JOB NO.: TCS01025/19

CONTRACT NO. WD/11/2018 DEVELOPMENT OF LOK MA CHAU LOOP: LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – ENVIRONMENTAL TEAM

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT – FEBRUARY 2020

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
12 March 2020	TCS01025/19/600/R0278v1		
		Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	12 March 2020	First submission to EPD

NATURE & TECHNOLOGIES (HK) LIMITED
科 技 環 保（香 港）有 限 公 司
Lot 12, Tam Kon Shan Road, North Tsing Yi, New Territories, Hong Kong
香港新界北青衣担杆山路 12 號地段 Tel 電話: **(852) 2877 3122** Fax 傳真: **(852) 2511 0922**
Email 電郵 : enquiry@nt.com.hk Website 網址 : http://www.nt.com.hk

Date: 13th March 2020

Project Manager/West
Civil Engineering and Development Department
West Development Office/West Division (5)
25/F, Tsuen Wan Government Offices,
38 Sai Lau Kok Road, Tsuen Wan,
New Territories, Hong Kong
Attn: Mr. LUK Ka Wing

Dear Sirs,

Agreement No. WD/02/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works
- Independent Environmental Checker

Monthly Environmental Monitoring and Audit Report
for February 2020

We refer to the Monthly Environmental Monitoring and Audit Report for February 2020 approved by the Environmental Team Leader. Please note we have no adverse comments on the captioned submission. The captioned submission is hereby verified in accordance with the requirement stipulated in Condition 3.4 of EP No. EP-477/2013.

Should you have any query, please feel free to contact the undersigned at 2877 3122 (jleung@nt.com.hk) or our Mr. Vega Wong at 6113 2368 (vegawong@nt.com.hk).

Yours Sincerely,
For and on behalf of
Nature & Technologies (HK) Limited

Jacky Leung
Independent Environmental Checker

c.c. ET Leader – Ford Business International Limited (Attn: Mr. TW Tam) [by Email: twtam@fordbusiness.com]
Project Manager – SKJV (Attn: Mr. Raymond Yau) [by Email: raymondyaued976@yahoo.com.hk]

EXECUTIVE SUMMARY

INTRODUCTION

ES01 This is the **14th** Monthly Environmental Monitoring and Audit (EM&A) Report presenting the monitoring results and inspection findings for "Contract No. YL/2017/03 – Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works" (hereinafter called the "Contract") for the reporting period from **1st to 29th February 2020** (hereinafter called 'the Reporting Month").

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 Environmental monitoring activities under the EM&A programme for the Contract in the Reporting Month are summarised in the following table.

Environmental Aspect	Monitoring Parameter	Monitoring Station/ Location	Total number of Monitoring Sessions / Date of Monitoring
Air Quality	1-hour Total Suspended Particulates (TSP)	DMS-1, DMS-2A, DMS-3, DMS-4A	15
	24-hour TSP		5
Noise	Leq30mins	NMS-1, NMS-2, NMS-3, NMS-4A	4
Water Quality	Dissolved Oxygen (DO)	CS1, IS1, IS2 CS5, IS6 BS1, IS4	13 (#)
	Turbidity		
	Suspended Solids (SS)		
Ecological	Avifauna flight line survey	Lok Ma Chau Lookout	27th February 2020
	Mammal Monitoring	Along the edge of the proposed Ecological Area	throughout the Reporting Month

 # No water quality monitoring was carried out at IS6 as the channel was dry.

ACTION AND LIMIT LEVELS EXCEEDANCE

ES03 In the Reporting Month, no air quality monitoring exceedance was recorded. For construction noise, all construction noise measurement results were within the performance criteria and no noise complaint (Action Level trigger) was received. For water quality monitoring, a total of **20** Action/ Limit Level exceedances were recorded. Investigation for exceedances had been conducted by Environmental Team (ET) and investigation results revealed that all the exceedances were not related to the works under the Contract. The summary of exceedances is shown in the table below.

Environmental Aspect	Monitoring Parameter	Action Level	Limit Level	Event & Action		
				Investigation Result	Project related exceedance	Corrective Action
Air Quality	1-hour TSP	0	0	--	--	--
	24-hour TSP	0	0	--	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	--	--	--
Water Quality	DO	**1**	0	Non-project related	0	--
	Turbidity	**1**	**9**		0	--
	SS	0	**9**		0	--

ECOLOGICAL MONITORING

ES04 The flight line survey was carried out on ***27th February 2020***. A total of 1,633 birds from 5 species, i.e., Little Egret, Great Egret, Grey Heron, Great Cormorant and Black-faced Spoonbill were recorded during the flight path monitoring in the Reporting Month. The total number of

bird-flights (number of birds of each species passing through each 100m square) observed across all 100m grid squares was 21,348.

ES05 Activities of Eurasian Otter were not recorded from the wildlife cameras. Additional mitigation measure for otter was not required.

CONTAMINATED SOIL REMEDIATION

ES06 In the Reporting Month, no contaminated soil excavation and Cement Solidification / Stabilisation treatment for contaminated soil was conducted by the Contractor.

SITE INSPECTION

ES07 In the Reporting Month, weekly joint site inspections to evaluate the site environmental performance had been carried out by the representatives of the Consultants, Independent Environmental Checker, ET and the Contractor on ***6th, 14th, 20th*** and ***28th February 2020***. No non-compliance was recorded during the site inspections.

ENVIRONMENTAL COMPLAINT

ES08 In the Reporting Month, no environmental complaint was received.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES09 In the Reporting Month, no prosecution or notification of summons was received.

REPORTING CHANGE

ES10 No reporting of change was made in the Reporting Month.

FUTURE KEY ISSUES

ES11 During the dry season, the Contractor should fully implement the air quality mitigation measures as far as practicable to minimise the dust impact to the villages which are located adjacent to the Contract works. Moreover, special attention should be paid on the soil stockpile at the surcharge zone and corresponding dust control measures should be implemented and maintained properly.

ES12 Water quality mitigation measures such as prevention of muddy water or other water pollutants flowing from the site to the old Shenzhen River meander or public area should be fully implemented. In addition, all effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

ES13 Construction noise is one of the key environmental issues during construction of the Contract. Noise mitigation measures such as using quiet plants and noise barriers should be in place, where applicable. In addition, the Contractor was reminded to follow EP condition 2.7 (i) "using powered mechanical equipment for construction works only during the period 9am to 5pm at and near the old Shenzhen River meander and other identified important ecologically sensitive areas."

ES14 The Contractor should maintain the green fence regularly to separate the reed marsh habitat and construction activities. The alignment of green fence may need to be adjusted to suit the construction site boundary during different stages of construction works.

ES15 All other mitigation measures recommended in the ISEMM of the EM&A Manual should be properly implemented and maintained as far as practicable.

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Civil Engineering and Development Department (CEDD) is the Project Proponent and the Permit Holder of Development of Lok Ma Chau Loop (hereinafter called "***the Project***"), which is a Designated Project and an Environmental Permit (EP) No. EP-477/2013 (hereinafter called "***the EP***") was granted on 22nd November 2013 for the Project.

1.1.2 The Lok Ma Chau Loop (the Loop) was once within the administrative boundary of Shenzhen Municipal People's Government and now becomes a part of Hong Kong Special Administrative Region (HKSAR) as a result of the regulation of Shenzhen River. As mentioned in the Policy Address in 2007, the HKSAR Government would cooperate with the Shenzhen authorities to develop the land resources of the Loop to meet the development needs in the future, as well as to consolidate the strategic position of both Hong Kong and Shenzhen.

1.1.3 In order to develop the Loop, Contract No. YL/2017/03 – Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works (hereinafter called the "Contract") was awarded to Sang Hing – Kuly Joint Venture (hereinafter called the "Contractor") in June 2018 for the advance works. The works under the Contract comprise the following:

a) Land decontamination treatment within the Loop;
b) Establishment of an Ecological Area (EA) within the Loop;
c) Construction of a temporary access to the Loop;
d) Minor improvement works to Ha Wan Tsuen East Road and other ancillary works;
e) Construction of temporary noise barriers and miscellaneous road works along Lok Ma Chau Road;
f) Ground treatment works to the first batch of land parcels within the Loop for development of buildings and associated facilities for Phase 1 of the Hong Kong – Shenzhen Innovation and Technology Park and development of the western electricity substation; and
g) Implementation of environmental mitigation measures for the works mentioned in the items (a) to (f) above.

1.1.4 In May 2019, Ford Business International Limited (hereinafter "Ford") was appointed by CEDD as the Environmental Team (ET) to undertake the Environmental Monitoring & Audit (EM&A) programme with associated duties.

1.1.5 This is the **14th** Monthly EM&A presenting the monitoring results and inspection findings for the Contract for the reporting period from **1st** to **29th February 2020** (hereinafter 'the Reporting Month").

1.2 REPORT STRUCTURE

1.2.1 The Monthly EM&A Report is structured into the following sections:-

Section 1 *Introduction*
Section 2 *Project Organisation and Construction Progress*
Section 3 *Summary of Impact Monitoring Requirements under the Contract*
Section 4 *Air Quality Monitoring*
Section 5 *Construction Noise Monitoring*
Section 6 *Water Quality Monitoring*
Section 7 *Ecology Monitoring*
Section 8 *Land Contamination*
Section 9 *Waste Management*
Section 10 *Site Inspections*
Section 11 *Environmental Complaints and Non-Compliances*
Section 12 *Implementation Status of Mitigation Measures*
Section 13 *Conclusions and Recommendations*

2 PROJECT ORGANISATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION OF THE CONTRACT WORKS

2.1.1 Land decontamination and advance engineering works under Contract No. YL/2017/03 is to pave way for the ensuing site formation and infrastructure works within the Loop. The layout plan of construction works of the Contract is shown in **Appendix A** and the scope of the Contract works comprises the following major items:

- Land decontamination treatment within the Loop in accordance with the Contamination Assessment Report/ Remedial Action Plan of the Environmental Impact Assessment (EIA) Report;
- Construction of a temporary access to the Loop (comprising an approximately 60-metre-long temporary vehicular bridge across the old Shenzhen River meander), minor improvement works to Ha Wan Tsuen East Road and other ancillary works;
- Establishment of an EA of about 12.8 ha within the Loop;
- Construction of temporary noise barriers and miscellaneous road works along Lok Ma Chau Road;
- Ground treatment works to the first batch of land parcels within the Loop for development of building and associated facilities for Phase 1 of the Hong Kong – Shenzhen Innovation and Technology Park, and for development of the western electricity substation; and
- Implementation of environmental mitigation measures and other ancillary works.

2.2 PROJECT ORGANISATION

2.2.1 The project organisation is shown in ***Appendix B***. The responsibilities of respective parties are:

Civil Engineering and Development Department (CEDD)

2.2.2 CEDD is the Project Proponent and the Permit Holder of the EP of the Project and assumes overall responsibility for the Project. An Independent Environmental Checker (IEC) shall be employed by CEDD to audit the results of the EM&A work carried out by the ET.

Environmental Protection Department (EPD)

2.2.3 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

The Consultants

2.2.4 ***Black & Veatch Hong Kong Ltd.*** (B&V) is the Consultants responsible for overseeing the construction works and for ensuring that the works undertaken by the Contractor are in accordance with the specification and contractual requirements. The duties and responsibilities of the Consultants with respect to the EM&A may include:

- Supervise the Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Assist the Project Proponent in employing an IEC to audit the results of the EM&A works carried out by the ET;
- Participate in joint site inspection undertaken by the ET and/or IEC;
- Oversee the implementation of the agreed Event and Action Plan in the event of any project-related exceedance; and
- Adhere to the procedures for carrying out complaint investigations.

The Contractor

2.2.5 ***Sang Hing – Kuly Joint Venture*** is Contractor of the Contract. The duties and responsibilities of the Contractor is:

- Report to the Consultants;
- Implement the EIA recommendations and requirements;
- Provide assistance to ET in carrying out monitoring and auditing;
- Submit proposals on mitigation measures in case of project-related exceedances of Action and

Limit levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact where project-related exceedance of Action and Limit levels occurs; and
- Adhere to the agreed procedures for carrying out compliant investigation.

Environmental Team (ET)

2.2.6 ***Ford Business International Limited*** (Ford) was appointed by CEDD as the ET to undertake the EM&A programme with the associated duties in May 2019. The ET is managed by the ET Leader who has at least 7 years' experience in EM&A and has relevant professional qualifications. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in time under the Contract, to enable fulfillment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The duties of ET shall include:

- Set up all the required environmental monitoring stations;
- Monitor various environmental parameters as required in the EM&A Manual;
- Analyse the environmental monitoring and audit data and review the success of EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carry out site inspections to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to preempt problems;
- Liaison with IEC on all environmental performance matters, and submit all relevant EM&A proforma in a timely manner for IEC's verification;
- Prepare reports on the environmental monitoring data and site environmental conditions;
- Report on the environmental monitoring and audit results to the IEC, the Contractor, the Consultants, Project Proponent and EPD;
- Recommend suitable mitigation measures to the Contractor in the case of project-related exceedance of Action and Limit levels in accordance with the Event and Action Plans;
- Give advice to the Contractor on environmental improvement, awareness, enhancement matters, etc. on site;
- Undertake regular on-site audits / inspections and report to the Contractor, the Consultants and IEC of any potential non-compliance;
- Follow up and close out non-compliance actions; and
- Adhere to the procedures for carrying out environmental complaint investigation.

Independent Environmental Checker (IEC)

2.2.7 ***Nature & Technologies (HK) Limited*** was employed by the Permit Holder (i.e. CEDD) prior to the commencement of construction of the Project and Mr. Jacky Leung is the IEC. The IEC has at least 7 years' experience in EM&A and has relevant professional qualifications. The duties of IEC shall include:

- Review in an independent, objective and professional manner the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and location of sensitive receivers;
- Report the audit results to the Consultants, the Project Proponent and EPD in parallel;
- Review the EM&A reports submitted by the ET;
- Check and review the proposed mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check and review the effectiveness of the mitigation measures that have been recommended in the EIA and the EM&A Manual, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to the Consultants, Project Proponent and EPD.

- Coordinate the monitoring and auditing works for all the on-going contracts in the area in order to identify possible sources / causes of exceedances and recommend suitable remedial actions where appropriate;
- Coordinate the assessment and response to complaints / enquires from locals, green groups, district councils or the public at large;
- On as-needed basis, verify and certify the environmental acceptability of the Contractor's construction methodology (both temporary and permanent works), relevant design plans and submissions under the EP; and
- Verify investigation results of environmental complaint cases and the effectiveness of corrective measures.

2.3 CONSTRUCTION PROGRESS

2.3.1 The major construction activities conducted under the Contract in the Reporting Month are summarised below. A 3-month rolling construction programme is shown in ***Appendix C***.

a) Maintenance works for 3m-high green fence;
b) Sheetpiling works at contamination hot spot LD-004 and excavation of top soil at contamination hot spot LD-005
c) Surcharge filling works and associated drainage works;
d) Construction of stone blanket and stone columns;
e) Establishment and maintenance of nursery areas for reed bed;
f) Trail pits for erection of noise barrier at Lok Ma Chau Road;
g) Formation of Temporary Animal Passage (TAP); and
h) Reinstatement of disused northern temporary site drainage facility.

