1-hour TSP)



Air Quality Monitoring Result at Station AM3A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			Conc. (µg/m ³)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-May-21	10:00AM	06-May-21	10:00AM	2.8061	2.8789	1940.8	1964.8	24	1.12	1.12	1.12	45.2	Cloudy	152.4	260
11-May-21	10:00AM	12-May-21	10:00AM	2.8019	2.8567	1964.8	1988.8	24	1.12	1.12	1.12	34.1	Fine	152.4	260
17-May-21	10:00AM	18-May-21	10:00AM	2.8041	2.8636	1988.8	2012.8	24	1.12	1.12	1.12	37.0	Sunny	152.4	260
22-May-21	10:00AM	23-May-21	10:00AM	2.8029	2.8667	2012.8	2036.8	24	1.12	1.12	1.12	39.6	Cloudy	152.4	260
28-May-21	10:00AM	29-May-21	10:00AM	2.8077	2.8608	2036.8	2060.8	24	1.12	1.12	1.12	33.0	Sunny	152.4	260

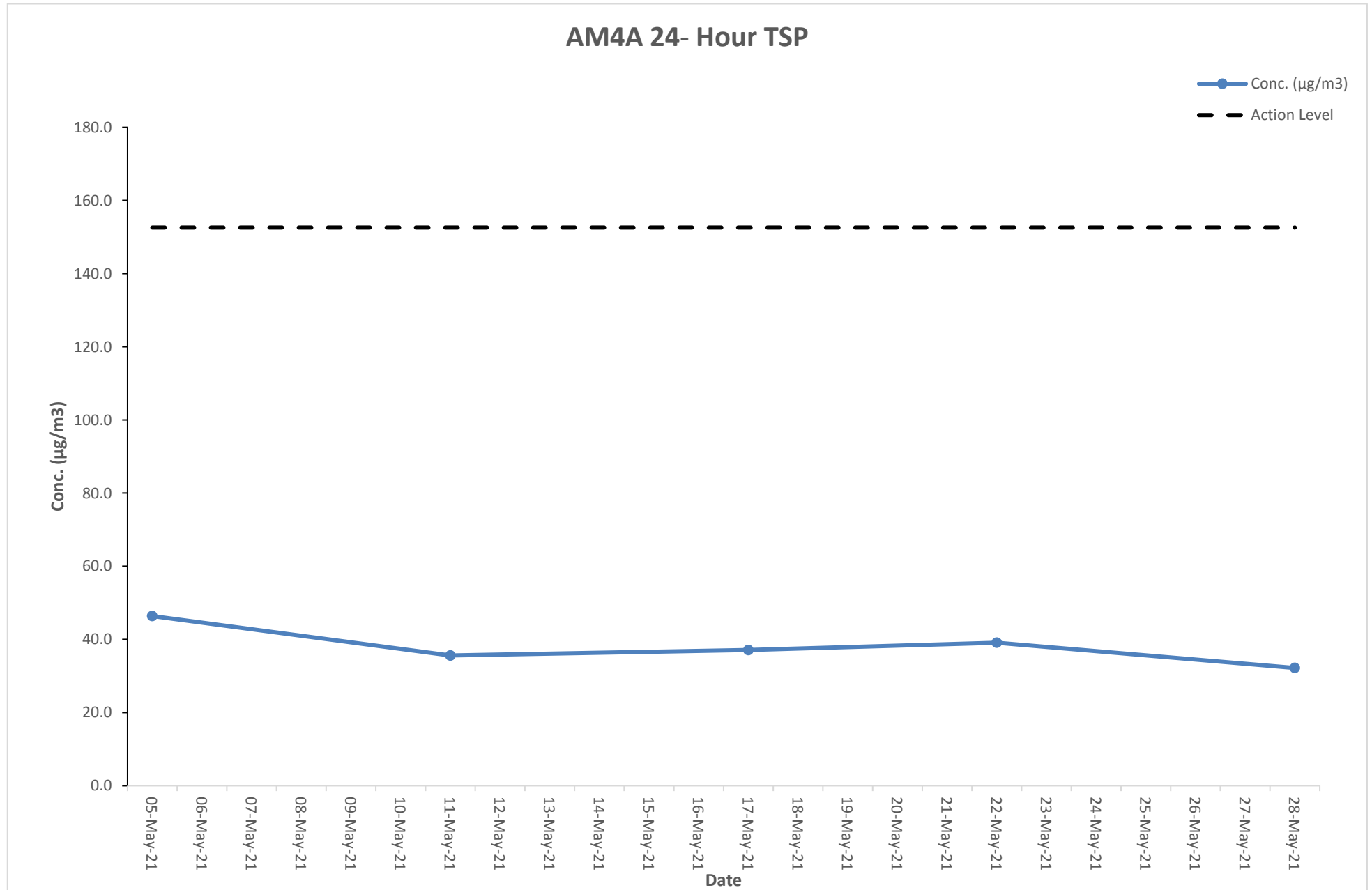
Graphical Presentation of Air Quality Monitoring Result at Station AM3A (24-hour TSP)



Air Quality Monitoring Result at Station AM4A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			Conc. (µg/m ³)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-May-21	10:00AM	06-May-21	10:00AM	2.8065	2.8813	2360.4	2384.4	24	1.12	1.12	1.12	46.4	Cloudy	152.6	260
11-May-21	10:00AM	12-May-21	10:00AM	2.8040	2.8613	2384.4	2408.4	24	1.12	1.12	1.12	35.6	Fine	152.6	260
17-May-21	10:00AM	18-May-21	10:00AM	2.8082	2.8680	2408.4	2432.4	24	1.12	1.12	1.12	37.1	Sunny	152.6	260
22-May-21	10:00AM	23-May-21	10:00AM	2.8038	2.8667	2432.4	2456.4	24	1.12	1.12	1.12	39.1	Cloudy	152.6	260
28-May-21	10:00AM	29-May-21	10:00AM	2.8060	2.8578	2456.4	2480.4	24	1.12	1.12	1.12	32.2	Sunny	152.6	260

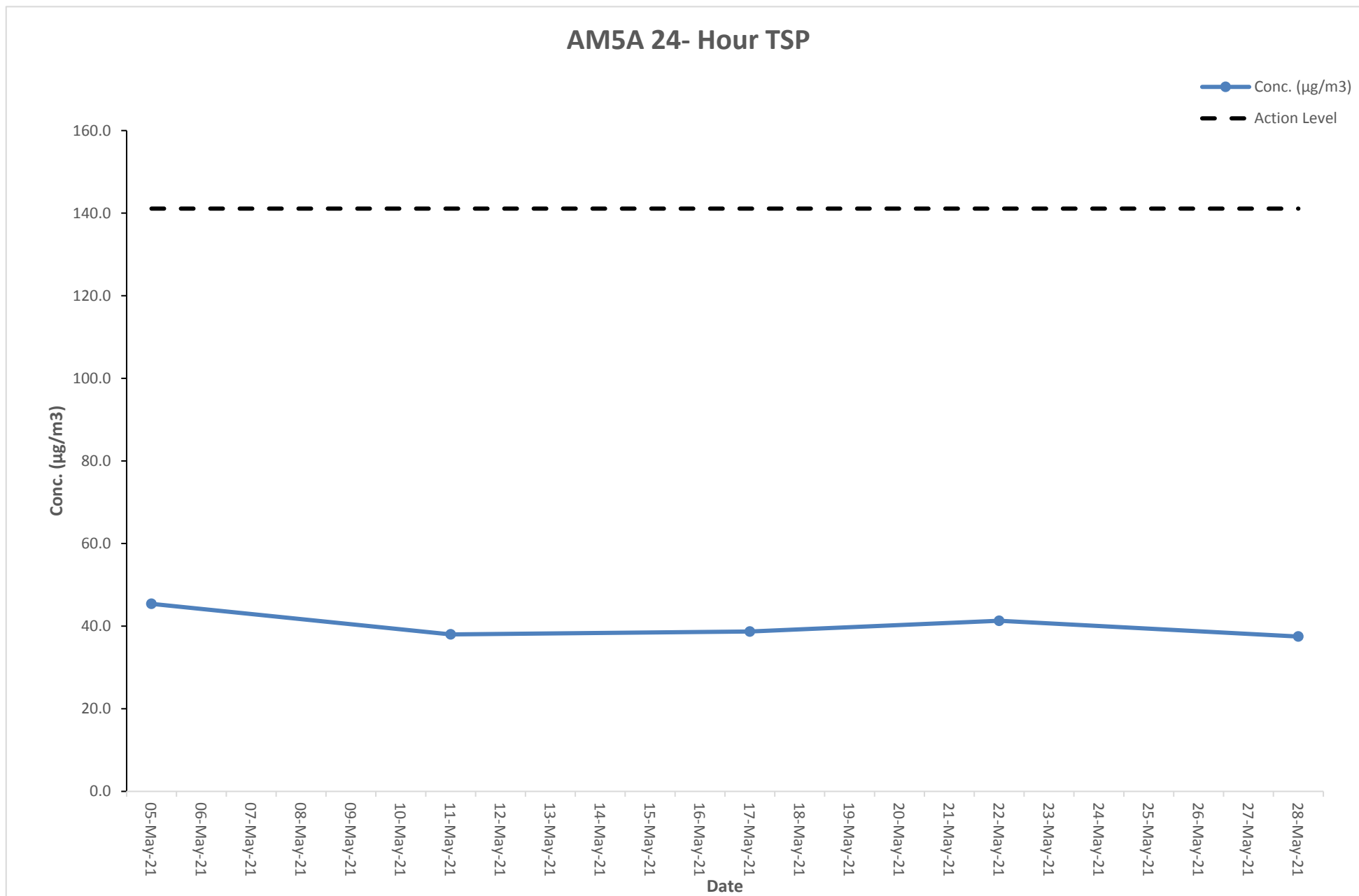
Graphical Presentation of Air Quality Monitoring Result at Station AM4A (24-hour TSP)



Air Quality Monitoring Result at Station AM5A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m ³ /min)			Conc. (µg/m ³)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-May-21	10:00AM	06-May-21	10:00AM	2.8014	2.8745	2500.6	2524.6	24	1.12	1.12	1.12	45.4	Cloudy	141.1	260
11-May-21	10:00AM	12-May-21	10:00AM	2.8071	2.8683	2524.6	2548.6	24	1.12	1.12	1.12	38.0	Fine	141.1	260
17-May-21	10:00AM	18-May-21	10:00AM	2.8031	2.8654	2548.6	2572.6	24	1.12	1.12	1.12	38.7	Sunny	141.1	260
22-May-21	10:00AM	23-May-21	10:00AM	2.8085	2.8749	2572.6	2596.6	24	1.12	1.12	1.12	41.3	Cloudy	141.1	260
28-May-21	10:00AM	29-May-21	10:00AM	2.8031	2.8635	2596.6	2620.6	24	1.12	1.12	1.12	37.5	Sunny	141.1	260

Graphical Presentation of Air Quality Monitoring Result at Station AM5A (24-hour TSP)



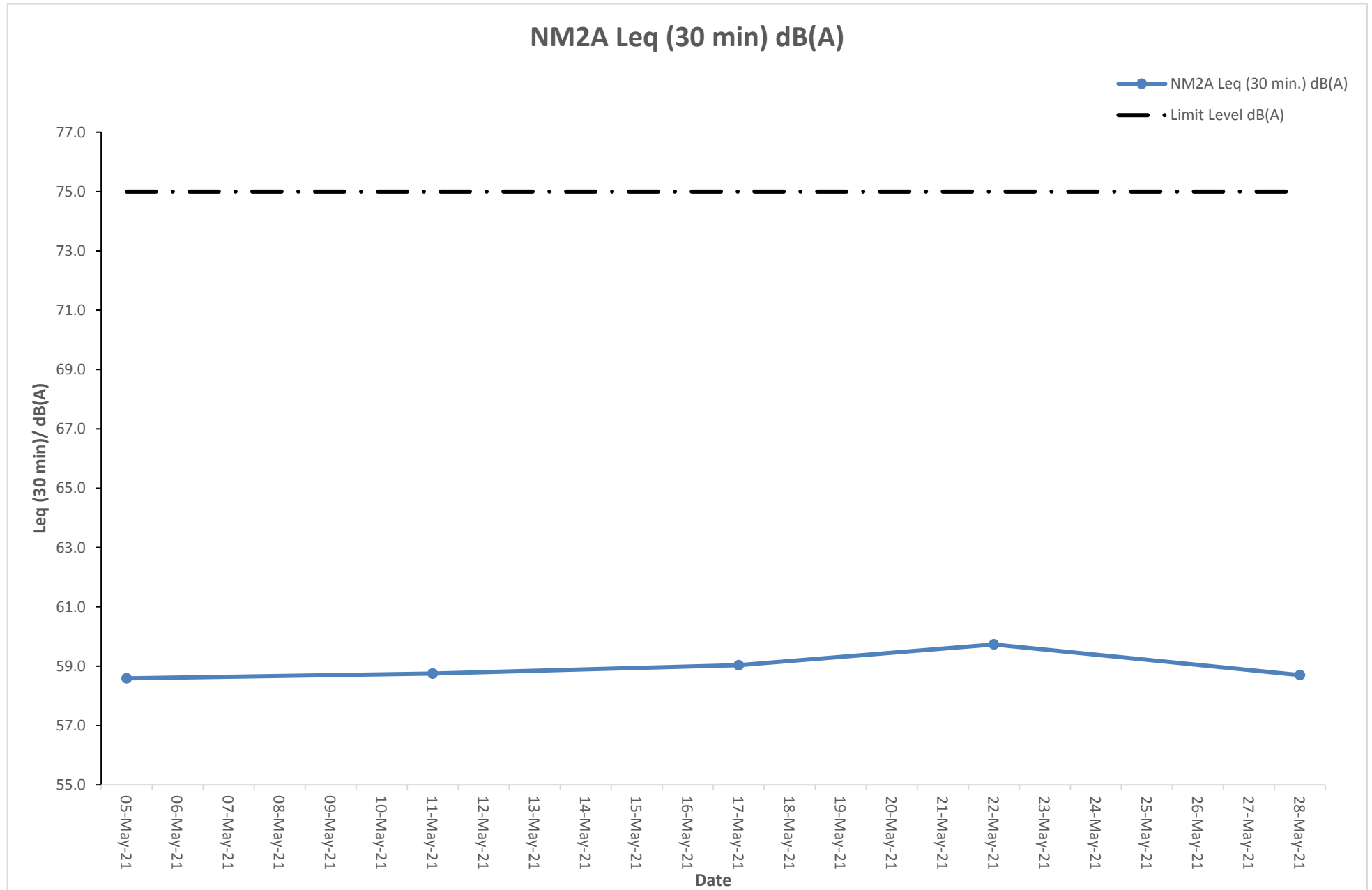
Noise Monitoring Result at Station NM2A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
05-May-21	8:31	64.1	55.9	58.6
05-May-21	8:36	62.4	57.5	
05-May-21	8:41	65.2	57.1	
05-May-21	8:46	63.8	57.0	
05-May-21	8:51	63.2	56.6	
05-May-21	8:56	63.1	57.6	
11-May-21	14:33	63.6	55.5	58.8
11-May-21	14:38	63.7	55.6	
11-May-21	14:43	63.1	55.5	
11-May-21	14:48	63.3	56.5	
11-May-21	14:53	64.7	57.3	
11-May-21	14:58	64.0	55.1	59.0
17-May-21	8:32	62.4	58.0	
17-May-21	8:37	63.2	55.5	
17-May-21	8:42	63.7	56.9	
17-May-21	8:47	62.5	55.8	
17-May-21	8:52	62.9	55.6	
17-May-21	8:57	64.2	55.7	59.7
22-May-21	14:35	65.1	56.3	
22-May-21	14:40	64.8	56.9	
22-May-21	14:45	62.9	55.1	
22-May-21	14:50	62.6	57.1	
22-May-21	14:55	63.6	58.0	
22-May-21	15:00	62.6	57.7	58.7
28-May-21	8:40	62.6	57.8	
28-May-21	8:45	63.7	55.5	
28-May-21	8:50	62.5	55.7	
28-May-21	8:55	63.3	57.0	
28-May-21	9:00	62.4	56.1	
28-May-21	9:05	62.7	55.5	



The station set-up of a façade measurement at station NM2A.