2.4 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.4.1 According to the EP conditions, the documents required to be submitted to EPD are listed below:

- Commencement date of construction of the Project
- Layout Plans of the Project
- Management organisation of the main construction companies and/or any form of joint ventures associated with the construction of the Project
- Detailed works schedule of the Project
- Emergency Contingency Plan
- Ecological Mitigation / Habitat Creation and Management Plan (HCMP)
- Baseline Monitoring Report for the Project
- Dedicated web site to notify EPD

2.4.2 Summary of the relevant permits, licences, and/or notifications on environmental protection for the Project are presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licences and Permits of the Contract

Item	Description	Licence/Permit Status		
		Ref. no.	Effective Date	Expiry Date
1	Air Pollution Control (Construction Dust) Regulation	Application Ref No.: 435754	15/08/2018	Till the Contract ends
2	Waste Disposal Regulation – Billing Account for Disposal of Construction Waste	Account No.: 7031266	16/08/2018	Till the Contract ends
3	Chemical Waste Producer Registration	Waste Producers No: WPN 5213-542-S4120-01	08/08/2018	Till the Contract ends
4	Water Pollution Control Ordinance – Discharge Licence	Discharge Licence No.: WT00032414-2018	28/08/2019	31/08/2024

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS UNDER THE CONTRACT

3.1 GENERAL

3.1.1 The EM&A requirements are set out in the EM&A Manual. Environmental issues such as air quality, construction noise, water quality and ecology are identified as the key aspect during the construction phase of the Project.

3.1.2 A summary of construction phase EM&A requirements under the Contract are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A programme of construction phase monitoring for the Contract shall cover the following environmental issues:

- Air quality;
- Construction noise;
- Water quality; and
- Ecology.

3.2.2 A summary of the monitoring parameters is presented in ***Table 3-1.***

Table 3-1 Summary of EM&A Requirements

Environmental Aspect	Parameter
Air Quality	• One-hour Total Suspended Particulates (TSP) and 24-hour TSP
Noise	• $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference. (Note: L_{10} is the level exceeded for 10% of the time and L_{90} is the level exceeded for 90% of the time)
Water Quality	**In-situ Measurements** • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (℃). **Laboratory Analysis** • Suspended Solids (mg/L)
Ecology	**Avifauna** • Flight line survey **Mammals** • Eurasian Otter

3.3 MONITORING LOCATIONS

Air quality

3.3.1 In accordance with the EM&A Manual, a total of four (4) designated air quality monitoring locations namely, DMS-1 (ASR HWTR-1), DMS-2 (ASR LMCR-5), DMS-3 (ASR BR-4) and DMS-4 (ASR MTL-20) were recommended.

3.3.2 Since the monitoring at designated location DMS-2 was denied by the landlord during the baseline monitoring, alternative location DMS-2A was proposed. In addition, since no works under the Contract will be conducted near ASR MTL-20, Hong Kong Police Force Operation Base of Lok Ma Chau (named as DMS-4A) was proposed to replace DMS-4 to conduct air quality monitoring since baseline monitoring. Both alternative locations had been verified by IEC and endorsed by EPD. Location of the air quality monitoring stations under the Contract are listed in ***Table 3-2*** and shown

in ***Appendix D***.

Table 3-2 Impact Monitoring Stations – Air Quality

Station Identity (ID)	Location
DMS-1	Village House along Ha Wan Tsuen East Road
DMS-2A	Village House along Lok Ma Chau Road
DMS-3	Village House along Old Border Road
DMS-4A	Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill

Construction Noise

3.3.3 In accordance with the EM&A Manual, a total of four (4) noise sensitive receivers including HWT-8 (Village house in Ha Wan Tsuen (hereinafter named "NMS-1')), HWTR-11 (Village house along existing Ha Wan Tsuen Road (hereinafter named "NMS-2")), BR-4 (Village house along Old Border Road (hereinafter named "NMS-3")) and MTL-20 (Village house in Ma Tso Lung close to the proposed Eastern Connection Road), were recommended to perform construction noise monitoring.

3.3.4 Since there will be no works under the Contract YL/2017/03 conducted near noise sensitive receiver (NSR) MTL-20, Hong Kong Police Force Operation Base of Lok Ma Chau (hereinafter named "NMS-4A") was proposed to replace MTL-20 to conduct noise monitoring since baseline monitoring. The alternative location had been verified by IEC and endorsed by EPD. Location of the noise monitoring stations under the Contract YL/2017/03 are listed in ***Table 3-3*** and shown in ***Appendix D***.

Table 3-3 Impact Monitoring Stations – Construction Noise

Station ID	Description	Measurement
NMS-1	Village house in Ha Wan Tsuen	Façade Measurement
NMS-2	Village house along existing Ha Wan Tsuen East Road	Free Field measurement
NMS-3	Village house along Old Border Road	Free Field measurement
NMS-4A	Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill	Free Field measurement

Water Quality

3.3.5 In accordance with the EM&A Manual, there were eleven (11) designated water quality monitoring stations recommenced for the Project. However, in view of the geographical area of Contract YL/2017/03, there were six (6) water quality monitoring stations related to the Contract. In addition, an additional monitoring station BS1 was proposed at temporary steel bridge in order to monitor the potential water quality impact due to construction work nearby and the proposed additional station as agreed by CEDD, IEC and EPD before baseline monitoring. Location of the water monitoring stations under the Contract are listed in ***Table 3-4*** and shown in ***Appendix D***.

Table 3-4 Impact Monitoring Stations – Water Quality

Station ID	Description	Nature of the location
CS1	Control Station at Old Shenzhen River Meander	Control Station at Meander
IS1	Impact Station at Old Shenzhen River Meander	Impact Station at Meander
IS2	Impact Station at Old Shenzhen River Meander	Impact Station at Meander
IS4	Impact Station at Ping Hang Stream	Reference Station
CS5	Control Station at channel at south of Lung Hau Road	Control Station for IS6
IS6	Impact Station near Lung Hau Road	Impact Station
BS1#	Impact Station at Old Shenzhen River Meander	Impact Station for the temporary steel bridge

 # Additional Monitoring Station to the EM&A Manual.

Ecology

3.3.6 According to the EM&A Manual, the ecological monitoring for the Loop covers the flight line survey and mammal activities. The flight line survey was undertaken at the Lok Ma Chau (LMC) Lookout to the south of the Loop. Mammal activities were monitored by three wildlife cameras setup in potential movement corridor of mammal along the edge of the proposed EA including Locations A, B and C. The locations of ecological monitoring are illustrated in ***Appendix D***.

3.4 MONITORING FREQUENCIES AND PERIODS

3.4.1 The requirements of impact monitoring are set out in the EM&A Manual and presented in the sub-sections below.

Air Quality Monitoring

3.4.2 The frequency of air quality monitoring of 1-hour TSP shall be 3 times every six days throughout the construction period; and for 24-hour TSP shall be once every 6 days throughout the construction period.

Noise Monitoring

3.4.3 During normal construction working hours (0700-1900 Monday to Saturday), monitoring of $L_{eq(30min)}$ (as 6 consecutive $L_{eq(5min)}$) shall be carried out at the agreed monitoring locations once every week. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

3.4.4 The frequency of water quality monitoring shall be 3 days per week during the course of works. The interval between two sets of monitoring shall not be less than 36 hours.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. ET proposed to use a direct reading dust meter to measure 1-hour TSP levels and sufficient information had been submitted to the IEC to prove that the instrument was capable of achieving comparable results to the High Volume Air Sampler (HVS).

3.5.2 The filter paper for 24-hour TSP measurement shall be determined by a HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring are listed in ***Table 3-5***.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
24-Hour TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
1-Hour TSP	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

3.5.4 According to the EM&A Manual, wind data monitoring equipment shall be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location had been proposed by the ET and agreed with IEC.

3.5.5 According to EM&A requirement, a wind data monitoring equipment (brand name "WindSonic") was set up at air quality monitoring station DMS-4A and it had been verified by IEC before

installation.

Noise Monitoring

3.5.6 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used to carry out the noise monitoring. Sound level meter shall be checked by an acoustic calibrator. Wind speed shall be checked with a portable wind speed meter which is capable of measuring the wind speeds in m/s.

3.5.7 All equipment used for noise monitoring are listed in ***Table 3-6***.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Brüel & Kjær 2238
Calibrator	Brüel & Kjær 4231 / Rion NL-74
Portable Wind Speed Indicator	Testo Anemometer

3.5.8 Sound level meter listed above complied with the *International Electrotechnical Commission Publications 651: 1979 (Type 1)* and *804: 1985 (Type 1)* specifications, as recommended in Technical Memorandum I issued under the Noise Control Ordinance. The acoustic calibrator and sound level meter used in the impact monitoring were calibrated yearly.

Water Quality Monitoring

Dissolved Oxygen (DO) and Temperature Measuring Equipment

3.5.9 DO measuring instruments should be portable and weatherproof. The equipment should come complete with cable and sensor, and DC power source. The equipment should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:

- a DO level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

Salinity Equipment

3.5.10 A portable salinometer capable of measuring salinity in the range of 0 – 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.

pH Measuring Equipment

3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions according to the APHA Standard Methods.

Turbidity Measuring Equipment

3.5.12 The turbidity measuring instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.

Water Depth Detector

3.5.13 A portable, battery-operated echo sounder or measuring tape should be used for determination of water depth at each designated monitoring station, whenever appropriate.

Sample Container and Storage

3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, shall be used for water sampling if water depth over 0.5m. For sampling from very shallow water depths e.g. ≤0.5 m, water sample shall be directly collected at 100mm below water surface using a sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will depend on the sampling location and water depth.

3.5.15 Water samples for Suspended Solids (SS) determinations should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and transport to the testing laboratory. The samples shall be delivered to the laboratory within 24 hours of collection and be analysed as soon as possible after collection.

3.5.16 SS analysis should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory SS determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.

3.5.17 Water quality monitoring equipment used in the impact monitoring are listed in ***Table 3-7***. SS analysis was carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd* (HOKLA registration no.66).

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or measuring tape
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or Teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Pro 20 / YSI 550A
pH meter	AZ8685 pH pen-style meter
Salinometer	AZ8371 Salinometer
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with ice pad

Ecology

3.5.18 Flight line survey shall be undertaken with a pair of high power binocular (10x magnification with 40mm lens), whereas the mammal activities shall be monitored by 3 motion-activated wildlife cameras.

3.6 MONITORING METHODOLOGY

Air Quality Monitoring

1-hour TSP

3.6.1 The 1-hour TSP monitor used for 1-hour TSP measurement was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which was a portable, battery-operated laser photometer. The 1-hour TSP meter provided a real time 1-hour TSP measurement based on 90^{o} light scattering. The 1-hour TSP monitor consisted of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP was measured;

(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

(c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.2 The 1-hour TSP meter was used within the valid period following manufacturer's Operation and Service Manual.

24-hour TSP

3.6.3 The equipment used for 24-hour TSP measurement was a brand named "Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system", which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The HVS consisted of the following:

(a.) An anodized aluminum shelter;

(b.) A 8"x10" stainless steel filter holder;

(c.) A blower motor assembly;
(d.) A continuous flow/pressure recorder;
(e.) A motor speed-voltage control/elapsed time indicator;
(f.) A 7-day mechanical timer, and
(g.) A power supply of 220v/50 Hz

3.6.4 The HVS was operated and calibrated on a regular basis in accordance with the manufacturer's instruction using Tisch Calibration Kit Model TE-5025A. Calibration was carried out at two month intervals.

3.6.5 24-hour TSP was collected on filters of HVS and quantified by ALS Technichem (HK) Pty Ltd, upon receipt of the samples. The ET would keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% relative humidity (RH) and 25°C, for six months prior to disposal.

Noise Monitoring

3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). As supplementary information for data auditing, statistical results such as A-weighted levels L_{10} and L_{90} shall also be obtained for reference.

3.6.7 All noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30min)}$ in six consecutive $L_{eq(5min)}$ measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; $Leq_{(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

3.6.8 Prior to noise measurement, the accuracy of sound level meter was checked by an acoustic calibrator which was capable of generating known sound pressure levels at known frequencies. The checking was performed before and after the noise measurement.

Water Quality Monitoring

3.6.9 The sampling procedures of the in-situ monitoring are presented below:

Sampling Procedure

3.6.10 At each water quality monitoring station, a portable battery-operated echo sounder or measuring tape was used for determination of water depth.

3.6.11 Impact water quality monitoring should be conducted at three depths (i.e. 1m below surface, mid-depth and 1m above river bed, except where the water depth was less than 6m, mid-depth station may be omitted. Should the water depth be less than 3m, only the mid-depth station was monitored) in accordance with the requirements set out in the EM&A Manual.

3.6.12 Prior to collection of water sample, the sample container was rinsed with a portion of water sample. The water sample collected was then transferred to a high-density polythene bottle which was provided by the laboratory, 10ategor with a unique sample number and sealed with a screw cap.

3.6.13 General information such as date and time of sampling, weather condition as well as the personnel responsible for the monitoring were recorded on the field data sheet maintained by ET.

3.6.14 A 'Willow' 33-liter plastic cool box packed with ice was used to preserve the water samples prior to arriving at the laboratory for SS determination. The water temperature of the cool box was maintained at a temperature as close to 4^0C as possible without being frozen. Samples collected were delivered to the laboratory upon collection.

In-situ Measurement

DO Measurement

3.6.15 The DO measuring instruments were portable and weatherproof. The equipment contained a membrane electrode with automatic temperature compensation. The equipment had a sensor and direct current (DC) power source and was capable of measuring:

- A DO level in the range of 0 – 20 mg/L and 0 – 200% saturation; and
- A temperature of 0 – 45 degree Celsius.

Turbidity Measurement

3.6.16 The turbidity measuring instruments were portable and weatherproof with DC power source, and had a photoelectric sensor capable of measuring turbidity level between 0–1000 NTU.

Salinity Measurement

3.6.17 A portable salinometer capable of measuring salinity in the range of 0–40 parts per thousand (ppt) was used.

pH Measurement

3.6.18 A portable pH meter capable of measuring a range between 0.0 and 14.0 was used to measure pH under the specified conditions according to the APHA Standard Methods.

3.6.19 All in-situ measurement equipment were calibrated by HOKLAS accredited laboratory at three month intervals.

Laboratory Analysis

3.6.20 SS determination of all water samples were carried out by ALS Technichem (HK) Pty Ltd using *APHA Standard Methods 2540D* as specified in the *EM&A Manual.* The SS determination was started within 24 hours of collection of water samples.

Ecology Survey/Monitoring

3.6.21 Flight line survey was undertaken at the LMC Lookout to the south of the Loop as specified in the EM&A Manual, with particular focus on the numbers and species composition of birds using the flight line corridor over the old Shenzhen River meander (the Meander), and evaluation of whether the construction activities had caused any significant impact to the flight line. Species generally commensal with man (e.g. Black-collared Starling), common and widespread in HK (e.g. Crested Myna) or small in size and not prone to following flight lines en masse (e.g. Barn Swallow) were ignored in order to concentrate on species of conservation interest and/or those prone to using flight lines, but flights involving short hops from point to point were not recorded.

3.6.22 The estimated location of the flight paths used by waterbird species, birds of prey or other larger species of conservation interest passing through the area were marked on a standard map; and the number, the species and their height above the ground were also recorded.

3.6.23 Given the difficulty of accurately measuring height above ground from a distance, this parameter was estimated in relation to the level of the Loop and adjacent fish pond area, and/or the location of the observer, and assigned into one of the three height classes as follows: 10m height class – height ranges from 5-15m, 20m height class – height ranges from 15-25m, and 30m height class – height above 25m.

3.6.24 All flight lines marked on the maps were then overlain by a $100m^2$ grid, and the quantity of birds passing through each $100m^2$ (i.e., the number of "bird-flights") was categorised by geometrical interval classification and the map illustrated with the distribution of flight paths of the Reporting Month was then compared with those presented in the EIA Report so as to review whether any significant impact on the flight lines was recorded.

3.6.25 Monitoring of Eurasians Otter is notoriously difficult due to their secretive and nocturnal habits in Hong Kong; as such three motion-activated wildlife cameras have been deployed at the wildlife corridors along the longitudinal gradient of the EA. Given the dynamism of the site conditions and

the on-going construction activities within the EA, the location of the cameras would be reviewed on a monthly basis.

3.7 EQUIPMENT CALIBRATION

3.7.1 Calibration of the HVS was performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer's instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the calibration kit was calibrated annually. The calibration data were properly documented and the records are maintained by ET for future reference.

3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. The 1-hour TSP meter was calibrated annually with the HVS in same condition.

3.7.3 Wind data monitoring equipment was calibrated by the supplier prior to purchase.

3.7.4 The sound level meter and calibrator were calibrated and certified by a HOKLAS accredited laboratory or any other international accreditation scheme annually.

3.7.5 All water quality monitoring equipment were calibrated by HOKLAS accredited laboratory at three month intervals.

3.7.6 Except the wind data monitoring equipment, calibration certificates of all monitoring equipment as used for impact monitoring in the Reporting Month, and the certificate of HOKLAS accredited laboratory are shown in ***Appendix E***.

3.8 DERIVATION OF ACTION/LIMIT LEVELS

3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the EM&A Manual, the criteria of air quality, construction noise and water quality were established, namely Action and Limit levels and they are listed in ***Tables 3-8, 3-9*** and ***3-10***.

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
DMS-1	353	184	500	260
DMS-2A	370	166		
DMS-3	351	166		
DMS-4A	350	152		

Table 3-9 Action and Limit Levels for Construction Noise Monitoring

Monitoring Station	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NMS-1, NMS-2, NMS-3 and NMS-4A	When one or more documented complaints are received	75 dB(A)[Note 1 & Note 2]

Note 1: Reduced to 70 dB(A) for school and 65 dB(A) during school examination period.
Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

Table 3-10 Action and Limit Levels for Water Quality Monitoring

Parameter	Performance Criteria at Depth Average	Monitoring Station				
		IS1	IS2	IS4	IS6	BS1
DO (mg/L)	Action Level	7.0	5.3	4.1	5.9	3.9
	Limit Level	6.8	5.2	3.8	5.8	3.7
Turbidity (NTU)	Action Level	27.7	35.5	70.9	120% of CS5	29.9
	Limit Level	29.9	38.1	74.6	130% of CS5	32.6

Parameter	Performance Criteria at Depth Average	Monitoring Station				
		IS1	IS2	IS4	IS6	BS1
SS (mg/L)	Action Level	28.0	39.8	155.0	120% of CS5	36.5
	Limit Level	28.8	41.2	175.0	130% of CS5	36.9

Remarks:

(1) Depth-averaged was calculated by taking the arithmetic mean of readings of all three depths.

(2) For DO, non-compliance of water quality limit would occur when monitoring result at impact station was lower than the limit.

(3) For SS & turbidity, non-compliance of water quality limit would occur when monitoring result at impact station was higher than the limit.

3.8.2 Should project-related non-compliance of the environmental quality criteria occur, remedial actions will be triggered according to the Event and Action Plan which is presented in ***Appendix F.***

3.9 DATA MANAGEMENT AND DATA QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

3.9.1 All monitoring data were handled by the ET's in-house data recording and management system. The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were then input into a computerised database maintained by the ET. The laboratory results were input directly into the computerised database and checked by personnel other than those who input the data.

3.9.2 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 The air quality monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarised in the following sub-sections.

4.2 AIR QUALITY MONITORING RESULTS

4.2.1 In the Reporting Month, a total of ***15*** events of 1-hour TSP and ***5*** sessions of 24-hours TSP monitoring were carried out at each monitoring station and the monitoring results are summarised in ***Tables 4-1 to 4-4***. The detailed 24-hour TSP monitoring data are presented in ***Appendix H*** and the relevant graphical plots are shown in ***Appendix I***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – DMS-1

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
4-Feb-20	22	5-Feb-20	9:10	75	66	71
10-Feb-20	66	11-Feb-20	9:08	67	71	63
15-Feb-20	40	17-Feb-20	9:01	77	81	73
21-Feb-20	47	22-Feb-20	9:30	79	84	73
27-Feb-20	57	28-Feb-20	9:20	81	72	84
Average (Range)	**46 (22 – 66)**	Average (Range)		**74 (63 – 84)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results –DMS-2A

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
4-Feb-20	21	5-Feb-20	9:25	60	66	72
10-Feb-20	76	11-Feb-20	9:21	73	67	78
15-Feb-20	38	17-Feb-20	9:22	76	69	84
21-Feb-20	20	22-Feb-20	9:41	79	75	68
27-Feb-20	35	28-Feb-20	9:33	79	69	74
Average (Range)	**38 (20 – 76)**	Average (Range)		**73 (60 – 84)**		

Table 4-3 Summary of 24-hour and 1-hour TSP Monitoring Results – DMS-3

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
4-Feb-20	21	5-Feb-20	12:28	55	61	67
10-Feb-20	26	11-Feb-20	12:38	61	51	57
15-Feb-20	56	17-Feb-20	12:45	56	49	51
21-Feb-20	56	22-Feb-20	13:27	57	65	51
27-Feb-20	28	28-Feb-20	12:40	53	62	59
Average (Range)	**37 (21 – 56)**	Average (Range)		**57 (49 – 67)**		

Table 4-4 Summary of 24-hour and 1-hour TSP Monitoring Results –DMS-4A

Date	24-hour TSP (μg/m^3)	1-hour TSP (μg/m^3)				
		Date	Start Time	1st reading	2nd reading	3rd reading
4-Feb-20	33	5-Feb-20	13:01	88	77	94
10-Feb-20	28	11-Feb-20	14:03	66	56	63
15-Feb-20	29	17-Feb-20	12:18	54	61	66
21-Feb-20	38	22-Feb-20	13:34	68	81	74
27-Feb-20	26	28-Feb-20	13:18	57	63	69
Average (Range)	**31 (26 – 38)**	Average (Range)		**69 (54 – 94)**		

4.2.2 As shown in ***Tables 4-1 to 4-4***, all the 1-hour and 24-hour TSP monitoring results were below the Action/Limit Levels in this Reporting Month and therefore no corrective action was required.

4.2.3 The weather data including wind speed and wind direction in the Reporting Month are summarised in ***Appendix J***.

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 The noise monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarised in the following sub-sections.

5.2 NOISE MONITORING RESULTS

5.2.1 In the Reporting Month, ***4*** sessions of noise monitoring were carried out at each designated monitoring station. Sound level meter was set at 1m from the exterior of the building façade for noise monitoring station NMS-1. For noise monitoring conducted in free-field condition at NMS-2, NMS-3 and NMS-4A, façade correction (+3dB(A)) had been added in the measurement results according to acoustical principles and EPD guidelines.

5.2.2 The noise monitoring results are summarised in ***Table 5-1.*** The detailed noise monitoring data are presented in ***Appendix H*** and the relevant graphical plots are shown in ***Appendix I***.

Table 5-1 Summary of Construction Noise Monitoring Results

Date	Construction Noise Level ($L_{eq30min}$), dB(A)			
	NMS-1	NMS-2(*)	NMS-3(*)	NMS-4A(*)
5-Feb-20	61	66	64	59
11-Feb-20	58	69	61	57
17-Feb-20	63	66	65	60
28-Feb-20	59	64	61	63
Limit Level	**75 dB(A)**			

Remarks

(*) *façade correction (+3 dB(A) was added according to acoustical principles and EPD guidelines*

5.2.3 As shown in ***Table 5-1***, no construction noise monitoring results triggered the Limit Level (75 dB(A)) in the Reporting Month. Moreover, no noise complaint was received in the Reporting Month.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Month, water quality monitoring was performed at the designated monitoring stations CS1, IS1, IS2, IS4, CS5 and the additional station BS1. The water quality monitoring schedule is presented in ***Appendix G***. The monitoring results are summarised in the following sub-sections.

6.2 WATER QUALITY MONITORING RESULTS

6.2.1 In the Reporting Month, a total of **thirteen (13)** sampling days were scheduled for water quality monitoring. Since the monitoring channel of IS6 was dried out throughout the Reporting Month, no water quality monitoring was conducted at IS6. The key monitoring parameters including DO, turbidity and SS are summarised in ***Tables 6-1 to 6-3***. Summary of non-project related exceedances are shown in ***Table 6-4***. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in ***Appendix H*** and the relevant graphical plots are shown in ***Appendix I***.

Table 6-1 Water Quality Monitoring of DO Results, (mg/L)

Date	CS1	CS5	IS1	IS2	IS4	IS6	BS1
	Control Station	Control Station	Impact Station	Impact Station	Reference Station	Impact Station	Impact Station
1-Feb-20	8.3	9.6	13.9	7.0	6.0	#	11.4
4-Feb-20	7.3	9.4	8.6	9.1	4.8	#	9.2
6-Feb-20	6.4	8.4	8.1	7.7	5.3	#	7.0
8-Feb-20	6.4	9.0	7.7	6.9	5.9	#	7.5
11-Feb-20	8.7	9.2	7.1	6.2	5.9	#	7.0
13-Feb-20	7.8	9.3	8.9	7.4	7.7	#	9.6
15-Feb-20	7.2	9.3	7.3	7.3	5.0	#	8.1
18-Feb-20	7.8	13.2	10.1	7.9	6.7	#	8.1
20-Feb-20	9.8	9.3	13.0	7.0	6.2	#	9.5
22-Feb-20	11.5	8.6	14.9	6.5	6.2	#	13.3
25-Feb-20	9.0	7.4	13.1	9.9	6.1	#	13.6
27-Feb-20	7.4	11.6	11.3	7.2	***3.9***	#	9.6
29-Feb-20	7.7	9.0	11.2	6.4	4.2	#	9.6

Remark: # Water quality monitoring was unable to be carried out as the channel was dry.
Value in italic and bold indicated Action Level non-project related exceedance.

Table 6-2 Water Quality Monitoring of Turbidity Results, (NTU)

Date	CS1	CS5	IS1	IS2	IS4	IS6	BS1
	Control Station	Control Station	Impact Station	Impact Station	Reference Station	Impact Station	Impact Station
1-Feb-20	6.8	7.4	17.1	14.6	**934.0**	#	**40.8**
4-Feb-20	8.3	11.4	17.9	20.6	**659.5**	#	23.9
6-Feb-20	9.6	7.4	18.9	16.8	**528.0**	#	25.6
8-Feb-20	9.5	4.1	22.8	16.1	**444.0**	#	20.0
11-Feb-20	22.9	12.3	22.0	16.4	**250.0**	#	9.8
13-Feb-20	4.8	7.2	6.9	11.9	**466.0**	#	7.4
15-Feb-20	7.5	7.0	8.5	31.5	27.8	#	15.3
18-Feb-20	6.6	25.1	9.9	30.2	36.8	#	18.4
20-Feb-20	6.4	13.6	8.8	14.1	23.3	#	17.7
22-Feb-20	8.0	26.5	9.1	23.2	18.2	#	12.9
25-Feb-20	8.0	10.5	10.2	17.1	24.1	#	12.5
27-Feb-20	9.8	12.2	17.7	20.2	**810.0**	#	***30.9***
29-Feb-20	9.5	18.2	12.3	16.4	**515.5**	#	19.8

Remark: # Water quality monitoring was unable to be carried out as the channel was dry.
Value in italic and bold indicated Action Level non-project related exceedance
Value underlined and in bold indicated Limit Level non-project related exceedance.

Table 6-3 Water Quality Monitoring of SS Results (mg/L)

Date	CS1 Control Station	CS5 Control Station	IS1 Impact Station	IS2 Impact Station	IS4 Reference Station	IS6 Impact Station	BS1 Impact Station
1-Feb-20	8.5	7.0	21.0	29.5	**11180.0**	#	29.5
4-Feb-20	5.5	21.0	19.0	17.5	**1915.0**	#	19.5
6-Feb-20	6.5	6.0	13.5	13.5	**1915.0**	#	19.5
8-Feb-20	10.0	9.0	10.5	16.0	**713.5**	#	10.5
11-Feb-20	4.0	36.5	9.5	30.0	**623.0**	#	6.0
13-Feb-20	6.5	8.0	12.5	29.5	**3375.0**	#	8.5
15-Feb-20	7.5	12.5	10.5	32.5	42.0	#	17.5
18-Feb-20	9.5	44.0	11.5	28.5	96.5	#	21.5
20-Feb-20	10.5	34.0	12.5	20.0	44.5	#	24.5
22-Feb-20	13.5	47.5	14.0	25.5	91.5	#	16.0
25-Feb-20	16.0	55.5	18.0	26.0	70.5	#	19.0
27-Feb-20	20.0	23.5	23.5	25.5	**2330.0**	#	**44.5**
29-Feb-20	14.0	30.0	18.5	20.5	**2105.0**	#	23.0

Remark: # Water quality monitoring was unable to be carried out as the channel was dry.
Value underlined and in bold indicated Limit Level non-project related exceedance.

6.2.2 In this Reporting Month, there were ***twenty (20)*** Action/ Limit Level non-project related exceedances, namely 1, 10 and 9 non-project related exceedances of dissolved oxygen, turbidity and SS recorded respectively and they are summarised in ***Table 6-4***.