Graphical Presentation of Noise Monitoring Result at Station NM2A



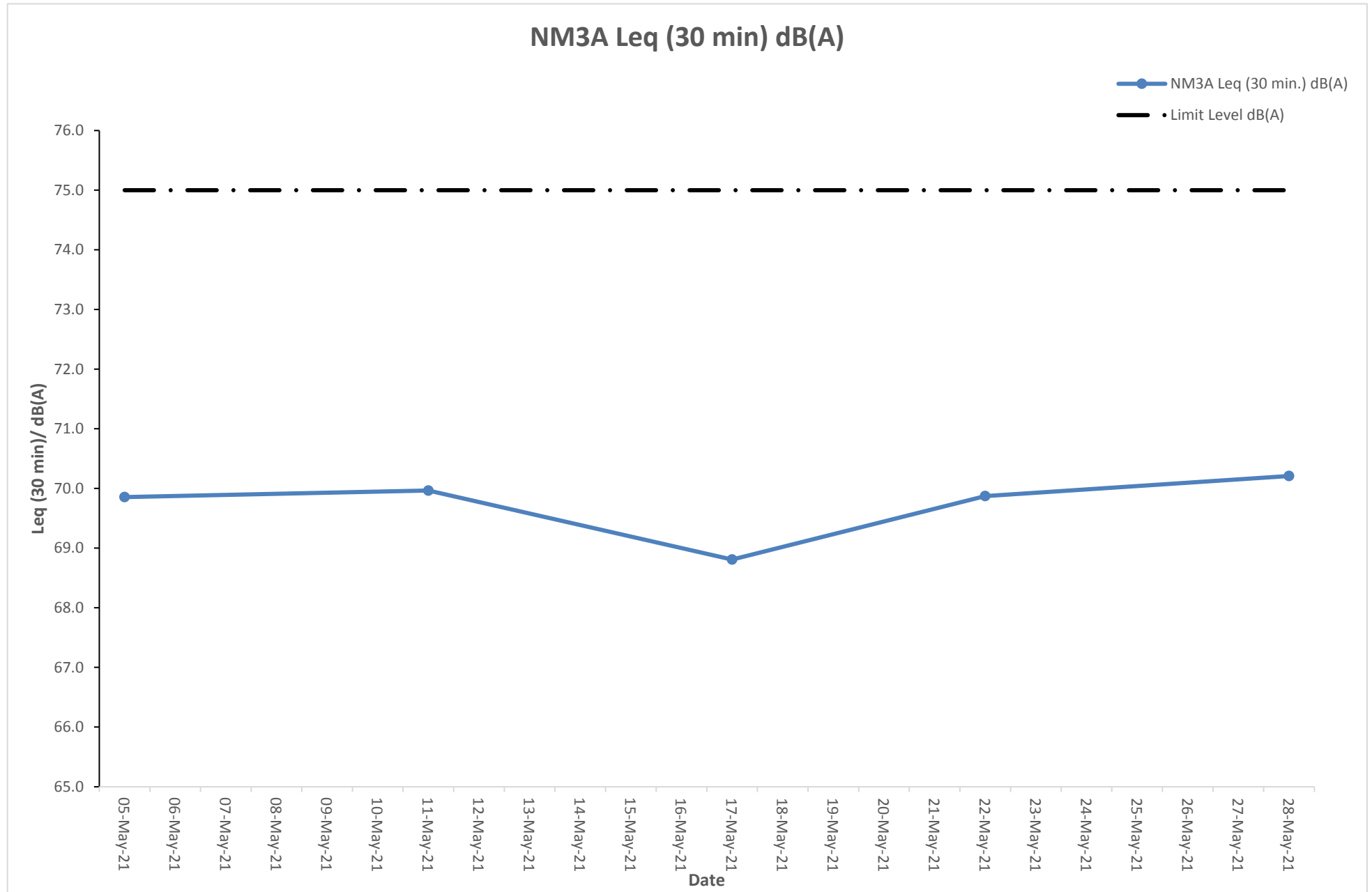
Noise Monitoring Result at Station NM3A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
05-May-21	10:01	73.9	67.1	69.9
05-May-21	10:06	73.7	69.3	
05-May-21	10:11	72.1	69.9	
05-May-21	10:16	74.4	68.3	
05-May-21	10:21	72.5	67.3	
05-May-21	10:26	72.1	67.2	
11-May-21	16:06	74.3	69.2	70.0
11-May-21	16:11	73.7	69.6	
11-May-21	16:16	72.3	68.0	
11-May-21	16:21	74.7	68.7	
11-May-21	16:26	72.4	67.4	
11-May-21	16:31	74.6	67.4	
17-May-21	10:02	74.7	67.5	68.8
17-May-21	10:07	72.6	68.2	
17-May-21	10:12	72.2	67.5	
17-May-21	10:17	72.1	67.5	
17-May-21	10:22	74.4	68.1	
17-May-21	10:27	73.4	68.9	
22-May-21	16:08	74.3	67.4	69.9
22-May-21	16:13	73.6	68.4	
22-May-21	16:18	73.6	69.1	
22-May-21	16:23	74.1	67.3	
22-May-21	16:28	74.4	68.2	
22-May-21	16:33	72.7	67.7	
28-May-21	10:10	74.0	70.0	70.2
28-May-21	10:15	74.3	68.4	
28-May-21	10:20	74.7	67.2	
28-May-21	10:25	72.1	69.2	
28-May-21	10:30	73.9	69.1	
28-May-21	10:35	72.8	68.0	



The station set-up of a façade measurement at station NM3A.

Graphical Presentation of Noise Monitoring Result at Station NM3A



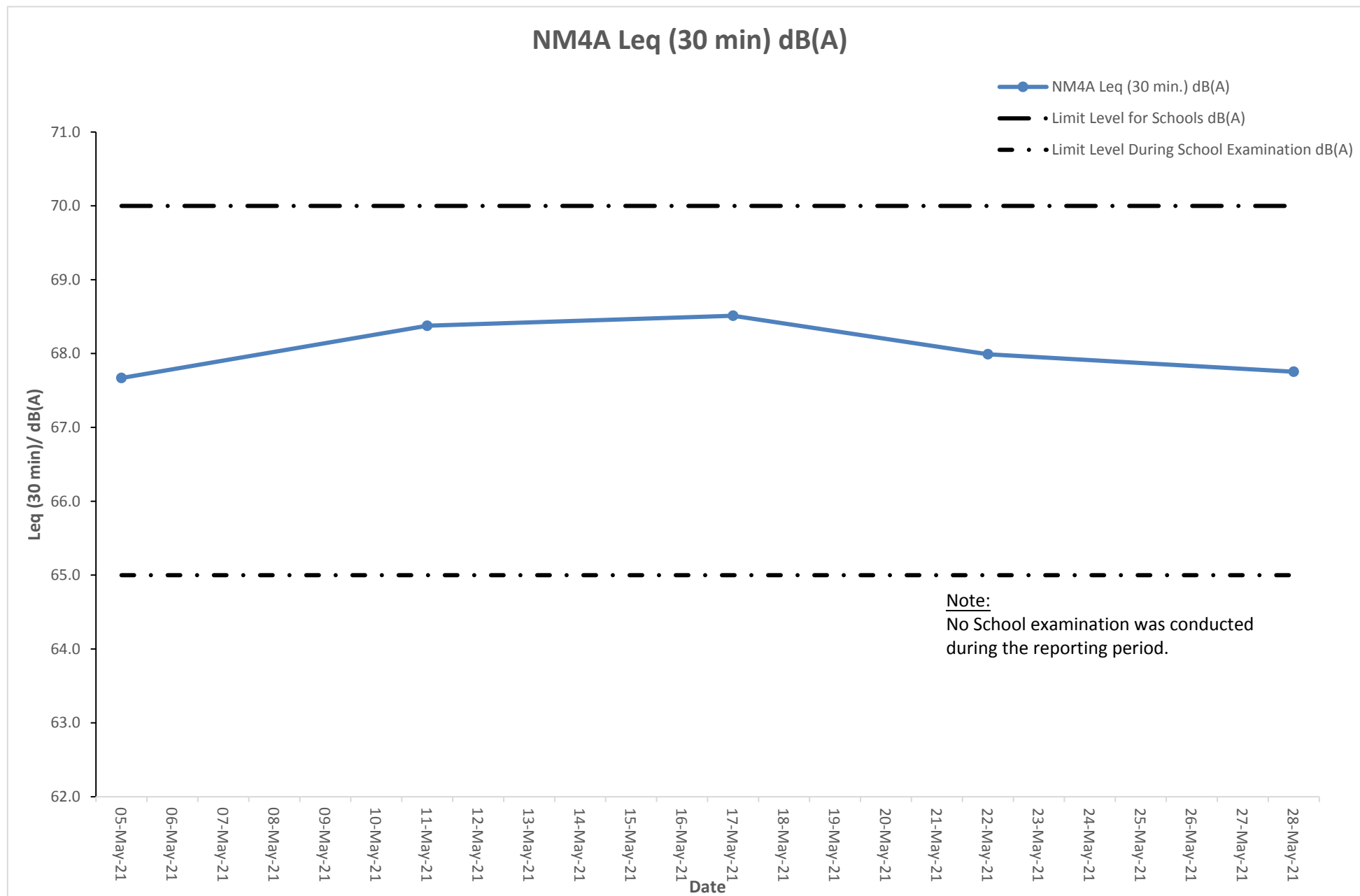
Noise Monitoring Result at Station NM4A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
05-May-21	10:36	69.6	66.5	67.7
05-May-21	10:41	69.4	65.6	
05-May-21	10:46	68.5	66.4	
05-May-21	10:51	67.9	65.0	
05-May-21	10:56	69.3	64.1	
05-May-21	11:01	67.2	65.0	
11-May-21	16:41	69.9	65.1	68.4
11-May-21	16:46	68.7	66.2	
11-May-21	16:51	68.3	65.3	
11-May-21	16:56	69.0	65.7	
11-May-21	17:01	69.3	66.7	
11-May-21	17:06	69.8	64.6	
17-May-21	10:37	69.5	66.5	68.5
17-May-21	10:42	69.7	66.5	
17-May-21	10:47	67.5	64.6	
17-May-21	10:52	69.6	64.9	
17-May-21	10:57	69.5	66.2	
17-May-21	11:02	68.1	66.7	
22-May-21	16:43	69.0	66.0	68.0
22-May-21	16:48	69.2	64.3	
22-May-21	16:53	69.8	65.9	
22-May-21	16:58	67.1	64.2	
22-May-21	17:03	68.4	65.7	
22-May-21	17:08	69.3	66.5	
28-May-21	10:45	69.4	66.7	67.8
28-May-21	10:50	67.8	66.2	
28-May-21	10:55	68.5	64.6	
28-May-21	11:00	69.4	65.3	
28-May-21	11:05	69.5	65.5	
28-May-21	11:10	68.4	64.7	



The station set-up of a façade measurement at station NM4A.

Graphical Presentation of Noise Monitoring Result at Station NM4A



Noise Monitoring Result at Station NM5A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)	Leq (30 min.) +3 dB(A)
05-May-21	9:21	66.9	61.1	63.2	66.2
05-May-21	9:26	64.8	59.9		
05-May-21	9:31	64.6	61.2		
05-May-21	9:36	65.2	60.8		
05-May-21	9:41	65.7	59.5		
05-May-21	9:46	64.1	59.9		
11-May-21	15:25	64.1	60.1	62.7	65.7
11-May-21	15:30	66.4	59.4		
11-May-21	15:35	64.6	59.1		
11-May-21	15:40	66.1	60.2		
11-May-21	15:45	64.7	61.1		
11-May-21	15:50	64.3	60.0		
17-May-21	9:22	64.9	59.5	62.6	65.6
17-May-21	9:27	65.5	60.6		
17-May-21	9:32	65.5	62.0		
17-May-21	9:37	64.2	61.0		
17-May-21	9:42	65.5	61.5		
17-May-21	9:47	66.2	60.9		
22-May-21	15:27	65.1	61.9	64.0	67.0
22-May-21	15:32	65.6	60.1		
22-May-21	15:37	66.3	59.1		
22-May-21	15:42	65.9	59.2		
22-May-21	15:47	66.2	59.6		
22-May-21	15:52	64.8	61.9		
28-May-21	9:30	65.8	61.6	63.1	66.1
28-May-21	9:35	65.0	60.8		
28-May-21	9:40	66.8	59.3		
28-May-21	9:45	64.7	61.7		
28-May-21	9:50	64.4	60.1		
28-May-21	9:55	65.0	60.7		

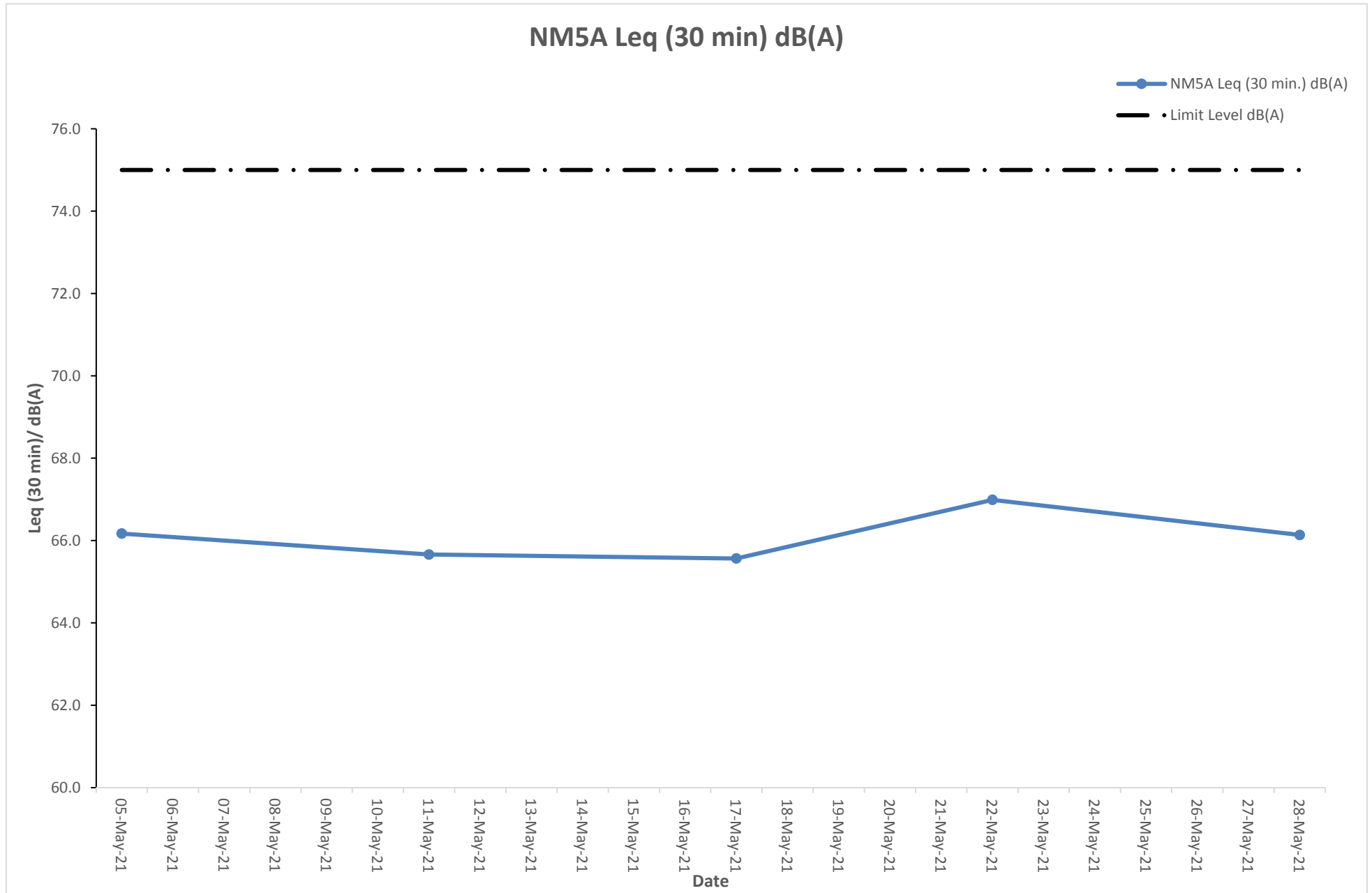
Remarks:

+3dB(A) correction was applied to free-field measurement.