Table 6-4 Summary of Action and Limit Levels Exceedances Recorded in the Reporting Month

Station	DO		Turbidity		SS		Non-project related Exceedance		Project Related Exceedance	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
IS1	0	0	0	0	0	0	0	0	0	0
IS2	0	0	0	0	0	0	0	0	0	0
IS4	**1**	0	0	**8**	0	**8**	**1**	**16**	0	0
IS6	0	0	0	0	0	0	0	0	0	0
BS1	0	0	**1**	**1**	0	**1**	**1**	**2**	0	0
Number of Exceedance	**1**	0	**1**	**9**	0	**9**	**2**	**18**	0	0

6.2.3 Investigations had been conducted by ET and investigation results revealed that all the exceedances were non-project related. The investigation findings are summarised below:

- Water quality mitigation measures were implemented by the Contractor properly;
- No water-based construction activities were conducted;
- No discharge from land-based construction activity was observed;
- The values of turbidity and SS exceedances recorded at BS1 was within the range of baseline; and
- Stagnant and very shallow water was observed at IS4. The water depth at IS4 was less than 0.1m and the water sample was likely to be disturbed by the stir up sediment during the water sampling

7 ECOLOGY MONITORING

7.1 REQUIREMENTS

7.1.1 As required under Section 11.4.1.1 of the EM&A Manual, survey of flight line corridor of Avifauna is required from the beginning of works until 12 months after the establishment of the EA or completion of works of the Western Connection Road, whichever is the later. The purpose of the survey is to identify the number and species composition of birds using the flight line and monitor if there is any impact from construction works.

7.1.2 Furthermore, as required under Section 11.4.1.2 of the EM&A Manual, monitoring of mammals is required for Eurasian Otter, other mammals and dogs during the site formation and establishment period of EA. The purpose of the monitoring is to observe the connectivity between the existing reed marsh and the EA, and if there is any sign of otter and mammals around the EA.

7.2 MONITORING RESULTS

Avifauna

7.2.1 The flight line survey was carried out on 27th February 2020. The survey started at 6:17AM (sunrise time at 6:47 AM) and lasted for 2 hours. The weather was cool, cloudy and windy during the monitoring. According to Hong Kong Observatory the lowest tide level of the day is 0.8m at 5:31am.

7.2.2 A total of 1,633 birds from 5 species, i.e., Little Egret, Great Egret, Grey Heron, Great Cormorant and Black-faced Spoonbill were recorded during the flight path monitoring in the Reporting Month. ***Table 7-1*** summaries the number of birds observed during the monitoring and the height of the flight path of each of species respectively.

Table 7-1 Number of Birds Recorded in Reporting Month

Species	Number of Birds	Height Class 1	Height Class 2	Height Class 3
Black-faced Spoonbill 黑臉琵鷺	65	1	38	26
Great Cormorant 鸕鷀	1,068	28	696	344
Great Egret 大白鷺	275	70	142	63
Grey Heron 蒼鷺	10	4	5	1
Little Egret 小白鷺	215	90	120	5

7.2.3 The total number of bird-flights (number of birds of each species passing through each 100m square) observed across all 100m grid squares was 21,348. ***Table 7-2*** shows the number of bird-flights for the 5 species respectively.

Table 7-2 Number of Bird-Flights in Reporting Month

Species	Total Number of Bird-Flights
Black-faced Spoonbill 黑臉琵鷺	757
Great Cormorant 鸕鷀	14,101
Great Egret 大白鷺	3,510
Grey Heron 蒼鷺	130
Little Egret 小白鷺	2,850

7.2.4 The distribution of bird flights is shown in the ***Appendix K,*** given that most of the flight lines across the LMC recorded in the Reporting Month were over the Meander and its immediate vicinity, as such significant impact to the core part of the flight line, i.e. area comprising the southeast edge of LMC (up to a width of ~ 150m) as well as up to a width of ~50m fish ponds area at the southeast bank of the Meander, was not observed in the Reporting Month.

Mammals

7.2.5 The latest locations of the camera set deployed within the EA zone are shown in ***Appendix D.*** Only picture of stray dog was captured by the camera at Location B during the Reporting Month. A

photo of the animal photographed by the wildlife camera is shown in ***Appendix L***.

8 LAND CONTAMINATION

8.1 GENERAL

8.1.1 According to the EM&A Manual Section 8.2 and the details of the remediation and associated testing referred to in Chapter 8 of the EIA Report (AEIAR-176/2013), five (5) arsenic-contaminated zones were identified within the Loop. The estimated depth and volume of contaminated soil for each remediation zone are listed in ***Table 8-1*** below.

Table 8-1 Detailed Contamination Information for Designated Remediation Areas

Contamination Zone ID in EIA	Contamination Hot Spot	Estimated Vertical Extent of Contamination	Estimated Thickness (m)	Estimated Area of Contamination Zone (m^2)	Estimated Volume of Contaminated Soil (m^3)
A-S24	LD-001	2.5m to 4.0m below existing ground level	1.5	4001	6002
A-SG10	LD-002	4.0m to 5.5m below existing ground level	1.5	3520	5280
A-S20	LD-003	2.5m to 4.0m below existing ground level	1.5	4989	7484
A-S03	LD-004-A	2.5m to 4.0m below existing ground level	1.5	4580	6870
A-S03a1	LD-004-B	4.0m to 5.5m below existing ground level	1.5	4452	6678
A-S03c1	LD-004-C	1.0m to 2.5m below existing ground level	1.5	5601	8402
A-S01	LD-005	2.5m to 5.5m below existing ground level	3.0	5576	16728

8.1.2 Based on the Contract requirements, "Solidification / Stabilisation" was the recommended treatment method to remediate all contaminated soils and Portland cement was proposed to be used for the contaminated soil treatment. The target of soil remediation is listed in ***Table 8-2***.

Table 8-2 Contaminant Solidification & Stabilisation Target for Cement Solidification / Stabilisation (CS/S)

Contaminant	Toxicity Characteristic Leaching Procedure (TCLP) Limit of Arsenic	Unconfined Compressive Strength (UCS)
Metal – Arsenic	≤5 mg/L	≥1 Mpa

8.1.3 Trial of CS/S was undertaken between April and June 2019 and the second trial was conducted in August 2019. According to trial performance results, cement / soil ratios of 10% and 7.5% could achieve the remediation target and these ratios had been adopted for the subsequent remediation work. The proposed cement/soil ratios were accepted by relevant parties before the remediation work started. The contaminated soil excavation and remediation commenced on site in mid-July 2019.

8.2 REMEDIATION WORK PROGRESS IN THE REPORTING MONTH

8.2.1 According to the information provided by the Contractor, the progress of contaminated soil excavation and remediation in the Reporting Month are summarised in ***Table 8-3*** below.

Table 8-3 Progress of Contaminated Soil Excavation and Remediation in the Reporting Period

Contamination Hot Spot	Volume of Contaminated Soil Excavation		Volume of Contaminated Soil / Cement Mix (i.e. Treated Soil)		Treatment Performance Sample Collected (set)
	(Tonne)	(m^3)	(Tonne)	(m^3)	
LD-001	-	-	-	-	-
LD-002	0	0	0	0	0

Contamination Hot Spot	Volume of Contaminated Soil Excavation		Volume of Contaminated Soil / Cement Mix (i.e. Treated Soil)		Treatment Performance Sample Collected (set)
	(Tonne)	(m^3)	(Tonne)	(m^3)	
LD-003	-	-	-	-	-
LD-004-A	0	0	0	0	0
LD-004-B	0	0	0	0	0
LD-004-C	0	0	0	0	0
LD-005	0	0	0	0	0

Remarks: Contamination soil treatment of contamination hot spot LD-001 and hot spot LD-003 was completed in September 2019 and December 2019 respectively.

8.2.2 In the Reporting Month, no contaminated soil excavation and CS/S treatment was conducted.

8.2.3 The Interim Remediation Report for hot spots LD-001 and LD-003 prepared by the Land Contamination Specialist was respectively submitted to EPD on ***2nd December 2019*** and ***14th February 2020*** in accordance with Condition 2.16 of the EP-477/2013. Moreover, the Interim Remediation Report of hot spot LD-001 was approved by EPD on ***6th January 2020.***

8.3 SOLIDIFICATION AND STABILISATION PERFORMANCE RESULTS IN THE REPORTING MONTH

8.3.1 Based on the requirements of the approved Remediation Action Plan (RAP), a set of CS/S performance testing sample shall be collected for each $100m^3$ of the mixed products and delivered to the HOKLAS accredited laboratory for preforming of TCLP / UCS analysis to determine the leachability of arsenic and the strength of the mixed products. In the Reporting Month, no CS/S treatment for contaminated soil was undertaken and no performance testing sample was collected and sent to HOKLAS accredited laboratory for TCLP / UCS analysis.

9 WASTE MANAGEMENT

9.1 GENERAL WASTE MANAGEMENT

9.1.1 Waste management was carried out in accordance with the Waste Management Plan (WMP) for the Contract.

9.2 RECORDS OF WASTE QUANTITIES

9.2.1 All types of waste arising from the construction works are broadly classified into the following:

- Insert construction and demolition (C&D) material; and
- C&D waste.

9.2.2 The quantities of waste for disposal in this Reporting Month under the Contract are summarised in ***Tables 9-1*** and ***9-2*** and the Waste Flow Table as shown in ***Appendix M***. Whenever possible, materials were reused on-site as far as practicable.

Table 9-1 Summary of Quantities of Inert C&D Materials for the Contract

Type	Quantity in Reporting Month	Disposal / Dumping Ground
Reused in this Contract (Inert) (in '000 m^3)	0	NA
Reused in other Contracts/ Projects (Inert) (in '000 m^3)	0	NA
Disposal as Public Fill (Inert) (in '000 m^3)	0	NA

Table 9-2 Summary of Quantities of C&D Wastes for the Contract

Type	Quantity in Reporting Month	Disposal / Dumping Ground
Recycled Metal ('000kg)	0	NA
Recycled Paper / Cardboard Packing ('000kg)	(*)	NA
Recycled Plastic ('000kg)	(*)	NA
Chemical Wastes ('000kg)	0	NA
General Refuses ('000m^3)	0.05	NENT Landfill

Remark: (*) negligible amount

10 SITE INSPECTIONS

10.1 REQUIREMENTS

10.1.1 According to the EM&A Manual, the programme of environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections were carried out to confirm the environmental performance.

10.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

10.2.1 In the Reporting Month, joint site inspections to evaluate the site environmental performance were carried out by the representatives of the Consultants, IEC, ET and the Contractor on ***6th, 14th, 20th*** and ***28th February 2020***. No non-compliance was recorded.

10.2.2 The findings / deficiencies observed during the weekly site inspections are listed in ***Table 10-1***.

Table 10-1 Site Observations for the Contract

Date	Findings / Deficiencies	Follow-Up Status
6th February 2020	• Generator and Excavator without Non-road Mobile Machinery (NRMM) label were observed near hot spot LD-004 and Decontamination Plant 1 respectively. NRMM Label properly shall be displayed on the construction plants properly when in use on site. • Stagnant water was observed in the drip tray of a generator near hot spot LD-004, the Contractor should remove the stagnant water to avoid mosquito breeding on site. • Chemical containers without drip tray were observed near Decontamination Plant 2. The Contractor should provide drip tray for all chemical containers to prevent land contamination.	• Generator without NRMM label near hot spot LD-004 was removed from site. Also, NRMM Label was displayed on the excavator near Decontamination Plant. • Stagnant water in the drip tray was removed. • Chemical containers were placed with drip tray underneath.
14th February 2020	• Chemical containers without drip tray were observed near the new wheel washing facilities. The Contractor should provide drip tray for all chemical containers to prevent land contamination. • Damaged sand bag bund was observed near the site entrance, the Contractor should maintain and repair the sand bag bund properly.	• Chemical containers were placed with drip tray underneath. • Damaged sand bag bund was repaired.
20th February 2020	• Chemical containers without drip tray were observed near worker rest area. The Contractor should provide drip tray for all chemical containers to prevent land contamination.	• Chemical containers were placed with drip tray underneath and covered with tarpaulin sheet properly.
28th February 2020	• NRMM label with improper color should be replaced for the generator at Reed Bed Nursery. • Proper spacing from ground should be maintained for Type A green fence at TAP.	• NRMM label with proper labelling standard was displayed. • Proper spacing from ground was maintained for the Type A green fence at TAP.

10.2.3 To minimise adverse environmental impact, several advices / reminders were provided to the Contractor during the site inspections and summarised below:

- To provide sufficient speed limit sign near Decontamination Plant 2;
- To check and review the temporary drainage system on site regularly;
- To maintain good housekeeping;
- To provide NRMM labels for all plants equipment in use; and
- To ensure the engine door of air compressor was closed during operation.

10.2.4 General housekeeping such as site tidiness and cleanliness should be maintained for all works areas. Furthermore, the Contractor was reminded to implement the Waste Management Plan of the Contract.

10.2.5 Water quality mitigation measures as recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) shall be implemented as far as practicable. Special attention should be paid on prevention of muddy water or wastewater flowing from the site to the Meander or public areas.

11 ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCES

11.1 ENVIRONMENTAL COMPLAINTS, SUMMONS AND PROSECUTIONS

11.1.1 There was no environmental complaint, prosecution or notification of summons received in the Reporting Month.

11.1.2 The statistical summary table of the environmental complaints, summons and prosecution are presented in ***Tables 11-1, 11-2*** and ***11-3***. Detailed complaint log for the Contract is presented in ***Appendix N.***

Table 11-1 Statistical Summary of Environmental Complaints

Reporting Month	Environmental Complaint Statistics		
	Frequency	Cumulative	Project related complaint
Jan 2019 – Jan 2020	4	4	0
Feb 2020	0		0

Table 11-2 Statistical Summary of Environmental Summons

Reporting Month	Environmental Summons Statistics		
	Frequency	Cumulative	Project related summons
Jan 2019 – Jan 2020	0	0	0
Feb 2020	0		0

Table 11-3 Statistical Summary of Environmental Prosecution

Reporting Month	Environmental Prosecution Statistics		
	Frequency	Cumulative	Project related prosecution
Jan 2019 – Jan 2020	0	0	0
Feb 2020	0		0

11.2 OTHER ENVIRONMENTAL NON-COMPLIANCES

11.2.1 In addition, no emergency event related to violation of environmental legislation for illegal dumping and landfilling was received in the Reporting Month.

12 IMPLEMENTATION STATUS OF MITIGATION MEASURES

12.1 GENERAL REQUIREMENTS

12.1.1 The environmental mitigation measures recommended in the ISEMM in the EM&A Manual covered the issues of dust, noise, water, waste and ecology and they are summarised and presented in ***Appendix O.***

12.1.2 The Contract works under the Project shall be implementing the required environmental mitigation measures according to the EM&A Manual as subject to the site conditions. Environmental mitigation measures generally implemented by the Contract and the implementation status are shown in ***Appendix O***.

12.1.3 In the Reporting Month, the layout of the green fences erected on site generally followed the layout in the approved HCMP, and was considered satisfactory. Erection of green fence around proposed TAP outside the northern tip of the EA zone was in progress.

12.1.4 Reinstatement of the disused northern temporary site drainage facility commenced in February 2020 and was in progress. To avoid disturbance to the existing vegetation/reed marsh during the reinstatement, steel rods with flags and 1.2m-high fence were erected between the area of reinstatement and existing vegetation/reed marsh. Erection works were completed in mid-February 2020 and considered satisfactory.

12.1.5 Moreover, the Contractor plans to realign a short section of green fence on site outside the southern temporary site drainage facility (retention pond). The resulting revised green fence alignment of the section concerned will fall on the existing additional green fence already in place on site to the north of the southern temporary site drainage facility. The proposed revised green fence alignment would provide proper separation between the reed marsh habitat in the central part of the Loop and the new works area, it is considered that the proposed green fence realignment complies with the EP condition.

12.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

12.2.1 According to the information provided by the Contractor, the major construction activities under the Contract in the coming month are listed below:

a) Maintenance works for 3m-high green fence;
b) Erection of temporary noise barriers at Lok Ma Chau Road;
c) Sheetpiling works at contamination hot spot LD-004 and excavation of top soil and contaminated soil at contamination hot spots LD-002 and LD-005;
d) Land decontamination works;
e) Surcharge filling works and associated drainage works;
f) Construction of stone columns;
g) Establishment and maintenance of nursery areas for reed bed;
h) Construction of embankment at EA zone;
i) Formation of TAP; and
j) Reinstatement of disused northern temporary site drainage facility.

12.3 KEY ISSUES FOR THE COMING MONTH

12.3.1 During the dry season, the Contractor should fully implement the air quality mitigation measures as far as practicable to minimise the dust impact to the villages which are located adjacent to the Contract works. Moreover, special attention should be paid on the soil stockpile at the surcharge zone and corresponding dust control measures should be implemented and maintained properly.

12.3.2 Water quality mitigation measures such as prevention of muddy water or other water pollutants flowing from the site to the Meander or public area should be fully implemented. All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

12.3.3 Construction noise is one of the key environmental issues during construction of the Contract. Noise mitigation measures such as using quiet plants and noise barriers should be in place, where

applicable. In addition, the Contractor was reminded to follow EP condition 2.7 (i) "using powered mechanical equipment for construction works only during the period 9am to 5pm at and near the old Shenzhen River meander and other identified important ecologically sensitive areas".

12.3.4 The Contractor should maintain the green fence regularly to separate the reed marsh habitat and construction activities. The alignment of green fence may need to be adjusted to suit the construction site boundary during different stages of construction works.

12.3.5 All other mitigation measures recommended in the ISEMM of the EM&A Manual should be properly implemented and maintained as far as practicable.

13 CONCLUSIONS AND RECOMMENDATIONS

13.1 CONCLUSIONS

13.1.1 This is the **14th** Monthly EM&A Report presenting the monitoring results and inspection findings for the Reporting Period from **1st to 29th February 2020**.

13.1.2 No 24-hour or 1-hour TSP of air quality monitoring result that triggered the Action or Limit Levels was recorded. No corrective action was required.

13.1.3 In this Reporting Month, all construction noise measurement results were within the performance criteria and no noise complaint (Action Level trigger) was received.

13.1.4 For water quality monitoring, a total of 20 Action/ Limit Level exceedances were recorded in the Reporting Month. Investigations for the exceedances had been conducted by ET which revealed that all the exceedances were non-project related.

13.1.5 The flight line survey was carried out on 27th February 2020. A total of 1,633 birds from 5 species, i.e., Little Egret, Great Egret, Grey Heron, Great Cormorant and Black-faced Spoonbill were recorded during the flight path monitoring in the Reporting Month. The total number of bird-flights (number of birds of each species passing through each 100m square) observed across all 100m grid squares was 21,348. Given that most of the flight lines across the Loop recorded in the Reporting Month were over the Meander and its immediate vicinity, significant impact to the flight line was not observed.

13.1.6 Activities of Eurasian Otter were not recorded from the wildlife cameras. Therefore, additional mitigation measure for otter was not required.

13.1.7 In the Reporting Month, no contaminated soil excavation and CS/S treatment was conducted by the Contractor.

13.1.8 In the Reporting Month, no environmental complaint, prosecution or notification of summons was received. In addition, no emergency event related to violation of environmental legislation for illegal dumping and landfilling was received.

13.1.9 In the Reporting Month, weekly joint site inspections to evaluate the site environmental performance had been carried out by the representatives of the Consultants, IEC, ET and the Contractor on ***6th, 14th, 20th*** and ***28th February 2020***. No non-compliance was recorded during the site inspections.

13.2 RECOMMENDATIONS

13.2.1 During the dry season, the Contractor should fully implement the air quality mitigation measures as far as practicable to minimise the dust impact to the villages which are located adjacent to the Contract works. Moreover, special attention should be paid on the soil stockpile at the surcharge zone and corresponding dust control measures should be implemented and maintained properly.

13.2.2 Water quality mitigation measures such as prevention of muddy water or other water pollutants flowing from the site to the Meander or public area should be fully implemented. In addition, all effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

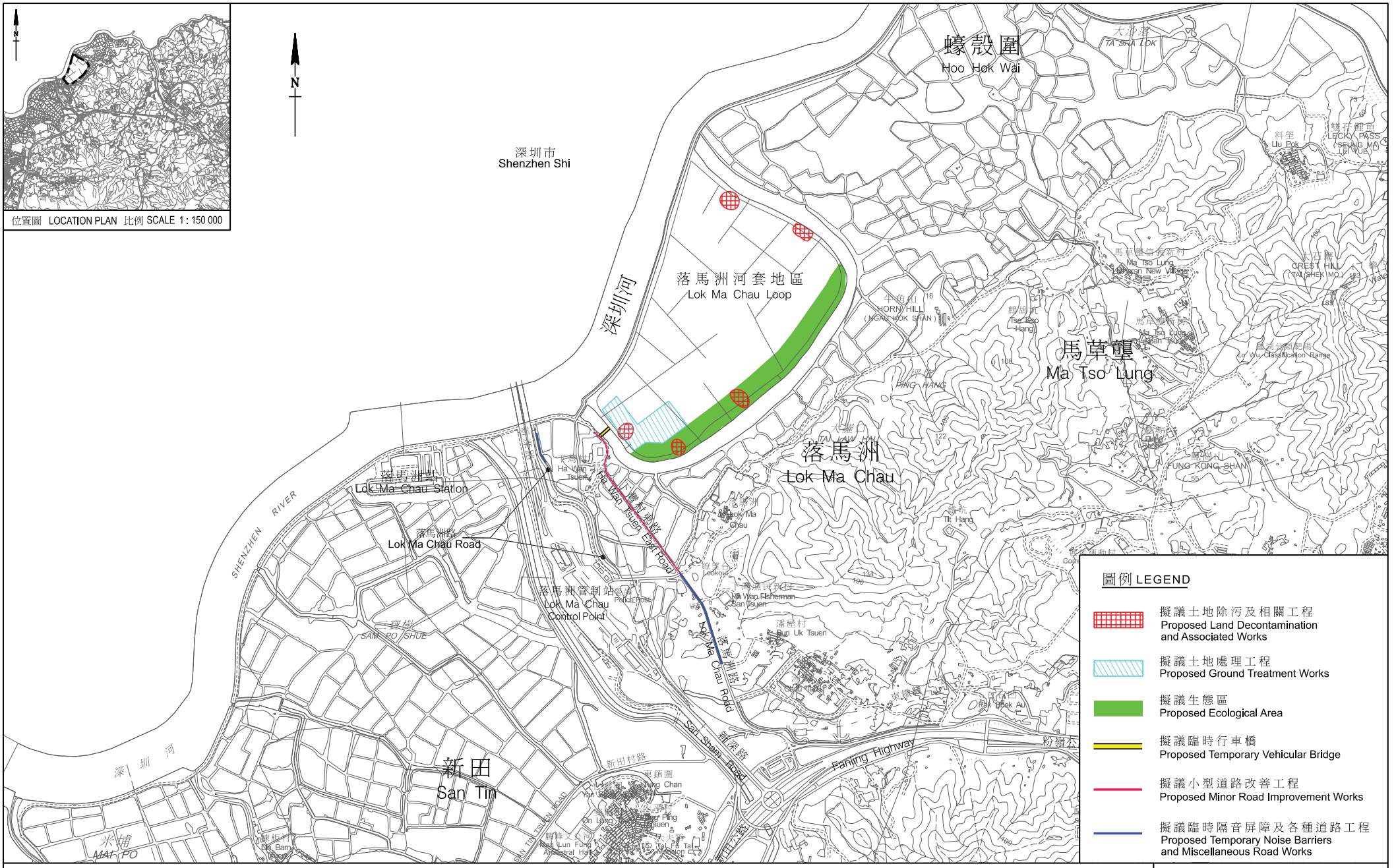
13.2.3 Construction noise is one of the key environmental issues during construction of the Contract. Noise mitigation measures such as using quiet plants and noise barriers should be in place, where applicable. In addition, the Contractor was reminded to follow EP condition 2.7 (i) “using powered mechanical equipment for construction works only during the period 9am to 5pm at and near the old Shenzhen River meander and other identified important ecologically sensitive areas”.

13.2.4 The Contractor should maintain the green fence regularly to separate the reed marsh habitat and construction activities. The alignment of green fence may need to be adjusted to suit the construction site boundary during different stages of construction works.

13.2.5 All other mitigation measures recommended in the ISEMM of the EM&A Manual should be properly implemented and maintained as far as practicable.

Appendix A

Layout Plan of Construction Works of the Contract



工務計劃項目第748CL號—落馬洲河套地區發展：土地除污及前期工程

PWP ITEM No. 748CL-DEVELOPMENT OF LOK MA CHAU LOOP : LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS

平面圖
LAYOUT PLAN

R:\Sketch-WDO\W1\W1-008\W1-008.dgn

1/2/2018

A3 420MM X 297MM

Appendix B

Project Organisation

Contact Details of Key Personnel for Contract YL/2017/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
CEDD	Project Proponent	Mr. K.W. Luk	2417 6397	2412 0358
B&V	Consultants	Mr. Victor Go	2601 3988	2452 5170
SKJV	Contractor	Mr. Alan Sung – Project Director	9051 4060	2452 5170
SKJV	Contractor	Mr. Raymond Yau – Project Manager	9858 1820	2452 5170
SKJV	Contractor	Mr. Alex Po – Deputy Project Manager	9369 0403	2452 5170
SKJV	Contractor	Mr. Eric Fong – Site Agent	9472 2694	2452 5170
SKJV	Contractor	Mr. Nam Kam Pui / Lori Leung Environmental Officer	6448 8963 / 6882 3382	2452 5170
SKJV	Contractor	Mr. Hung Hin Yuen – Environmental Supervisor	9250 5290	2452 5170
Nature & Technologies	Independent Environmental Checker	Mr. Jacky Leung – Independent Environmental Checker	2877 3122	2511 0922
Ford	Environmental Team	TW Tam – Environmental Team Leader	2959 6059	2959 6079
Ford	Environmental Team	Ben Tam – Deputy Environmental Team Leader	2959 6059	2959 6079
Ford	Environmental Team	Nicola Hon – Environmental Consultant	2959 6059	2959 6079

Legend:

CEDD – (Project Proponent) – Civil Engineering and Development Department

B&V – (Consultants) –Black & Veatch Hong Kong Limited

Nature & Technologies (IEC) –Nature & Technologies (HK) Limited

Ford (ET) – Ford Business International Limited

SKJV (the Contractor of the Contract YL/2017/03) – Sang Hing – Kuly Joint Venture

Appendix C

3-month Rolling Construction Programme

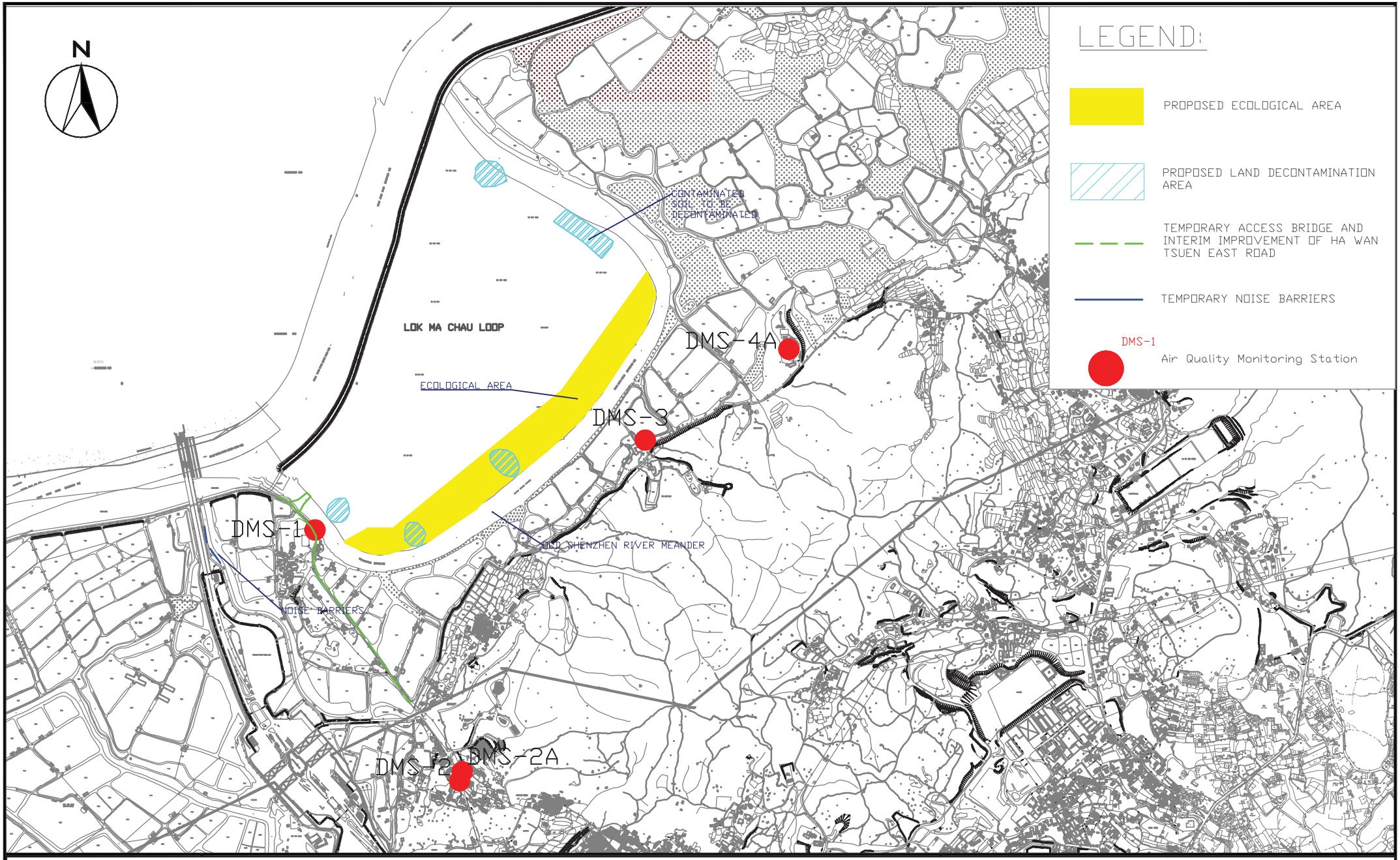
Sang Hing - Kuly Joint Venture
Contract No. YL/2017/03
Development of Lok Ma Chau Loop：Land Decontamination and Advance Engineering Works