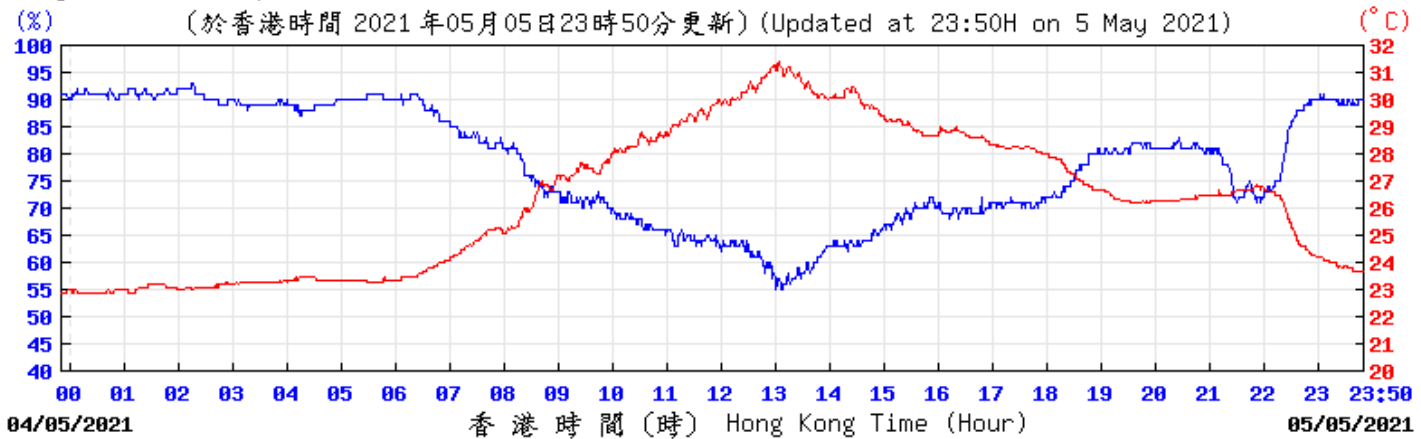
The station set-up of a free-field measurement at station NM5A.

Graphical Presentation of Noise Monitoring Result at Station NM5A



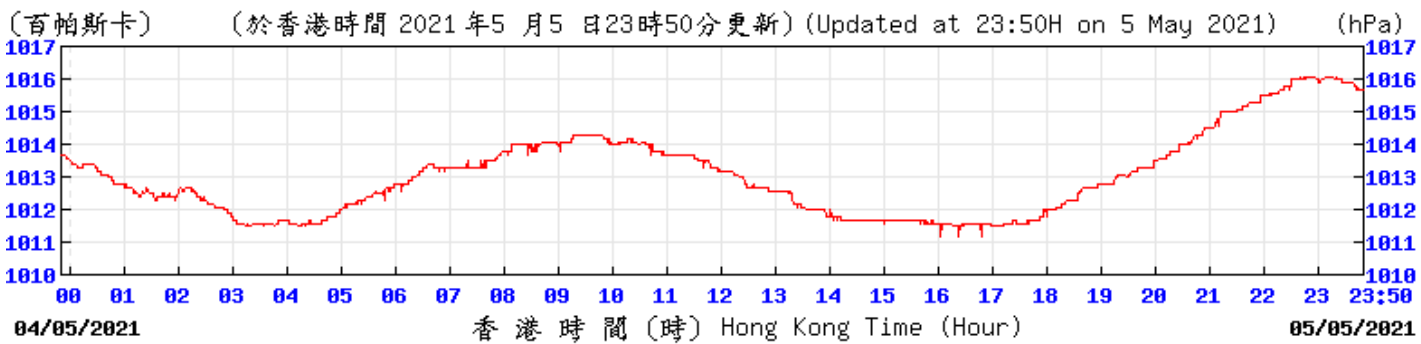
H. Meteorological Data Extracted from Hong Kong Observatory

Temperature/Humidity:



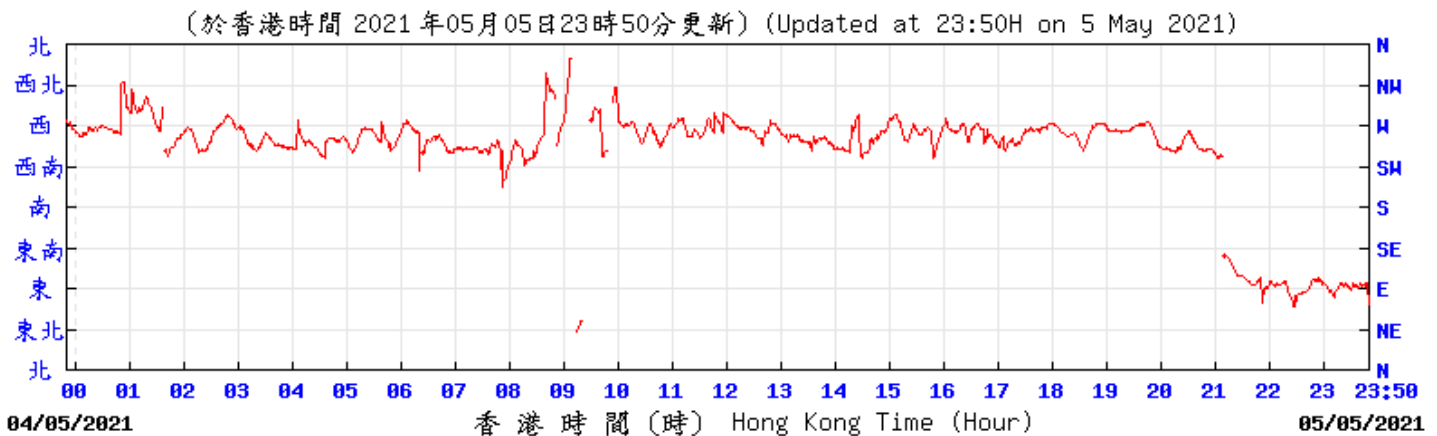
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Pressure:



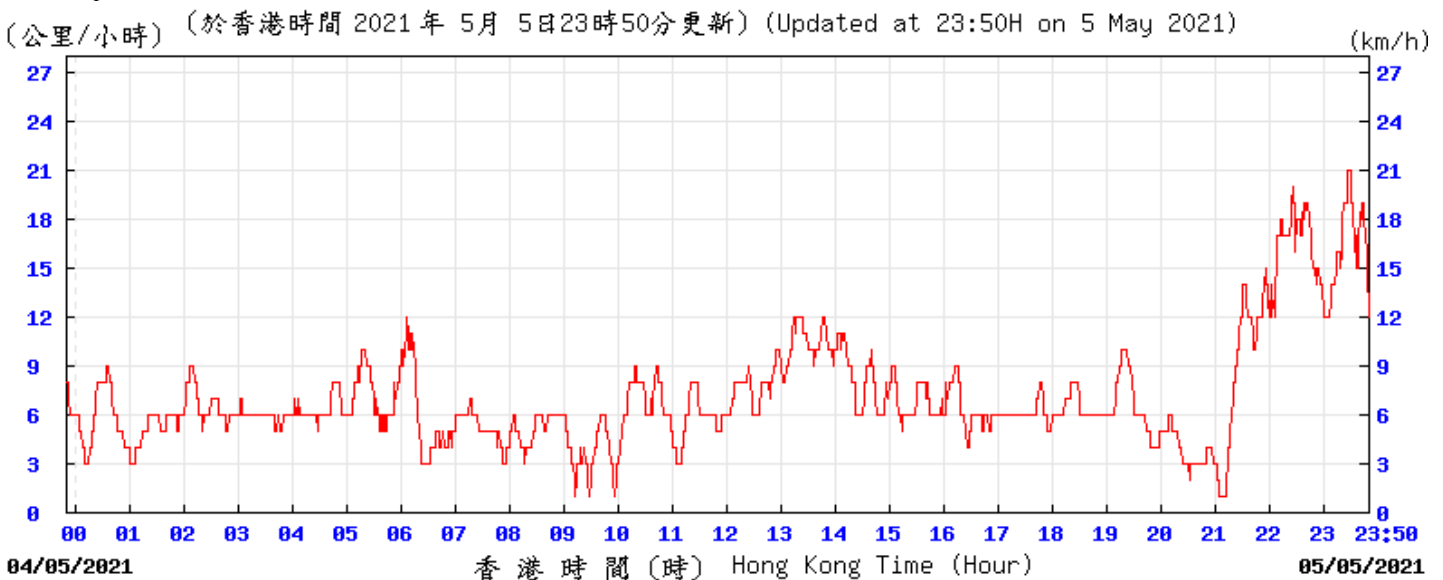
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Wind Direction:



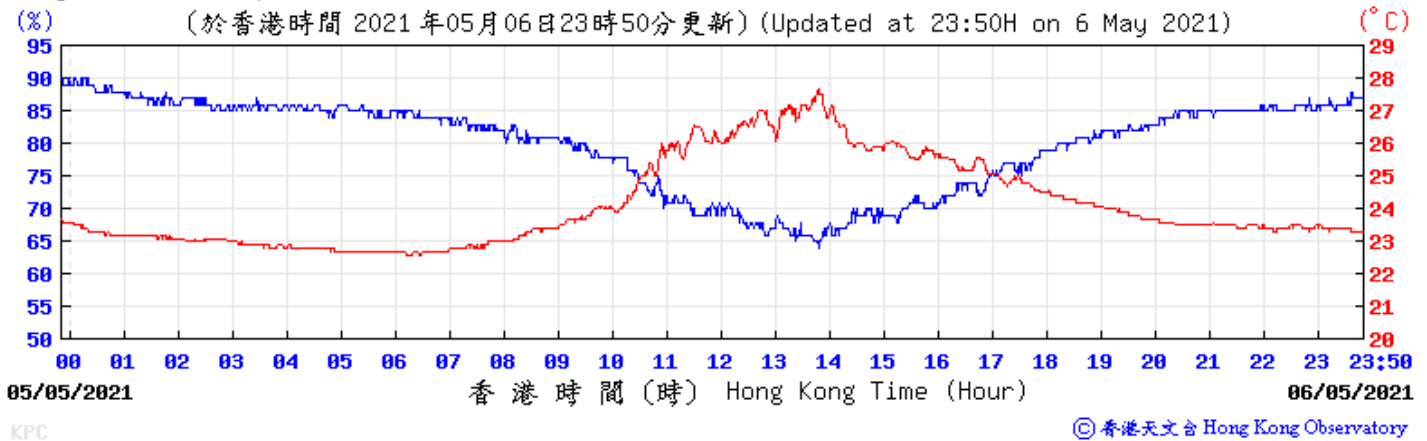
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Wind Speed:

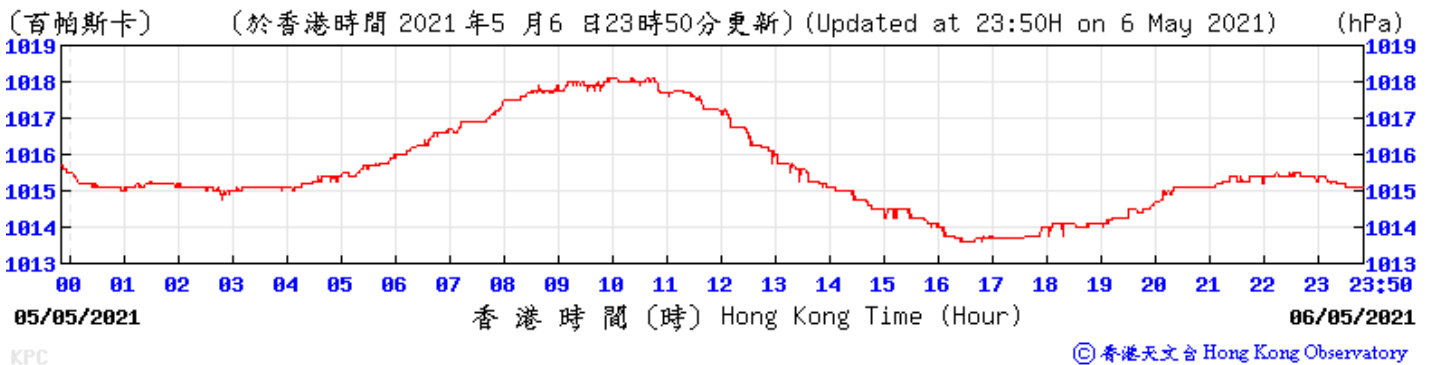


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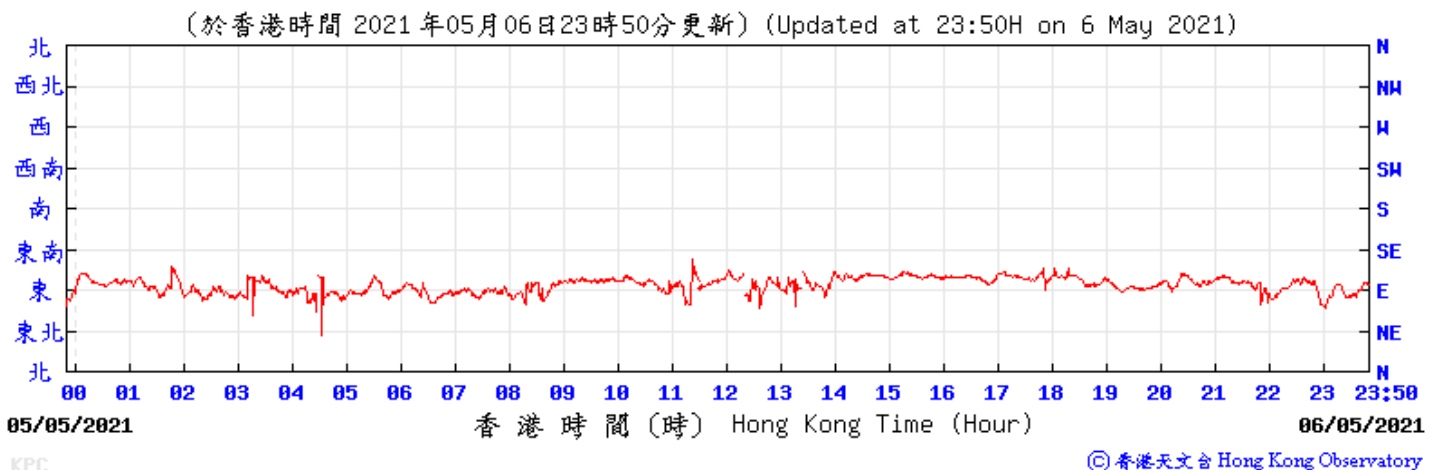
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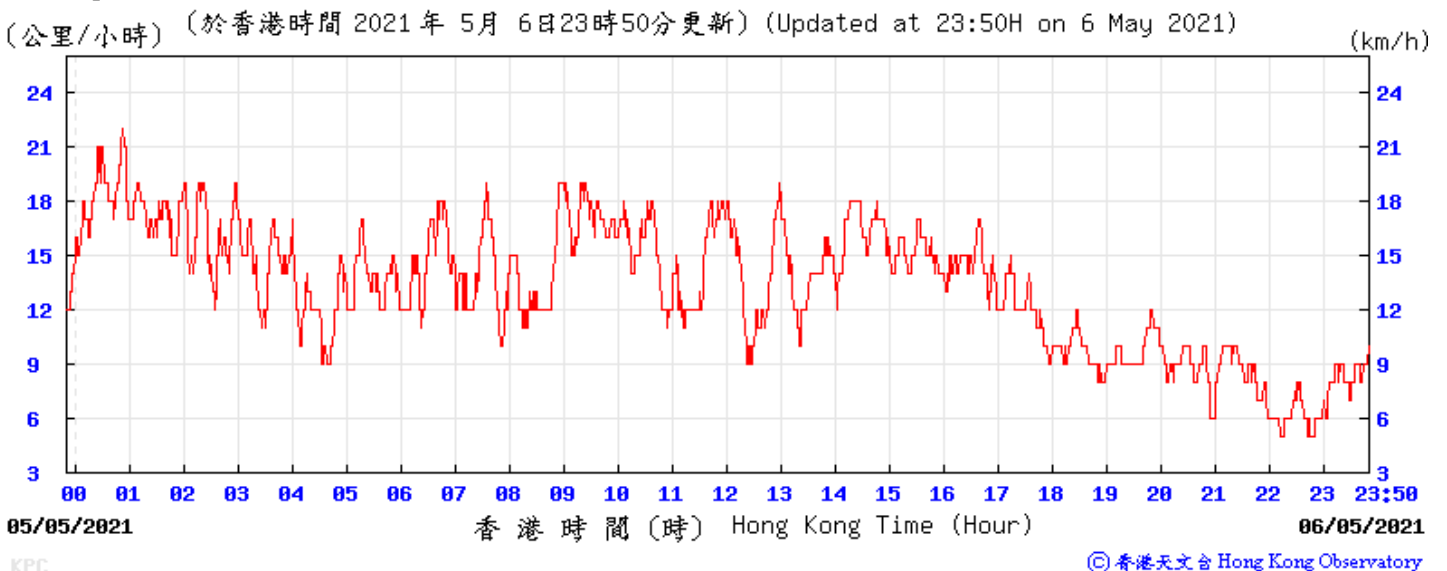
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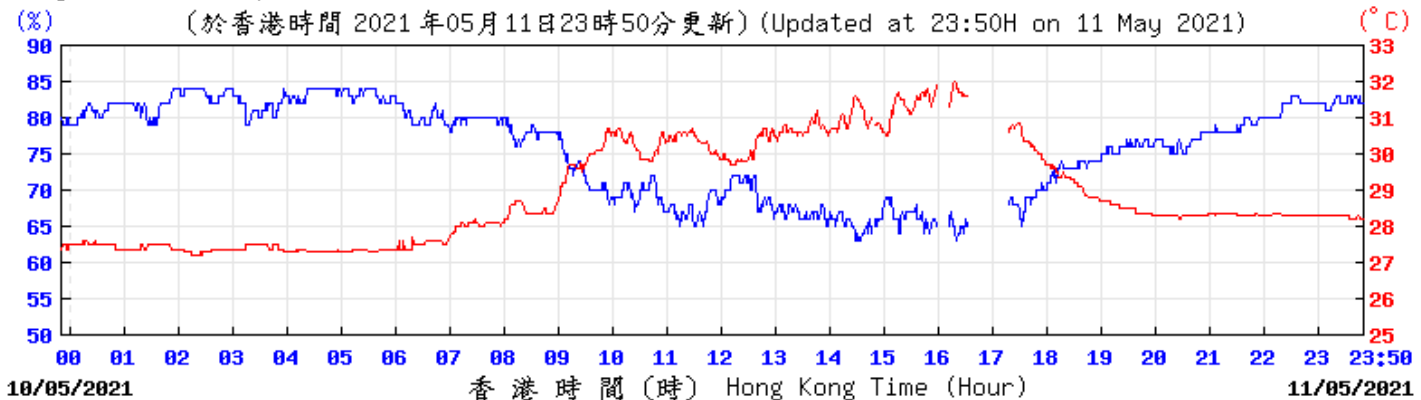
Wind Direction:



Wind Speed:

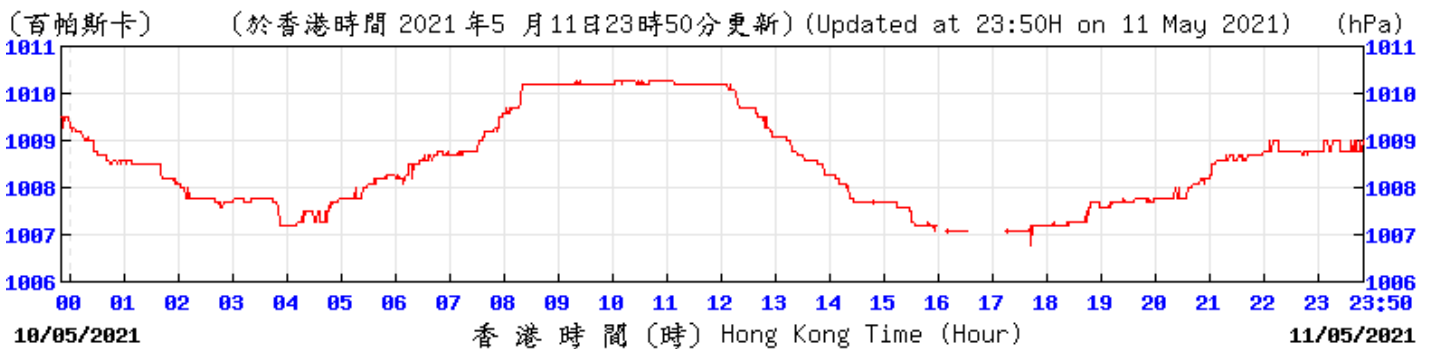


Temperature/Humidity:



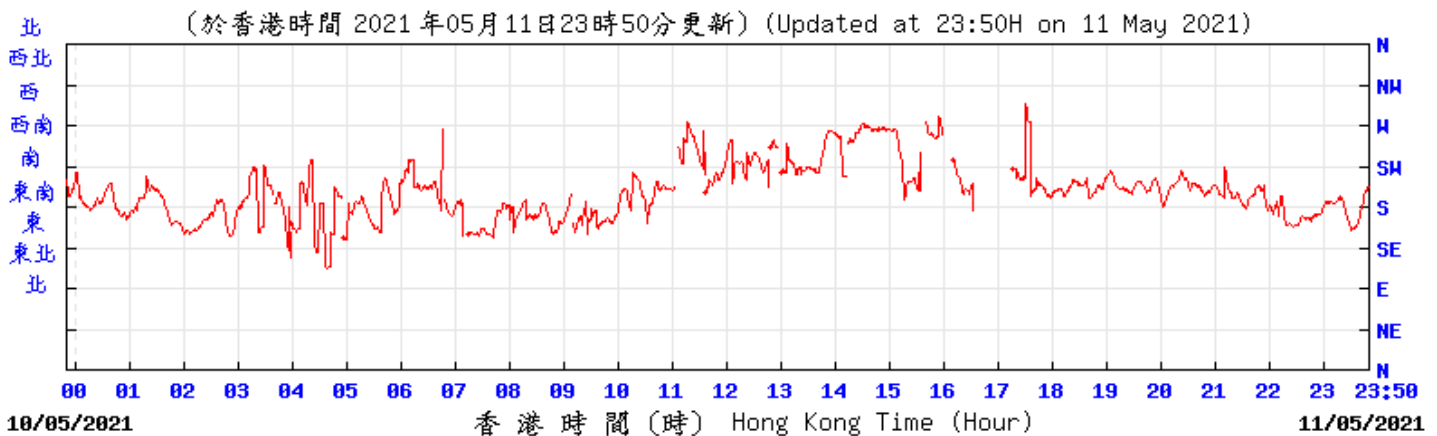
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Pressure:



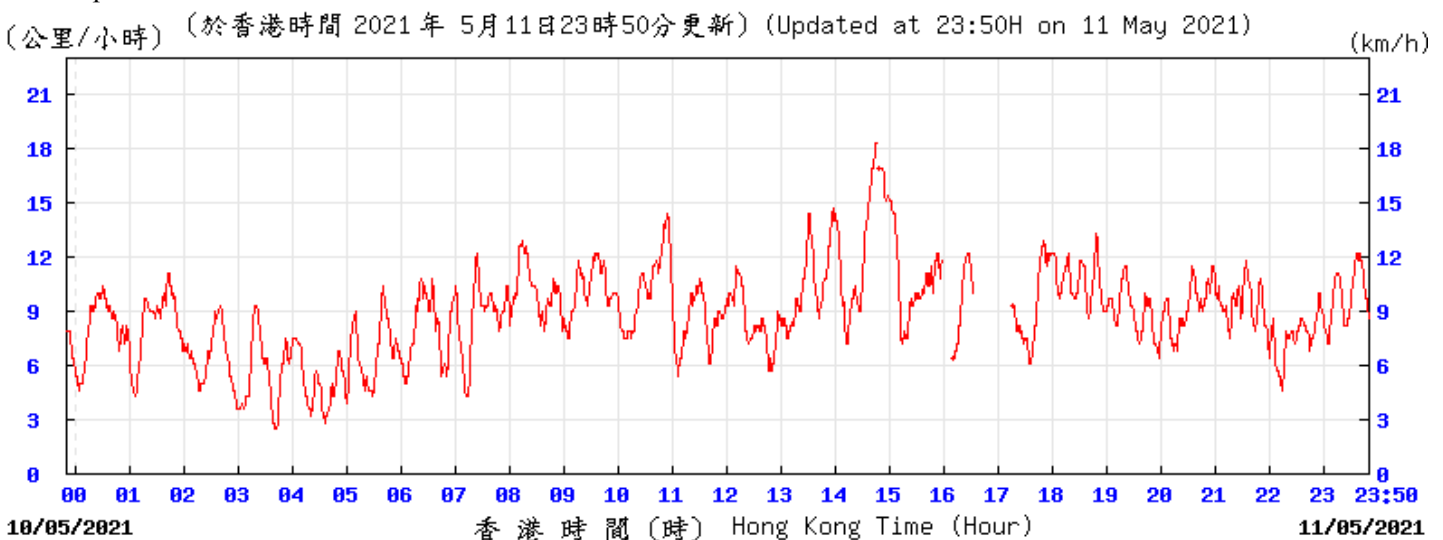
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Wind Direction:



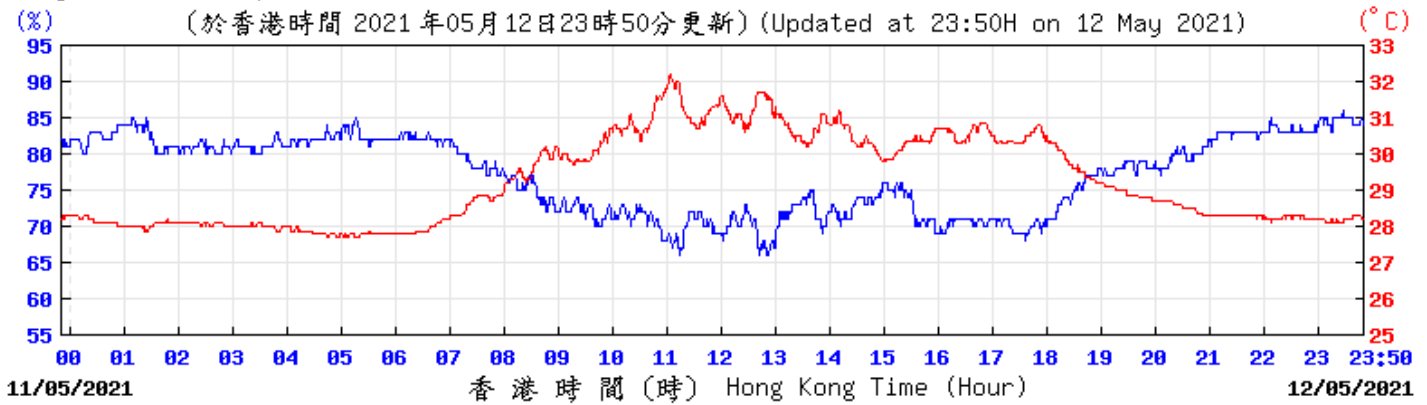
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Wind Speed:



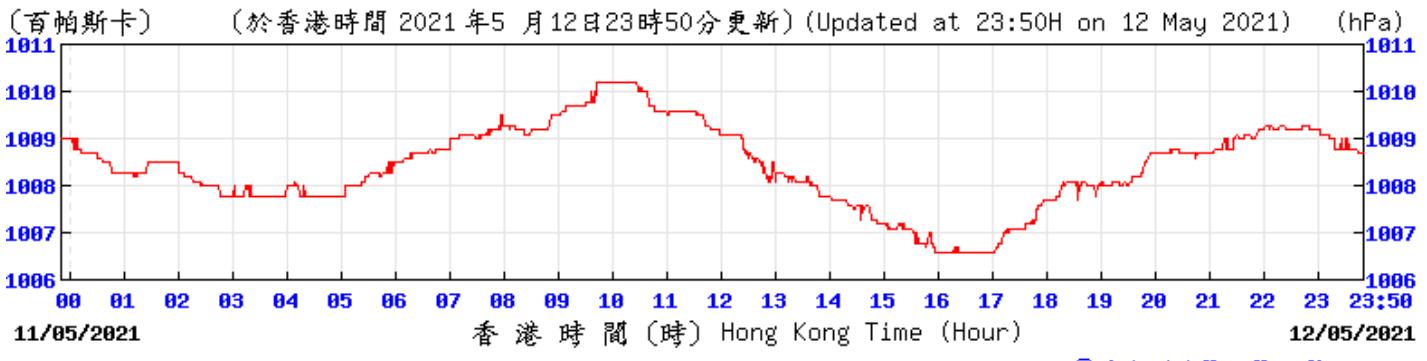
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Temperature/Humidity:



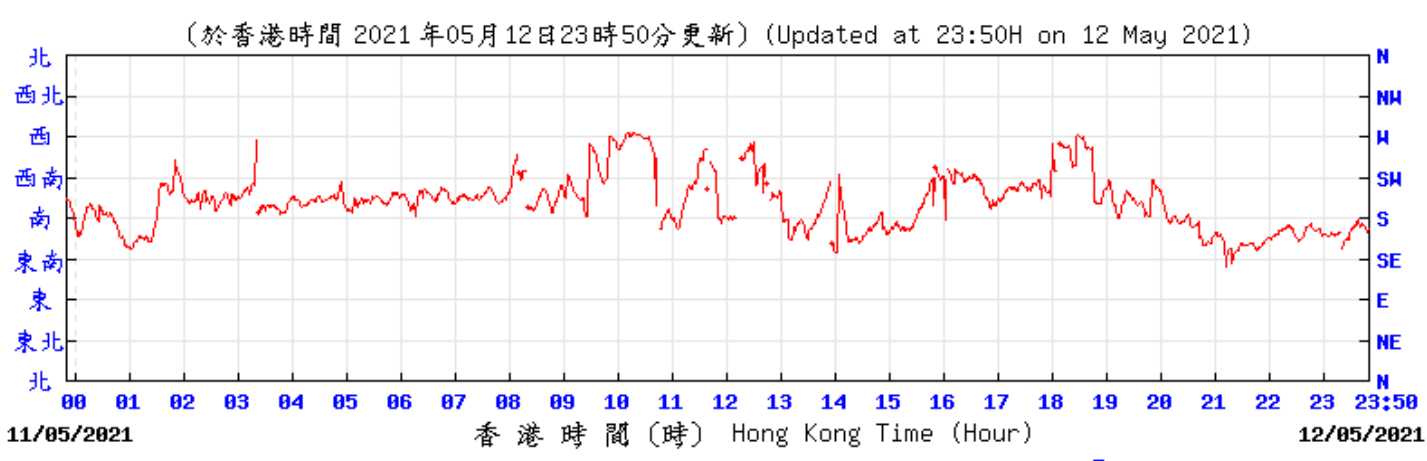
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KPC Pressure:



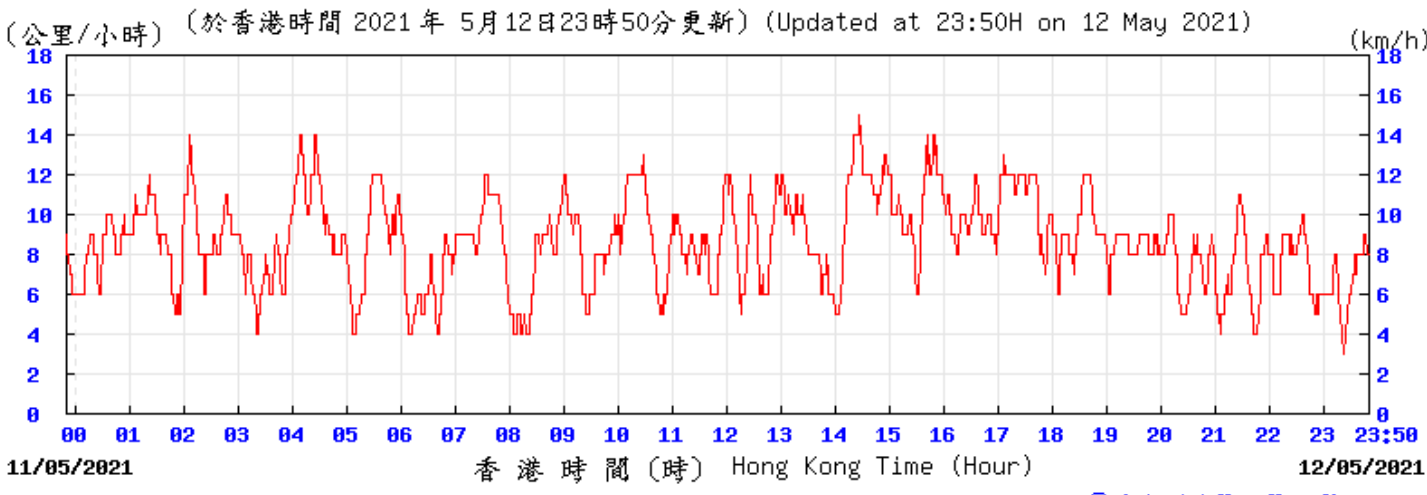
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KPC Wind Direction:



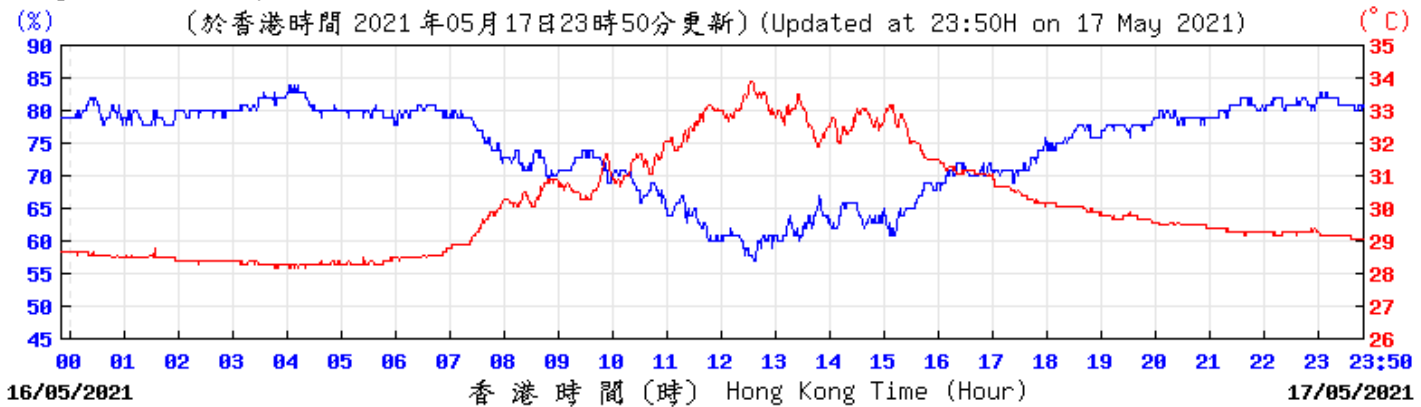
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KPC Wind Speed:



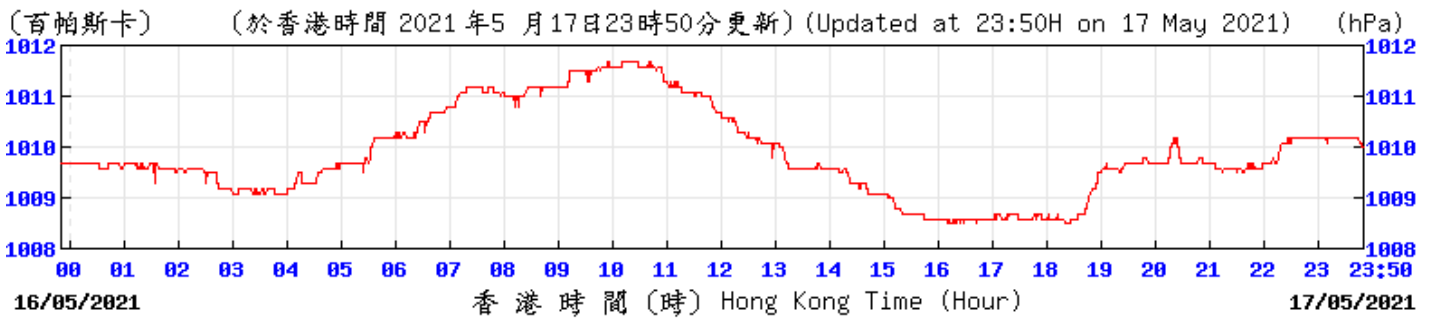
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Temperature/Humidity:



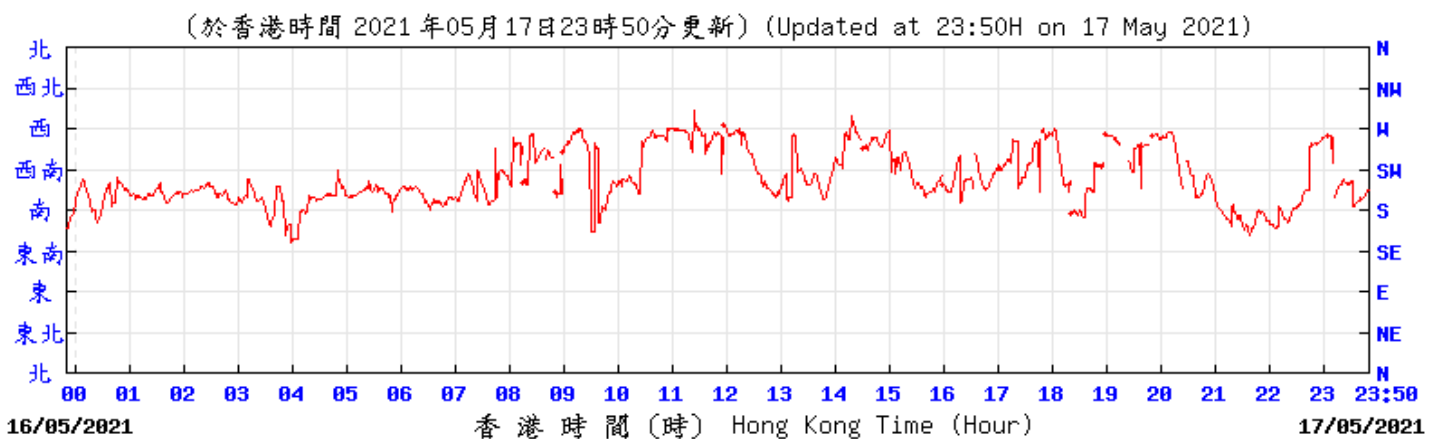
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Pressure:



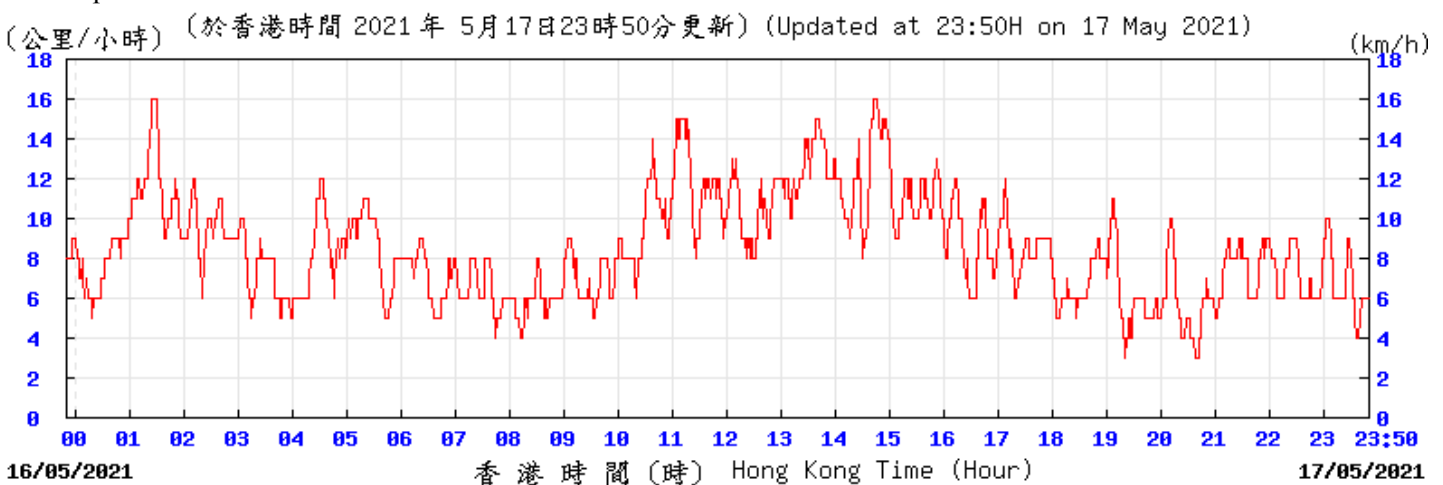
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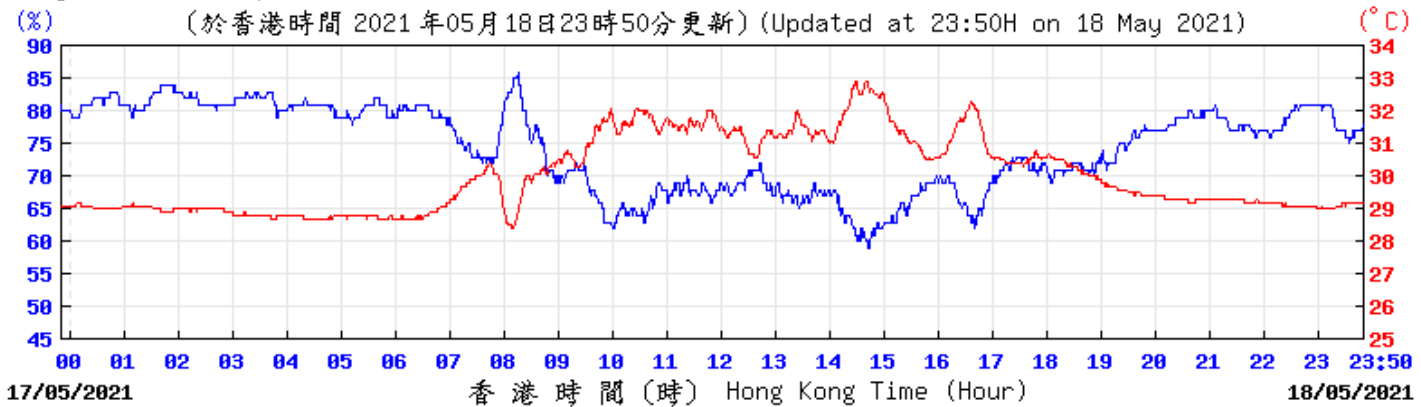
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Wind Speed:



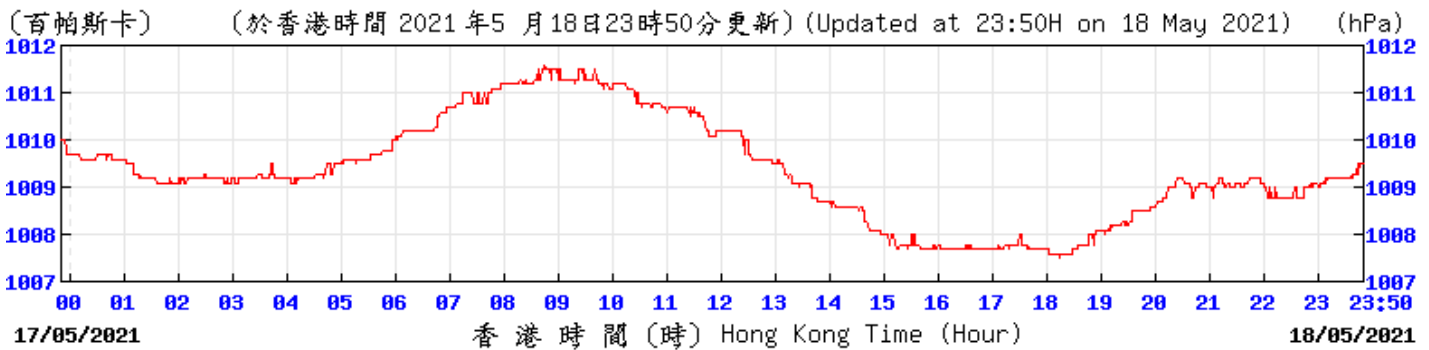
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Temperature/Humidity:



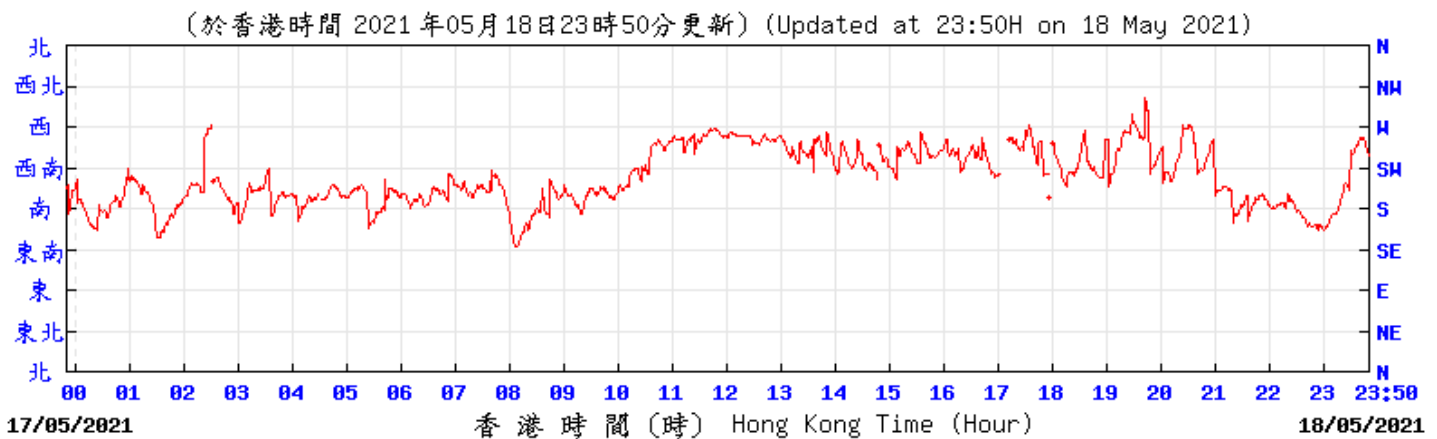
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Pressure:



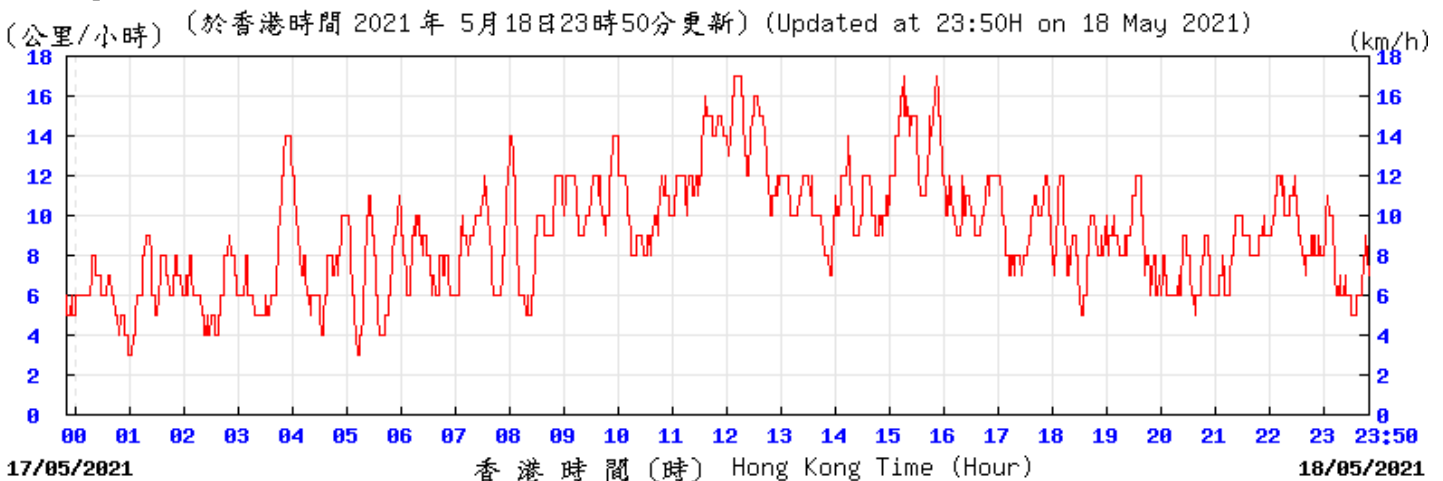
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Wind Direction:



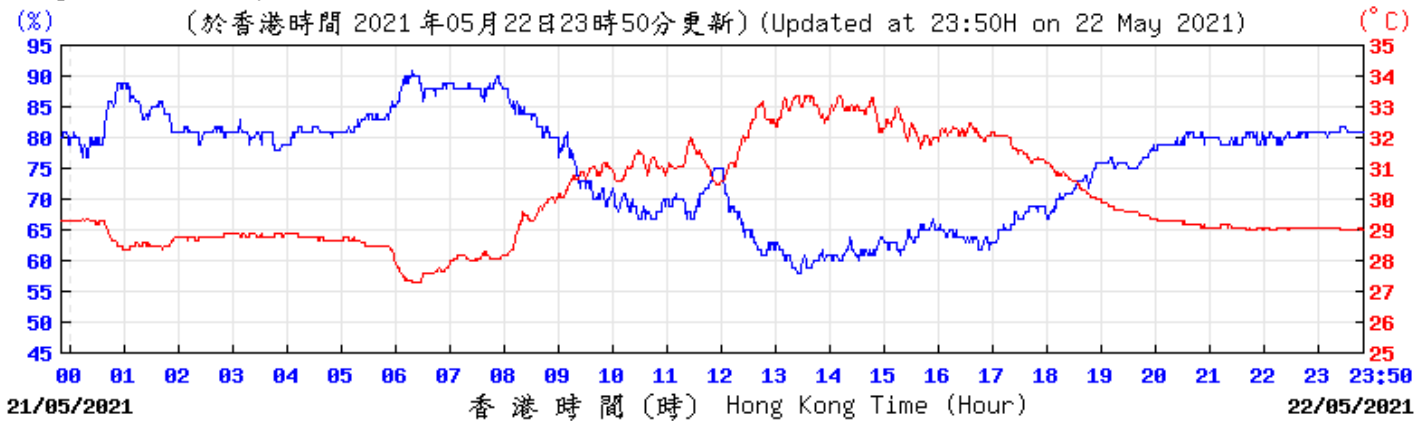
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Wind Speed:



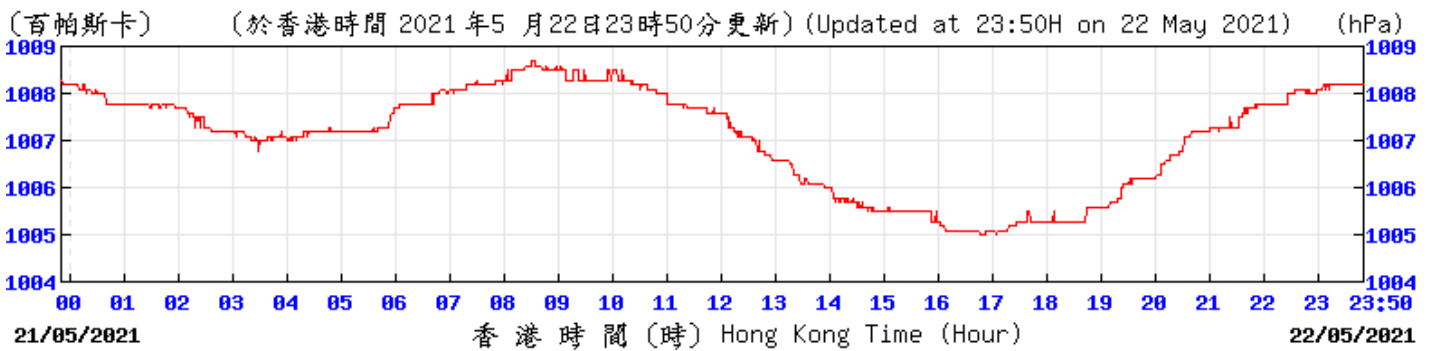
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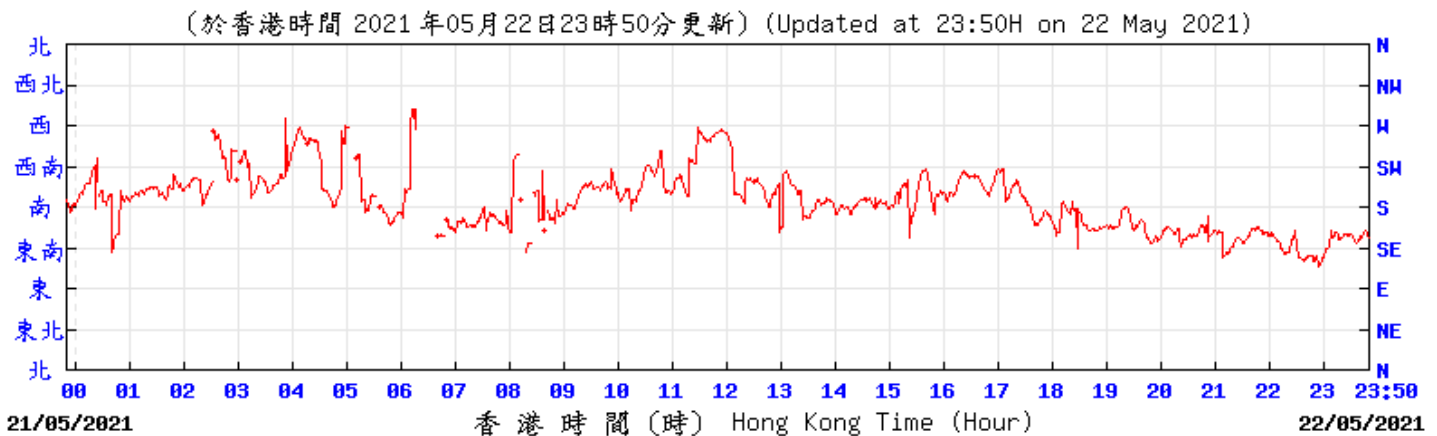
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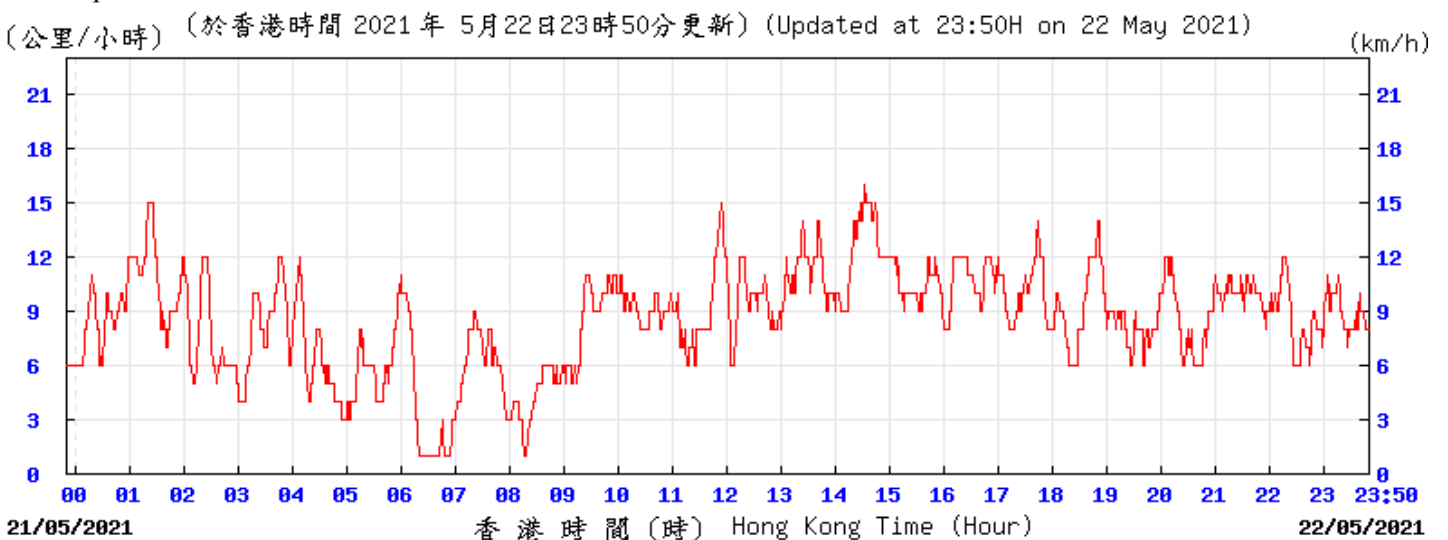
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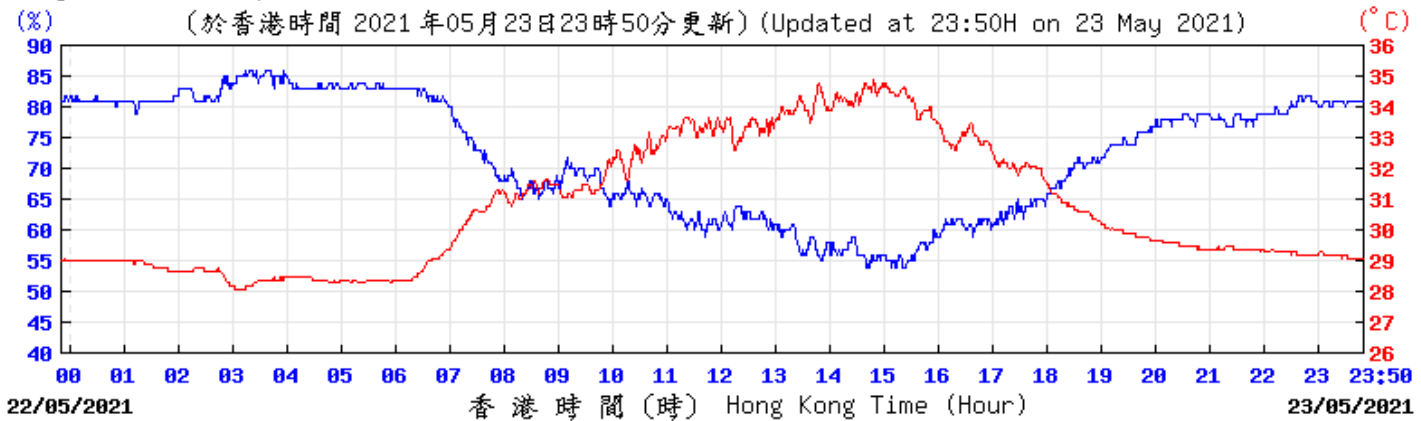
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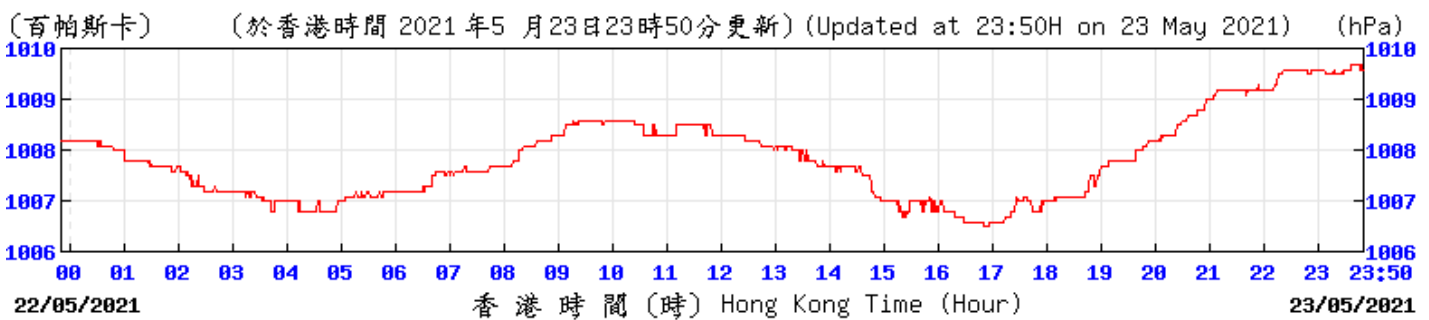
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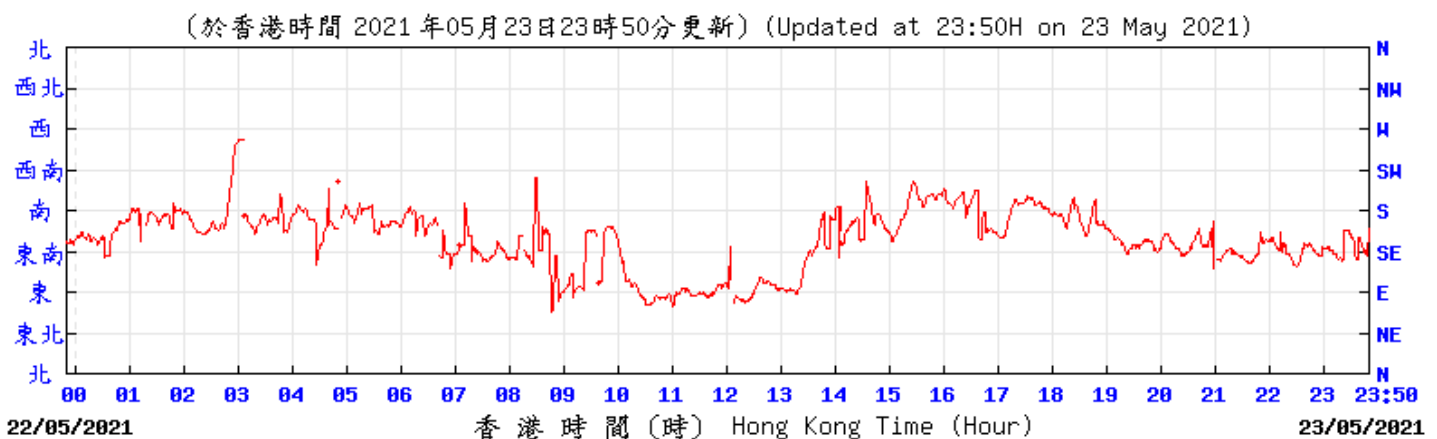
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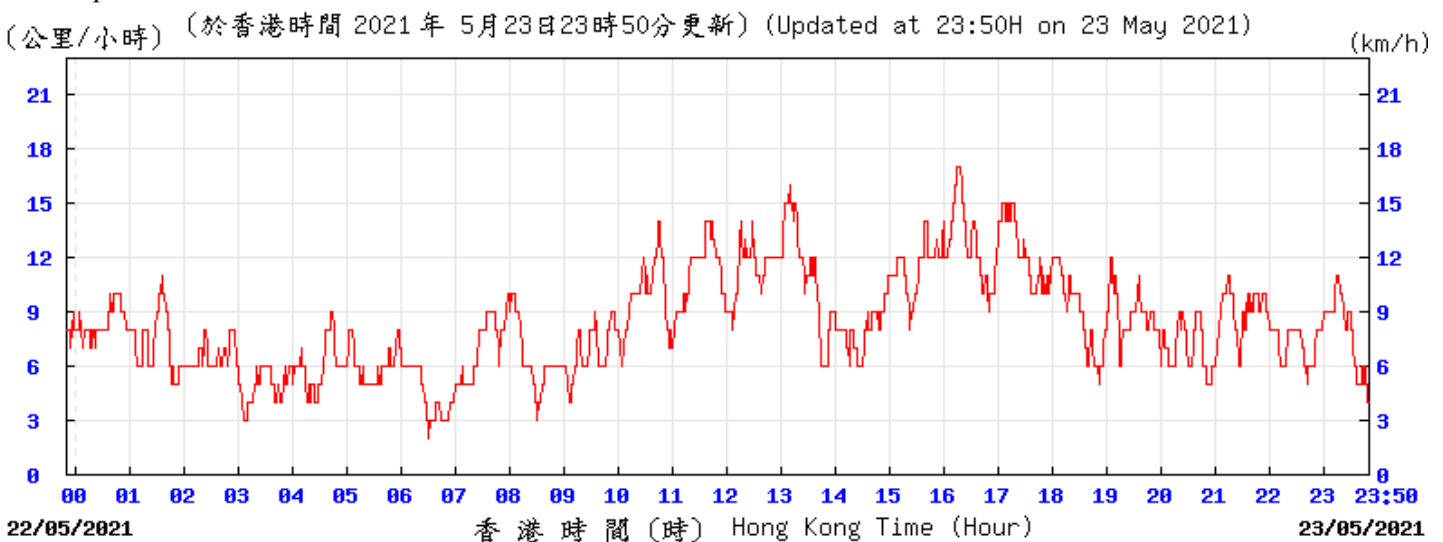
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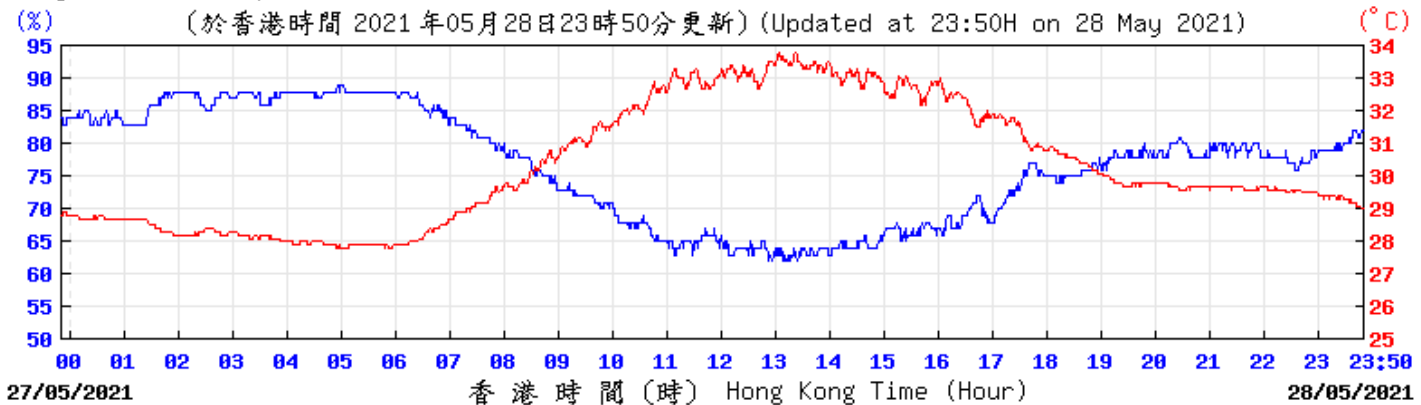
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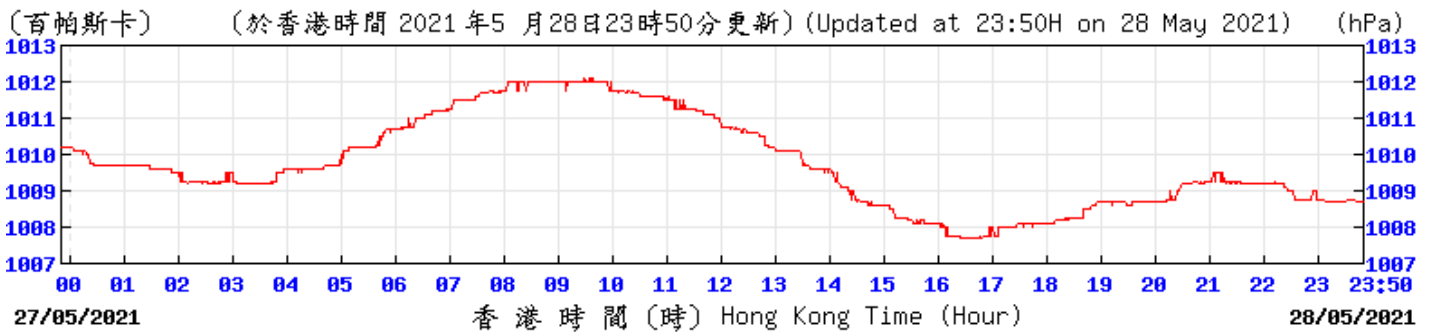
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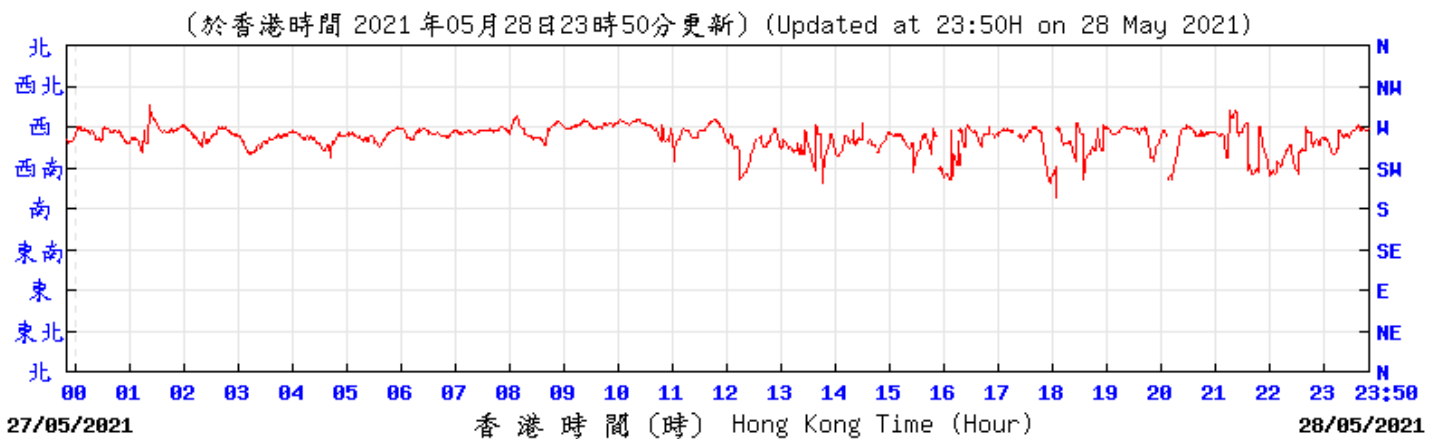
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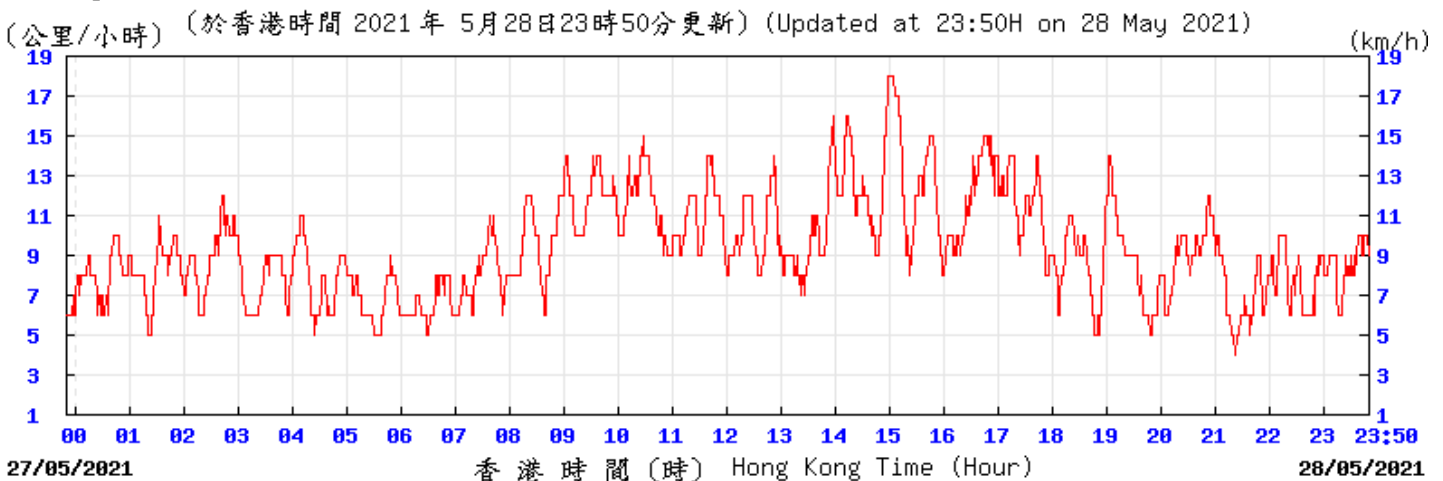
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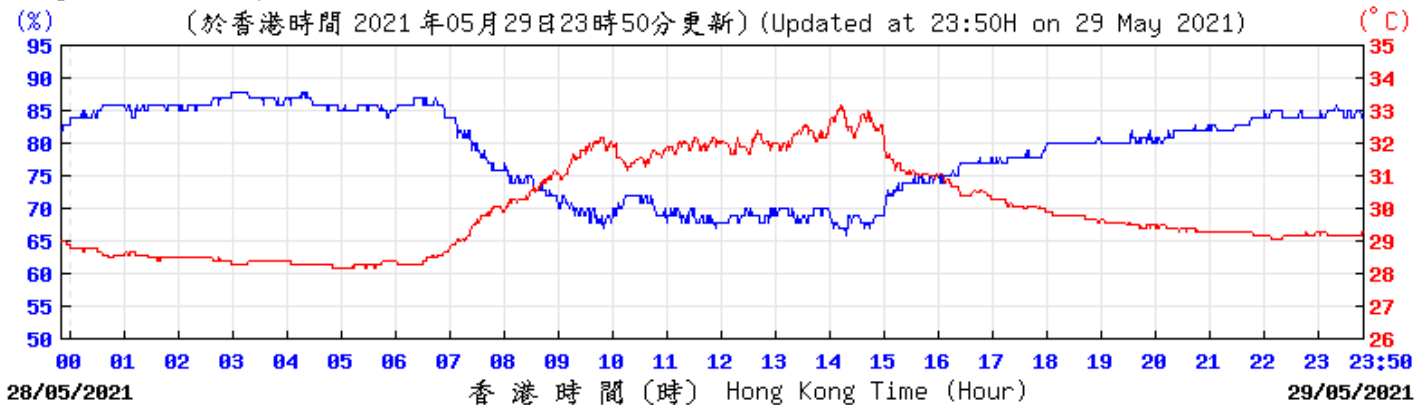
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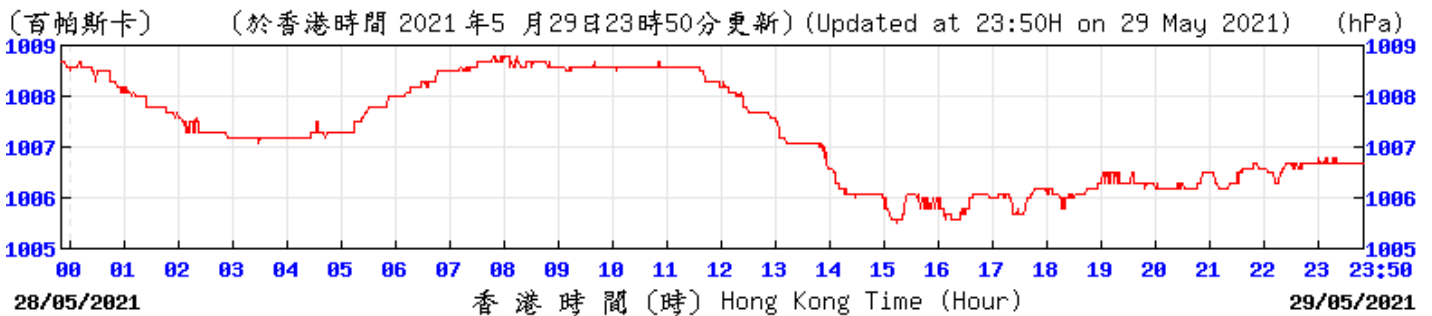
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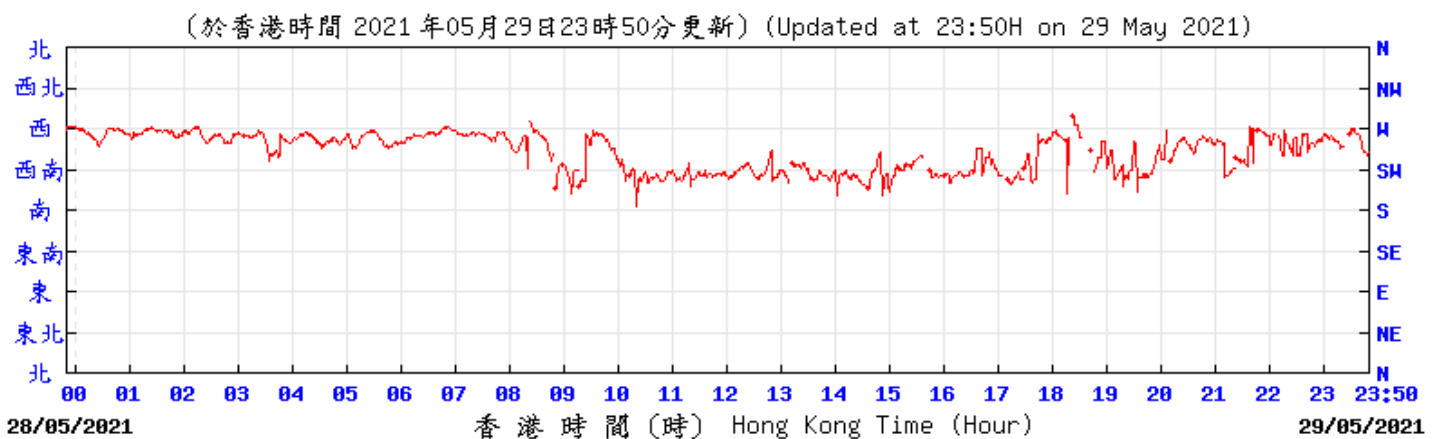
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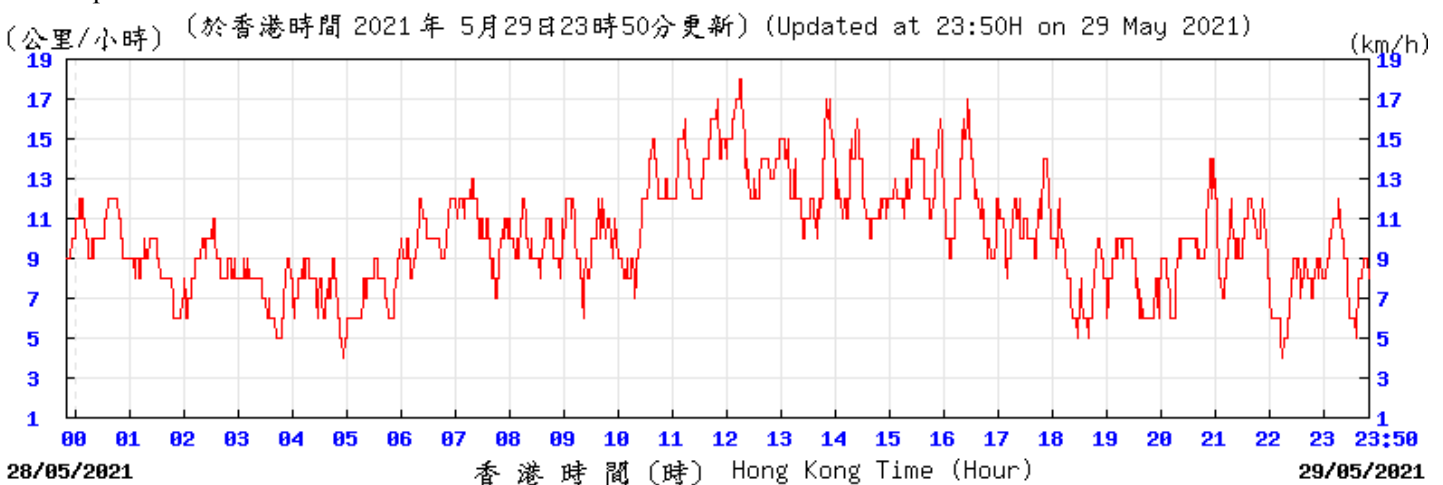
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I. Waste Flow table