3-Month Rolling Programme for the Works

ITEM	WORKS DESCRIPTION	YEAR 2020					
		FEBRUARY		MARCH		APRIL	
1	TEMPORARY VEHICULAR BRIDGE AND APPROACH RAMP						
2	LAND DECONTAMINATION WORKS						
3	GROUND TREATMENT WORKS						
4	CREATION OF ECOLOGICAL AREA						
5	TEMPORARY NOISE BARRIER AT LOK MA CHAU ROAD						

Appendix D

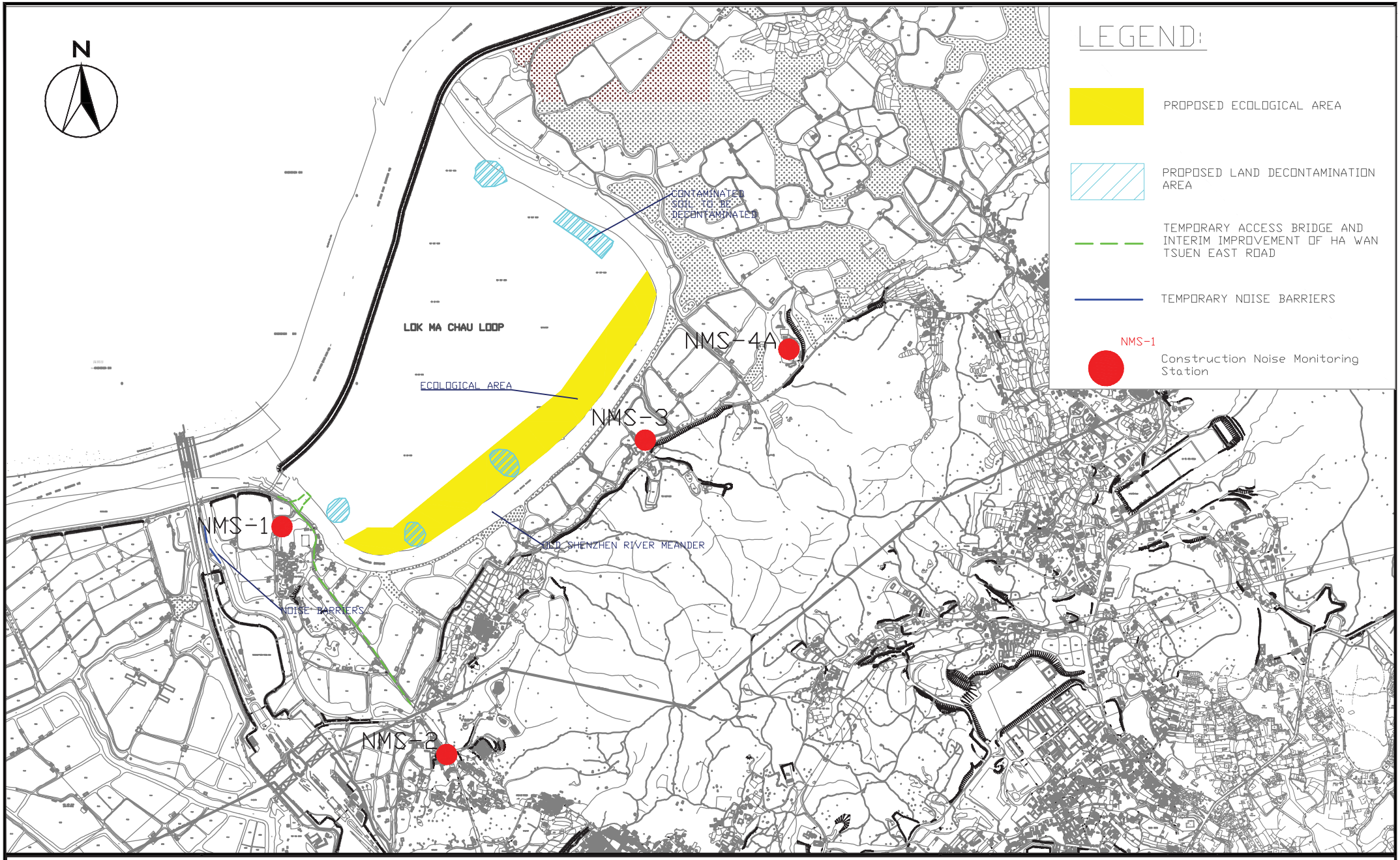
Monitoring Locations



CONTRACT NO. WD/11/2018

DEVELOPMENT OF LOK MA CHAU LOOP: LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – ENVIRONMENTAL TEAM

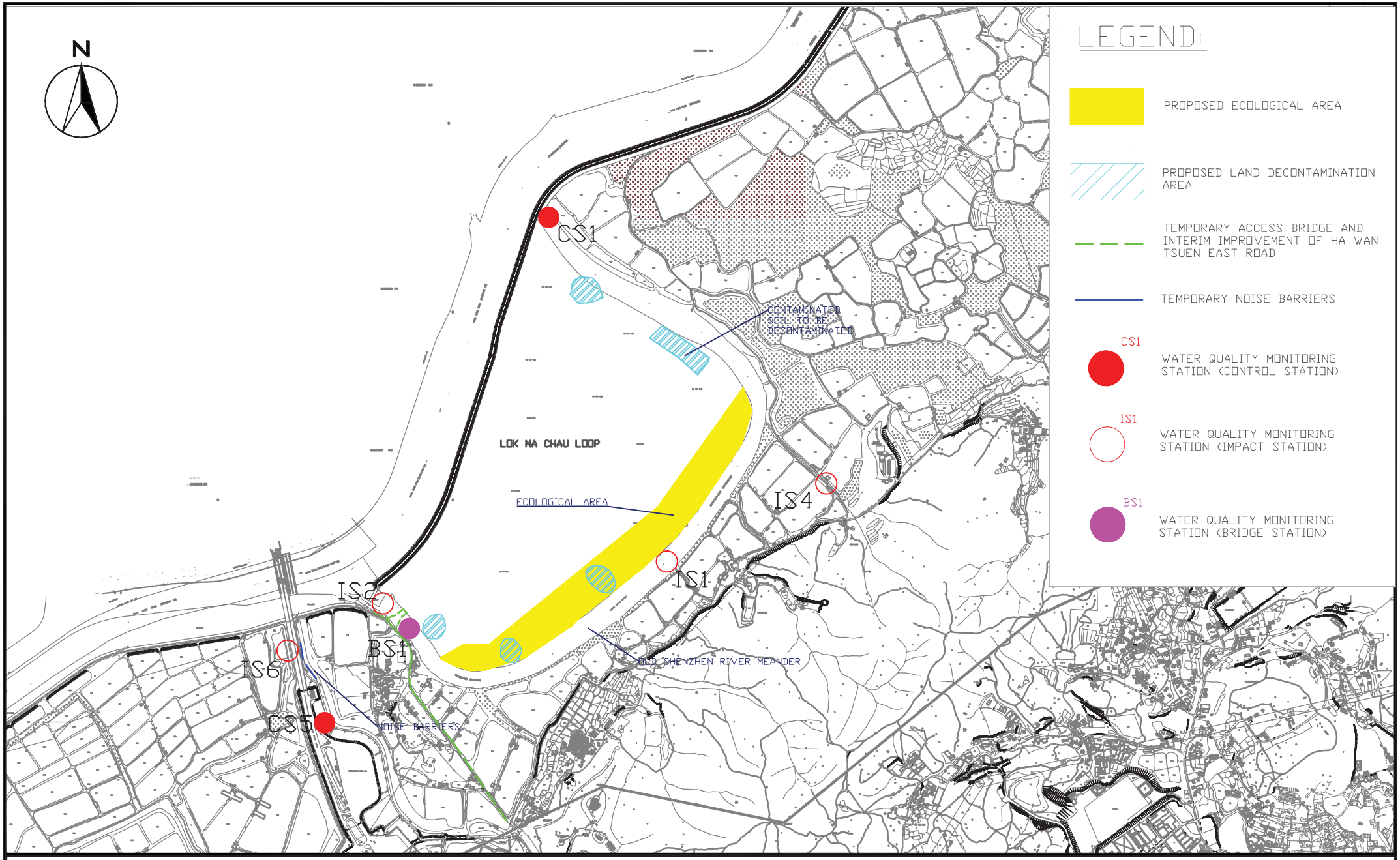
LOCATION OF AIR QUALITY MONITORING STATIONS



CONTRACT NO. WD/11/2018

DEVELOPMENT OF LOK MA CHAU LOOP: LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – ENVIRONMENTAL TEAM

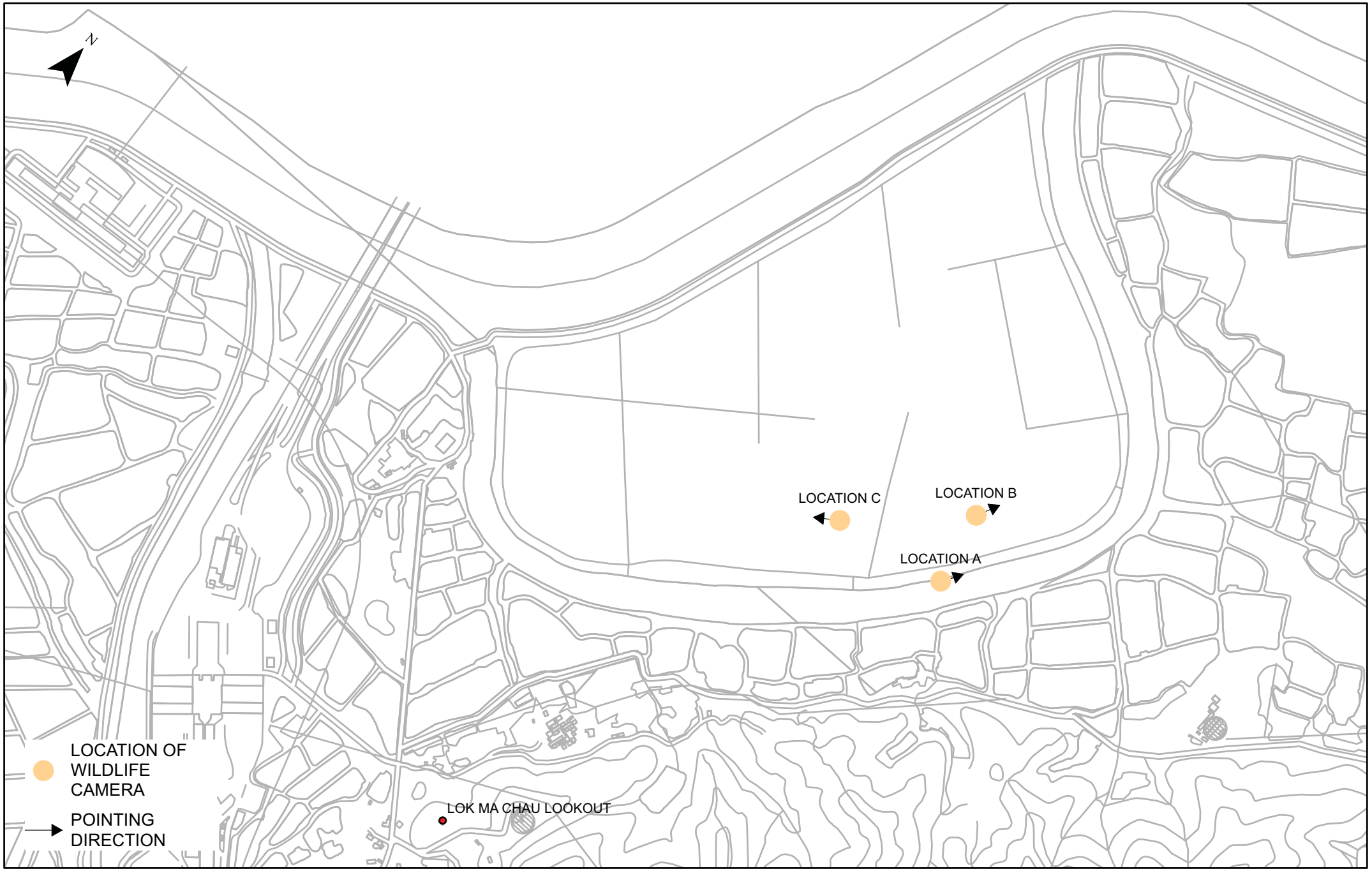
LOCATION OF NOISE MONITORING STATIONS



CONTRACT NO. WD/11/2018

DEVELOPMENT OF LOK MA CHAU LOOP: LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – ENVIRONMENTAL TEAM

LOCATION OF WATER QUALITY MONITORING STATIONS



CONTRACT NO. WD/11/2018

DEVELOPMENT OF LOK MA CHAU LOOP: LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – ENVIRONMENTAL TEAM

LOCATION OF ECOLOGICAL MONITORING

Appendix E

Calibration Certificates

CALIBRATION CERTIFICATES FOR MONITORING EQUIPMENT USED IN THE REPORTING MONTH

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for DMS-1 (Serial No of mass controller: 1105)	30 Dec 2019	29 Feb 2020
2		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for DMS-2A (Serial No of mass controller: 1259)	30 Dec 2019	29 Feb 2020
3		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for DMS-3 (Serial No of mass controller: 1260)	30 Dec 2019	29 Feb 2020
4		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for DMS-4A (Serial No of mass controller:1895)	30 Dec 2019	29 Feb 2020
5		Calibration Kit TISCH Model TE-5025A Orifice ID 1941 and Rootsmeter S/N: 438320	5 Feb 2019	5 Feb 2020
5a		Calibration Kit TISCH Model TE-5025A Orifice ID 1612 and Rootsmeter S/N: 438320	7 Feb 2020	7 Feb 2021
6		Laser Dust Monitor, Model LD-3B (Serial No. 366418) – EQ108	18 Mar 2019	18 Mar 2020
7		Laser Dust Monitor, Model LD-3B (Serial No. 456658) – EQ115	18 Mar 2019	18 Mar 2020
8		Laser Dust Monitor, Model LD-3B (Serial No. 3Y6501) – EQ111	18 Mar 2019	18 Mar 2020
9		Laser Dust Monitor, Model LD-3B (Serial No. 3Y6502) – EQ113	15 Mar 2019	15 Mar 2020
10	Noise	Brüel & Kjær Sound Level Meter (Serial No. 2285722) – EQ009	19 Jun 2019	19 Jun 2020
11		Brüel & Kjær Sound Level Meter (Serial No. 3012330) – EQ017	7 Jun 2019	7 Jun 2020
12		Brüel & Kjær Acoustical Calibrator (Serial No. 2713428) – EQ082	7 Jun 2019	7 Jun 2020
13		Rion NL-74 Acoustical Calibrator (Serial No. 34657230) – EQ086	16 Jul 2019	16 Jul 2020
14	Water	YSI 550A (Serial No. 05F2063AZ)	16 Jan 2020	16 Apr 2020
15		HACH 2100Q Turbidimeter (Serial No. 11030C008499)	16 Jan 2020	16 Apr 2020
16		AZ 8685 pH Meter (Serial No. 1246609)	13 Dec 2019	13 Mar 2020
17		AZ8371 Salinity Meter (Serial No. 1219392)	13 Dec 2019	13 Mar 2020

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House along Ha Wan Tsuen Road Date of Calibration: 30-Dec-19
Location ID : DMS1 Next Calibration Date: 29-Feb-20
Name and Model: TISCH HVS Model TE-5170 Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020	Corrected Pressure (mm Hg)	765
Temperature (°C)	20.3	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.0968
Model->	5025A	Qstd Intercept ->	-0.00065
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.20	5.20	10.4	1.556	57	58.10	Slope = 47.2322
13	4.80	4.80	9.6	1.495	51	51.99	Intercept = -16.7738
10	3.65	3.65	7.3	1.303	44	44.85	Corr. coeff. = 0.9945
7	2.90	2.90	5.8	1.162	38	38.74	
5	2.00	2.00	4.0	0.965	28	28.54	

Calculations :

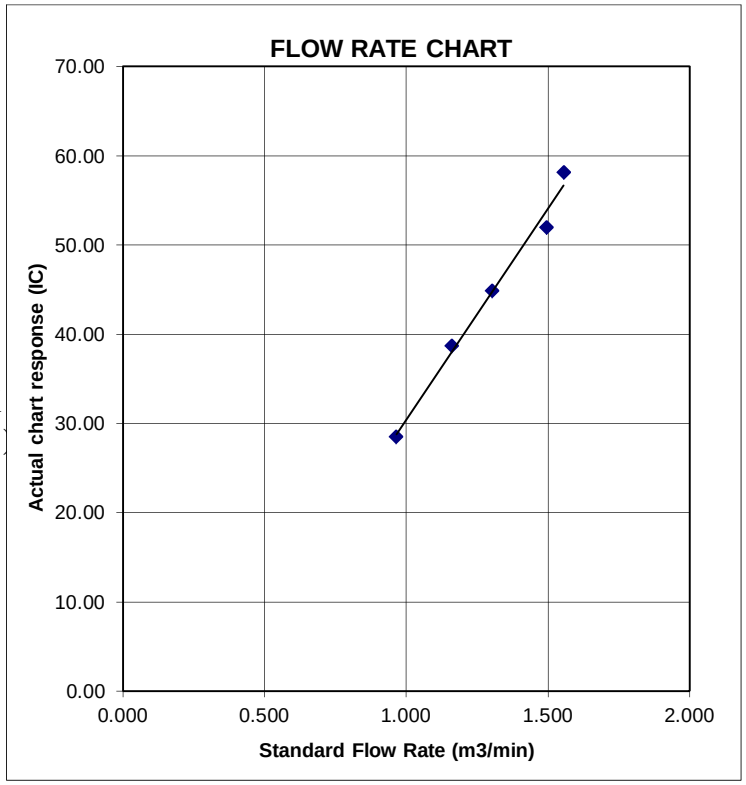
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House along Lok Ma Chau Road — Date of Calibration: 30-Dec-19
Location ID : DMS2A — Next Calibration Date: 29-Feb-20
Name and Model: TISCH HVS Model TE-5170 — Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020	Corrected Pressure (mm Hg)	765
Temperature (°C)	20.3	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.0968
Model->	5025A	Qstd Intercept ->	-0.00065
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.60	6.60	13.2	1.753	54	55.05	Slope = 33.9871
13	5.25	5.25	10.5	1.563	48	48.93	Intercept = -4.5744
10	4.10	4.10	8.2	1.381	42	42.81	Corr. coeff. = 0.9969
7	3.10	3.10	6.2	1.201	34	34.66	
5	1.60	1.60	3.2	0.863	25	25.48	

Calculations :

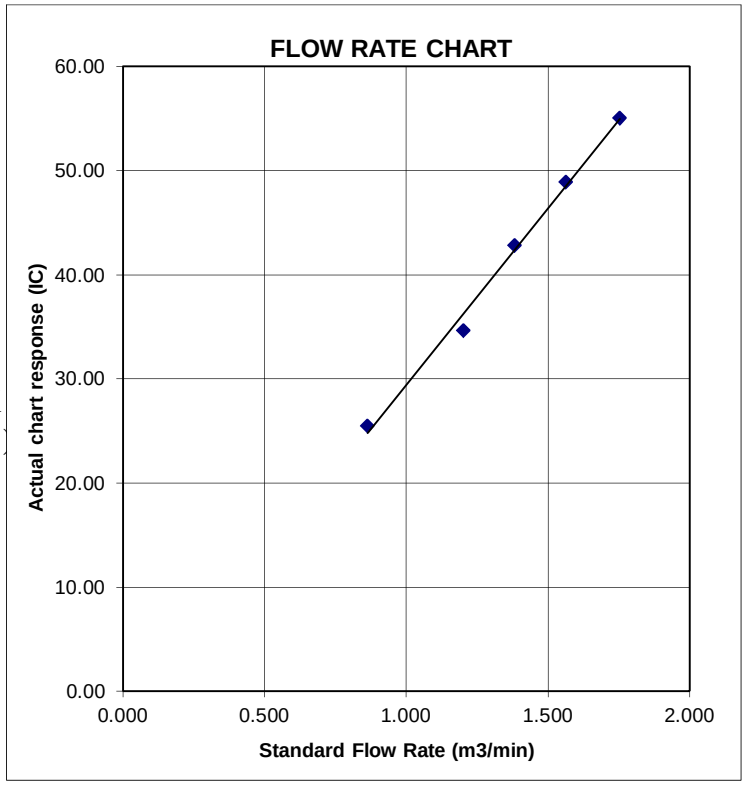
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House along Border Road
Location ID : DMS3
Name and Model: TISCH HVS Model TE-5170

Date of Calibration: 30-Dec-19
Next Calibration Date: 29-Feb-20
Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020	Corrected Pressure (mm Hg)	765
Temperature (°C)	20.3	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.0968
Model->	5025A	Qstd Intercept ->	-0.00065
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.35	6.35	12.7	1.719	53	54.03	Slope = 35.5694
13	5.15	5.15	10.3	1.548	46	46.89	Intercept = -7.6284
10	4.05	4.05	8.1	1.373	41	41.79	Corr. coeff. = 0.9952
7	2.70	2.70	5.4	1.121	30	30.58	
5	1.85	1.85	3.7	0.928	26	26.50	

Calculations :

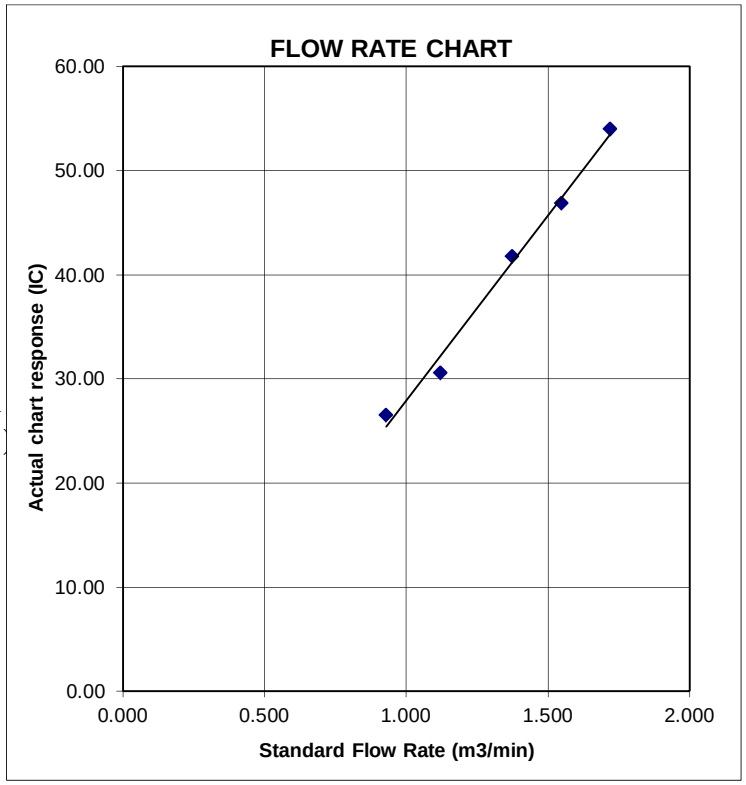
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Hong Kong Police Forec, Lok ma Chau
Operation Base at Horn Hill
Location ID : DMS4A

Date of Calibration: 30-Dec-19
Next Calibration Date: 29-Feb-20

Name and Model: TISCH HVS Model TE-5170

Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020	Corrected Pressure (mm Hg)	765
Temperature (°C)	20.3	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.0968
Model->	5025A	Qstd Intercept ->	-0.00065
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.00	6.00	12.0	1.671	53	54.03	Slope = 40.0323
13	5.05	5.05	10.1	1.533	48	48.93	Intercept = -12.2866
10	3.95	3.95	7.9	1.356	42	42.81	Corr. coeff. = 0.9986
7	2.50	2.50	5.0	1.079	31	31.60	
5	1.50	1.50	3.0	0.836	20	20.39	

Calculations :

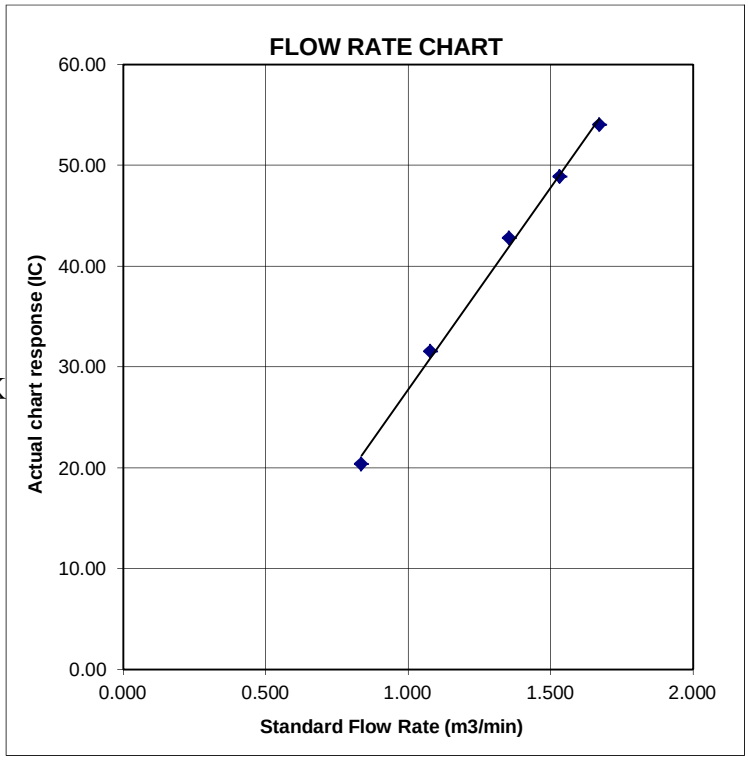
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

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



TISCH Environmental

RECALIBRATION DUE DATE:
February 5, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 5, 2019	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 753.1	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1941**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4830	3.2	2.00
2	3	4	1	1.0430	6.4	4.00
3	5	6	1	0.9300	7.9	5.00
4	7	8	1	0.8870	8.7	5.50
5	9	10	1	0.7320	12.7	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0036	0.6767	1.4197	0.9958	0.6714	0.8821
0.9993	0.9581	2.0078	0.9915	0.9506	1.2475
0.9973	1.0723	2.2448	0.9895	1.0640	1.3947
0.9962	1.1231	2.3544	0.9884	1.1144	1.4628
0.9908	1.3536	2.8395	0.9831	1.3431	1.7642
QSTD	**m=**	**2.09680**	**QA**	**m=**	**1.31298**
	b=	**-0.00065**		**b=**	**-0.00040**
	r=	**0.99999**		**r=**	**0.99999**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

TISCH Environmental

RECALIBRATION DUE DATE:
February 7, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 7, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 745.5	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	**m=**	**2.03014**	**QA**	**m=**	**1.27124**
	b=	**-0.04616**		**b=**	**-0.02917**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	:	MR BEN TAM	WORK ORDER	:	**HK1912131**
CLIENT	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	:	1
			DATE RECEIVED	:	20-MAR-2019
			DATE OF ISSUE	:	22-MAR-2019
PROJECT	:	----	NO. OF SAMPLES	:	1
			CLIENT ORDER	:	----

General Comments

- **Sample(s) were received in ambient condition.**
- **Sample(s) analysed and reported on an as received basis.**
- **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	General Manager

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

Results apply to sample(s) as submitted. 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	:	HK1912131
SUB-BATCH	:	1
CLIENT	:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT	:	----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1912131-001	S/N: 366418	AIR	20-Mar-2019	366418

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366418
Equipment Ref:	EQ108
Job Order	HK1912131

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	12 February 2019

Equipment Verification Results:

Calibration Date: 11 March 2019

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr00min	09:21 ~ 11:21	18.4	1014.9	0.021	2811	23.4
2hr00min	11:30 ~ 13:30	18.4	1014.9	0.025	3012	25.1
2hr00min	13:40 ~ 15:40	18.4	1014.9	0.032	3345	27.9

Sensitivity Adjustment Scale Setting (Before Calibration) 685 (CPM)

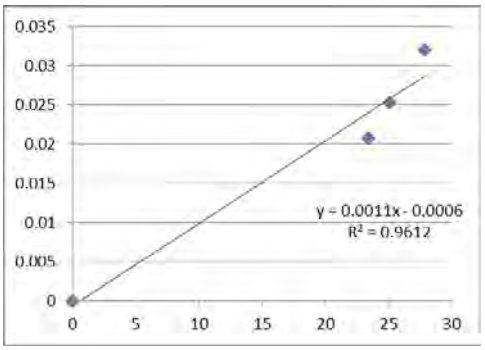
Sensitivity Adjustment Scale Setting (After Calibration) 685 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0011

Correlation Coefficient (R) 0.9804

Date of Issue 18 March 2019



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0011 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 18 March 2019

QC Reviewer : Ben Tam Signature : Date : 18 March 2019

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	12-Feb-19
Location ID :	Calibration Room	Next Calibration Date:	12-May-19