Table I-1: Monthly Waste Flow Table for Zone 2A

Month	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Materials Generated Monthly					
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Disposed to Srotting Facility	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Wood/ Timber	Chemical Waste	Others, e.g. General Refuse
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)
2020													
Oct	2623.48	0.00	0.00	0.00	2623.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.94
Nov	8838.69	0.00	685.23	1198.56	6954.90	0.00	1194.93	0.00	0.00	0.00	0.00	0.00	17.49
Dec	8890.70	0.00	510.59	1675.21	6704.90	0.00	51.51	0.00	0.00	0.00	0.00	0.00	11.75
Sub-total (2020)	20352.87	0.00	1195.82	2873.77	16283.28	0.00	1246.44	0.00	0.00	0.00	0.00	0.00	51.18
2021													
Jan	6849.66	0.00	52.90	0.00	6796.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.94
Feb	4591.95	0.00	0.00	0.00	4591.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.11
Mar	7318.44	0.00	0.00	339.94	6978.50	0.00	0.00	75.57	0.00	0.00	0.00	0.20	15.79
Apr	7208.22	0.00	0.00	1109.51	6098.71	0.00	0.00	0.00	0.00	0.00	0.00	0.40	19.29
May	7976.23	0.00	0.00	1853.51	6122.72	0.00	0.00	125.49	0.00	0.00	0.00	0.20	18.43
Sub-total (2021)	33944.50	0.00	52.90	3302.96	30588.64	0.00	0.00	201.06	0.00	0.00	0.00	0.80	89.56
Total	55543.81	0.00	1248.72	6176.73	46871.92	0.00	1246.44	201.06	0.00	0.00	0.00	0.80	140.74

Note:

- 247.92 tonnes, 5874.80 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, and Tuen Mun Area 38 respectively in the reporting month.

- For inert C&D materials reused in other projects, the projects refer to (1) EcoPark at Tuen Mun.

J. Environmental Mitigation Measures – Implementation Status

Table J-1: Environmental Mitigation Measures Implementation Status (May 2021)

EM&A Ref.	Recommendation Measures	Implementation Stage
Air Quality Impact (Construction)		
2.1	<p>General Dust Control Measures Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)</p>	✓
2.1	<p>Best Practice For Dust Control The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: <i>Good Site Management</i></p> <ul style="list-style-type: none"> • Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> • Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or • Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. <p><i>Exposed Earth</i></p> <ul style="list-style-type: none"> • Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. 	Obs, Rem
		✓
		Obs
		N/A
		No exposed earth in this project.

EM&A Ref.	Recommendation Measures	Implementation Stage
	<i>Loading, Unloading or Transfer of Dusty Materials</i>	✓
	<ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. 	
	<i>Debris Handling</i>	✓
	<ul style="list-style-type: none"> Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. 	N/A
		No debris chute on-site
	<i>Transport of Dusty Materials</i>	✓
	<ul style="list-style-type: none"> Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. 	
	<i>Wheel washing</i>	✓
	<ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. 	
	<i>Use of vehicles</i>	✓
	<ul style="list-style-type: none"> The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. 	
	<ul style="list-style-type: none"> Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. 	✓
	<ul style="list-style-type: none"> Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. 	✓
	<i>Site hoarding</i>	✓
	<ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. 	
2.1	Best Practicable Means for Cement Works (Concrete Batching Plant)	
	The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for	

EM&A Ref.	Recommendation Measures	Implementation Stage
	<p>Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Exhaust from Dust Arrestment Plant</i></p> <ul style="list-style-type: none"> Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection <p><i>Emission Limits</i></p> <ul style="list-style-type: none"> All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke <p><i>Engineering Design/Technical Requirements</i></p> <ul style="list-style-type: none"> As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions 	<p>N/A</p> <p>No concrete batching plant in this project.</p> <p>N/A</p> <p>No concrete batching plant in this project.</p> <p>N/A</p> <p>No concrete batching plant in this project.</p>
	<p>Non-Road Mobile Machinery (NRMM):</p> <p>All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels.</p>	<p>✓</p>
Noise Impact (Construction)		
3.1	<p>Good Site Practice</p> <p>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction:</p> <ul style="list-style-type: none"> only well-maintained plant to be operated on-site and plant should be serviced regularly during the 	<p>✓</p>

EM&A Ref.	Recommendation Measures	Implementation Stage
	<p>construction works;</p> <ul style="list-style-type: none"> • machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum • plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; • mobile plant should be sited as far away from NSRs as possible; and • material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
3.1	<p>Adoption of Quieter PME</p> <p>The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "Sound Power Levels of Other Commonly Used PME" are presented in Table 4.26 in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.</p>	✓
3.1	<p>Use of Movable Noise Barriers</p> <p>Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.</p>	Rem
3.1	<p>Use of Noise Enclosure/ Acoustic Shed</p> <p>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010.</p>	✓
3.1	<p>Use of Noise Insulating Fabric</p>	✓

EM&A	Recommendation Measures	Implementation Stage
Ref.	<p>Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.</p>	
3.1	<p>Scheduling of Construction Works outside School Examination Periods</p> <p>During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods.</p>	✓
Water Quality Impact (Construction)		
4.1	<p>Construction site runoff and drainage</p> <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> <li data-bbox="313 991 1653 1209">• At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; <li data-bbox="313 1230 1659 1355">• Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. 	✓ ✓

EM&A
Ref.

Recommendation Measures

Implementation Stage

Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction.

- All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. Obs
- Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ✓
- All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ✓
- Open stockpiles of construction materials or construction wastes onsite should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. Rem
- Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ✓
- Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken Obs

EM&A Ref.	Recommendation Measures	Implementation Stage
	<p>when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.</p> <ul style="list-style-type: none"> Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. 	<p>N/A No bentonite slurries are used in this project.</p>
4.1	<p>Barging facilities and activities</p> <p>Recommendations for good site practices during operation of the proposed barging point include:</p> <ul style="list-style-type: none"> All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site. 	<p>N/A No barging facilities in this project at this stage.</p> <p>N/A No barging facilities in this project at this stage.</p> <p>N/A No barging facilities in this project at this stage.</p> <p>N/A No barging facilities in this project at this stage.</p>
4.1	Sewage effluent from construction workforce	✓

EM&A
Ref.

Recommendation Measures

Implementation Stage

Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.

4.1 General construction activities

- Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used.
- Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.

Obs, Rem

✓

Waste Management Implications (Construction)

6.1 Good Site Practices

Recommendations for good site practices during the construction activities include:

- Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ✓
- Training of site personnel in proper waste management and chemical handling procedures ✓
- Provision of sufficient waste disposal points and regular collection of waste ✓
- Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ✓
- Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust ✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	<p>introduction to public roads</p> <ul style="list-style-type: none"> Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated 	✓
6.1	<p>Waste Reduction Measures</p> <p>Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> Sort inert C&D material to recover any recyclable portions such as metals Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force Proper site practices to minimise the potential for damage or contamination of inert C&D materials Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes 	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
6.1	<p>Inert and Non-inert C&D Materials</p> <p>In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.</p> <ul style="list-style-type: none"> The surplus inert C&D material will be disposed of at the Government’s PFRFs for beneficial use by other projects in Hong Kong. Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of 	<p>✓</p> <p>✓</p>

EM&A
Ref.

Recommendation Measures

Implementation Stage

inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD.

- The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. ✓
- In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. ✓

6.1 **Chemical Waste**

- If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the “Code of Practice on the Packaging Labelling and Storage of Chemical Wastes”. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. ✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	<ul style="list-style-type: none"> Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended. 	✓
6.1	<p>General Refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	✓
Land Contamination (Construction)		
7.1	<p>The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials. The following measures are proposed for excavation and transportation of contaminated material:</p> <ul style="list-style-type: none"> To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this</p>

EM&A Ref.	Recommendation Measures	Implementation Stage
	material), provision of washing facilities and prohibition of smoking and eating on site;	project boundary, no mitigation measure is required.
	<ul style="list-style-type: none"> • Stockpiling of contaminated excavated materials on site should be avoided as far as possible; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> • The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> • Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> • Truck bodies and tailgates should be sealed to stop any discharge; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> • Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>

EM&A Ref.	Recommendation Measures	Implementation Stage
	<ul style="list-style-type: none"> Speed control for trucks carrying contaminated materials should be exercised; 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
	<ul style="list-style-type: none"> Maintain records of waste generation and disposal quantities and disposal arrangements. 	<p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p>
Ecological Impact (Construction)		
No mitigation measure is required.		
Landscape and Visual Impact (Construction)		
Table 9.1 (CM1)	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	✓
Table 9.1 (CM2)	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	N/A Compensatory tree planting is being reviewed.

EM&A Ref.	Recommendation Measures	Implementation Stage
Table 9.1 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	N/A Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 (CM4)	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	N/A Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location.
Table 9.1 (CM5)	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	N/A Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 (CM6)	Sensitive streetscape design should be incorporated along all new roads and streets.	N/A Greening along the seafront is proposed, and under review.
Table 9.1 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	N/A Gardens are designed to be built, and under review.
Table 9.1 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	N/A Roof garden is designed to be built, and under review.

EM&A Ref.	Recommendation Measures	Implementation Stage
Table 9.1 (CM9)	Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody	N/A No marine facilities for this project.
Table 9.2 (MCP1)	Use of decorative screen hoarding/boards	✓
Table 9.2 (MCP2)	Early introduction of landscape treatments	N/A No landscape treatments during this stage.
Table 9.2 (MCP3)	Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.	N/A No ventilation shafts for this project.
Table 9.2 (MCP4)	Control of night time lighting	✓
Table 9.2 (MCP5)	Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures.	N/A No temporary open areas for this project.

N/A - Not Applicable

✓ - Implemented

Obs - Observed

Rem - Reminder

K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works (i.e. 3 October 2020 for Zone 2A Foundation, Excavation and Lateral Support Works) to the end of the reporting month and are summarised in the Table K-1 below respectively.

Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for Zone 2A Foundation, Excavation and Lateral Support Works

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of summons	Successful prosecutions
This reporting month	3	0	0
From 03 October 2020 to end of the reporting month	9	0	0

END OF THE REPORT