CONDITIONS

Sea Level Pressure (hPa)	1024.2	Corrected Pressure (mm Hg)	768.15
Temperature (°C)	19.0	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.02017
Model->	5025A	Qstd Intercept ->	-0.03691
Calibration Date->	13-Feb-18	Expiry Date->	13-Feb-19

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4	7.7	11.7	1.738	60	60.94	Slope = 35.5369
13	2.8	6.9	9.7	1.584	52	52.81	Intercept = -1.8924
10	1.9	5.4	7.3	1.377	46	46.72	Corr. coeff. = 0.9951
8	0.6	4	4.6	1.097	38	38.59	
5	-0.4	3.1	2.7	0.844	27	27.42	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

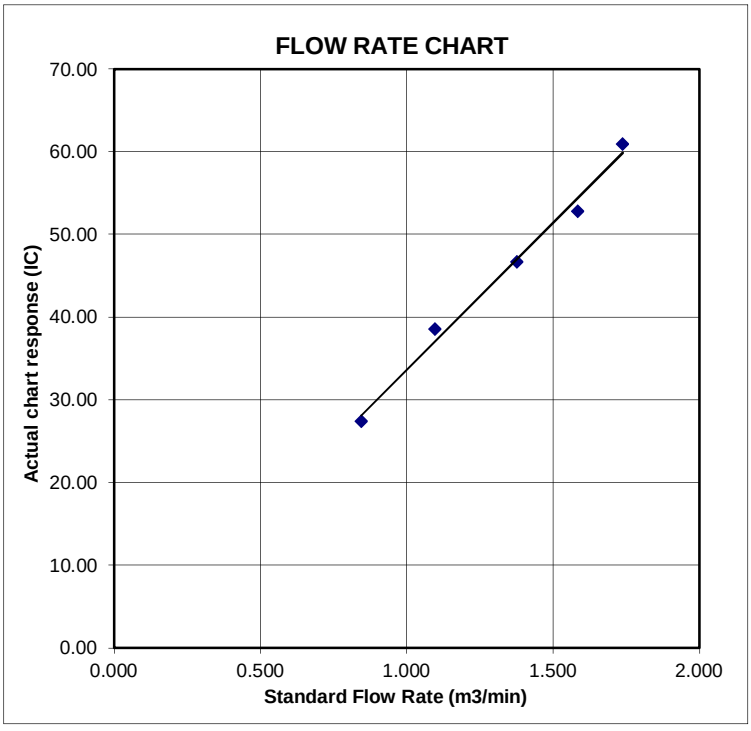
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 13, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	**m=**	**2.02017**	**QA**	**m=**	**1.26500**
	b=	**-0.03691**		**b=**	**-0.02263**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.cor
TOLL FREE: (877)263-761(
FAX: (513)467-900

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	:	MR BEN TAM	WORK ORDER	:	**HK1912135**
CLIENT	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	:	1
			DATE RECEIVED	:	20-MAR-2019
			DATE OF ISSUE	:	22-MAR-2019
PROJECT	:	----	NO. OF SAMPLES	:	1
			CLIENT ORDER	:	----

General Comments

- **Sample(s) were received in ambient condition.**
- **Sample(s) analysed and reported on an as received basis.**
- **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	General Manager

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

Results apply to sample(s) as submitted. 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	:	HK1912135
SUB-BATCH	:	1
CLIENT	:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT	:	----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1912135-001	S/N: 456658	AIR	20-Mar-2019	S/N: 456658

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	456658
Equipment Ref:	EQ115
Job Order	HK1912135

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	12 February 2019

Equipment Verification Results:

Calibration Date: 11 March 2019

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr00min	09:21 ~ 11:21	18.4	1014.9	0.021	3301	27.5
2hr00min	11:30 ~ 13:30	18.4	1014.9	0.025	3813	31.8
2hr00min	13:40 ~ 15:40	18.4	1014.9	0.032	4311	35.9

Sensitivity Adjustment Scale Setting (Before Calibration) 705 (CPM)

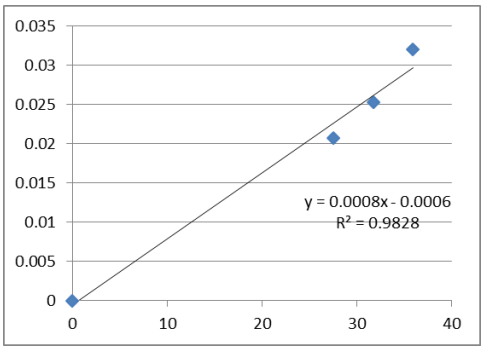
Sensitivity Adjustment Scale Setting (After Calibration) 705 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0008

Correlation Coefficient (R) 0.9914

Date of Issue 18 March 2019



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0008 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 18 March 2019

QC Reviewer : Ben Tam Signature : Date : 18 March 2019

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	12-Feb-19
Location ID :	Calibration Room	Next Calibration Date:	12-May-19

CONDITIONS

Sea Level Pressure (hPa)	1024.2	Corrected Pressure (mm Hg)	768.15
Temperature (°C)	19.0	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.02017
Model->	5025A	Qstd Intercept ->	-0.03691
Calibration Date->	13-Feb-18	Expiry Date->	13-Feb-19

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4	7.7	11.7	1.738	60	60.94	Slope = 35.5369
13	2.8	6.9	9.7	1.584	52	52.81	Intercept = -1.8924
10	1.9	5.4	7.3	1.377	46	46.72	Corr. coeff. = 0.9951
8	0.6	4	4.6	1.097	38	38.59	
5	-0.4	3.1	2.7	0.844	27	27.42	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

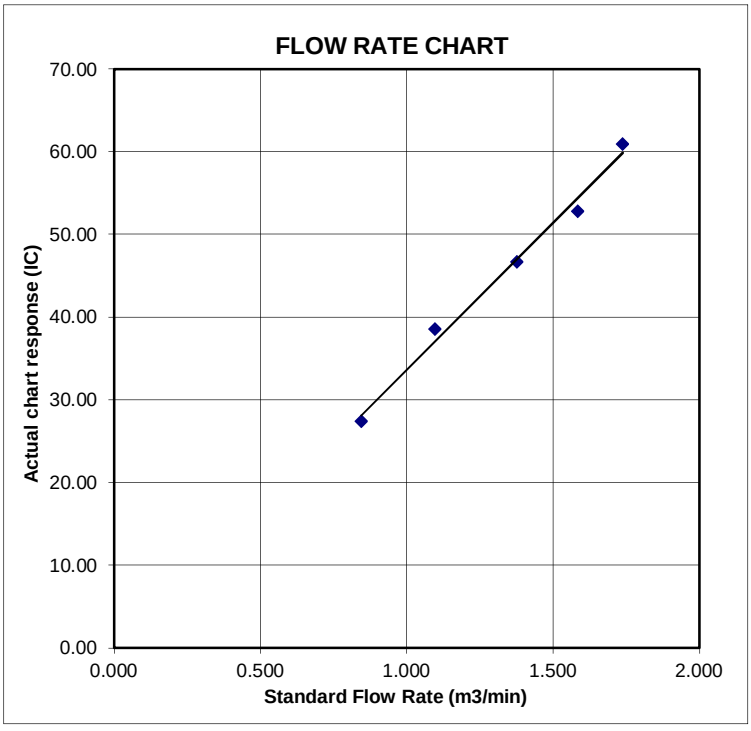
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 13, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	**m=**	**2.02017**	**QA**	**m=**	**1.26500**
	b=	**-0.03691**		**b=**	**-0.02263**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.cor
TOLL FREE: (877)263-761(
FAX: (513)467-900

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	:	MR BEN TAM	WORK ORDER	:	**HK1912133**
CLIENT	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	:	1
			DATE RECEIVED	:	20-MAR-2019
			DATE OF ISSUE	:	22-MAR-2019
PROJECT	:	----	NO. OF SAMPLES	:	1
			CLIENT ORDER	:	----

General Comments

- **Sample(s) were received in ambient condition.**
- **Sample(s) analysed and reported on an as received basis.**
- **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	General Manager

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

Results apply to sample(s) as submitted. 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 : HK1912133
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1912133-001	S/N: 3Y6501	AIR	20-Mar-2019	3Y6501

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6501
Equipment Ref:	EQ111
Job Order	HK1912133

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	12 February 2019

Equipment Verification Results:

Calibration Date: 11 March 2019

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr00min	09:21 ~ 11:21	18.4	1014.9	0.021	3650	30.4
2hr00min	11:30 ~ 13:30	18.4	1014.9	0.025	4111	34.3
2hr00min	13:40 ~ 15:40	18.4	1014.9	0.032	4611	38.4

Sensitivity Adjustment Scale Setting (Before Calibration) 657 (CPM)

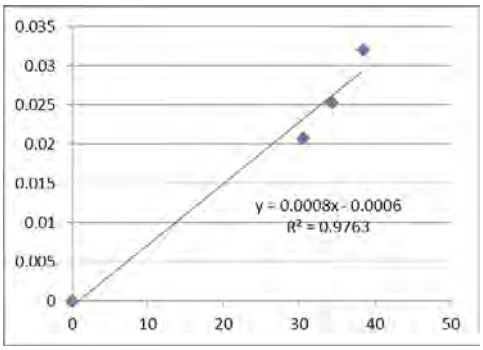
Sensitivity Adjustment Scale Setting (After Calibration) 656 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0008

Correlation Coefficient (R) 0.9881

Date of Issue 18 March 2019



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0008 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 18 March 2019

QC Reviewer : Ben Tam Signature : Date : 18 March 2019

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	12-Feb-19
Location ID :	Calibration Room	Next Calibration Date:	12-May-19

CONDITIONS

Sea Level Pressure (hPa)	1024.2	Corrected Pressure (mm Hg)	768.15
Temperature (°C)	19.0	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.02017
Model->	5025A	Qstd Intercept ->	-0.03691
Calibration Date->	13-Feb-18	Expiry Date->	13-Feb-19

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4	7.7	11.7	1.738	60	60.94	Slope = 35.5369
13	2.8	6.9	9.7	1.584	52	52.81	Intercept = -1.8924
10	1.9	5.4	7.3	1.377	46	46.72	Corr. coeff. = 0.9951
8	0.6	4	4.6	1.097	38	38.59	
5	-0.4	3.1	2.7	0.844	27	27.42	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

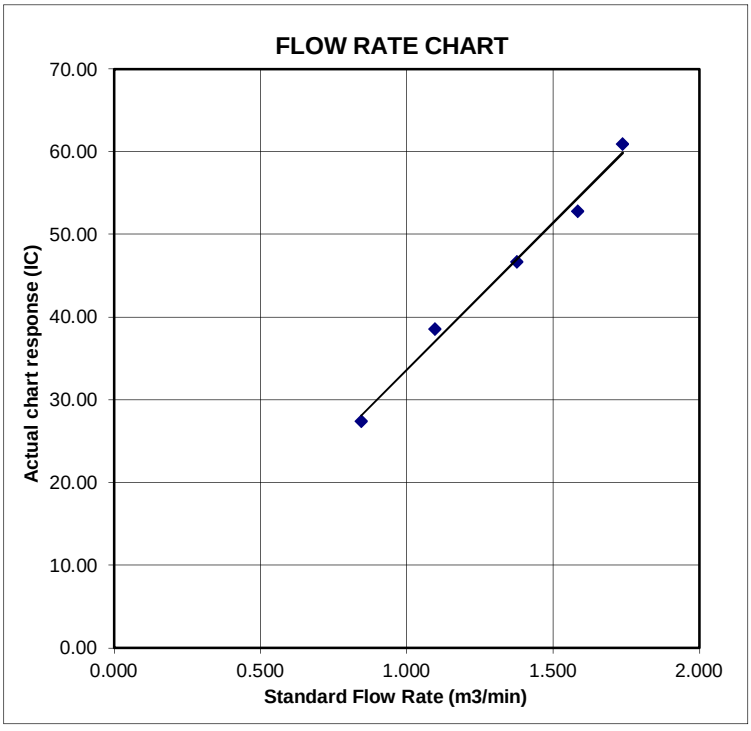
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 13, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	**m=**	**2.02017**	**QA**	**m=**	**1.26500**
	b=	**-0.03691**		**b=**	**-0.02263**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.cor
TOLL FREE: (877)263-761(
FAX: (513)467-900

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	:	MR BEN TAM	WORK ORDER	:	**HK1912134**
CLIENT	:	**ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	:	1
			DATE RECEIVED	:	20-MAR-2019
			DATE OF ISSUE	:	22-MAR-2019
PROJECT	:	----	NO. OF SAMPLES	:	1
			CLIENT ORDER	:	----

General Comments

- **Sample(s) were received in ambient condition.**
- **Sample(s) analysed and reported on an as received basis.**
- **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	General Manager

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

Results apply to sample(s) as submitted. 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 : HK1912134
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1912134-001	S/N: 3Y6502	AIR	20-Mar-2019	3Y6502

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6502
Equipment Ref:	EQ113
Job Order	HK1912134

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	12 February 2019

Equipment Verification Results:

Calibration Date: 11 March 2019

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr00min	09:21 ~ 11:21	18.4	1014.9	0.021	2670	22.3
2hr00min	11:30 ~ 13:30	18.4	1014.9	0.025	2917	24.3
2hr00min	13:40 ~ 15:40	18.4	1014.9	0.032	3301	27.5

Sensitivity Adjustment Scale Setting (Before Calibration) 573 (CPM)

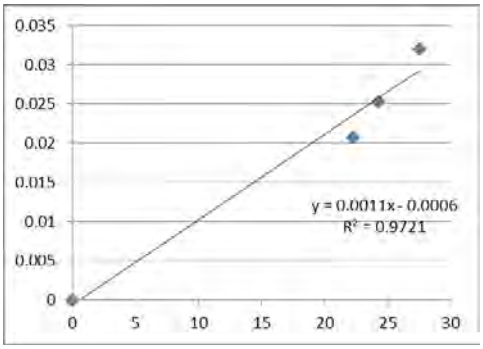
Sensitivity Adjustment Scale Setting (After Calibration) 573 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0011

Correlation Coefficient (R) 0.9860

Date of Issue 15 March 2019



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0011 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 15 March 2019

QC Reviewer : Ben Tam Signature : Date : 15 March 2019

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	12-Feb-19
Location ID :	Calibration Room	Next Calibration Date:	12-May-19

CONDITIONS

Sea Level Pressure (hPa)	1024.2	Corrected Pressure (mm Hg)	768.15
Temperature (°C)	19.0	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.02017
Model->	5025A	Qstd Intercept ->	-0.03691
Calibration Date->	13-Feb-18	Expiry Date->	13-Feb-19

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4	7.7	11.7	1.738	60	60.94	Slope = 35.5369
13	2.8	6.9	9.7	1.584	52	52.81	Intercept = -1.8924
10	1.9	5.4	7.3	1.377	46	46.72	Corr. coeff. = 0.9951
8	0.6	4	4.6	1.097	38	38.59	
5	-0.4	3.1	2.7	0.844	27	27.42	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

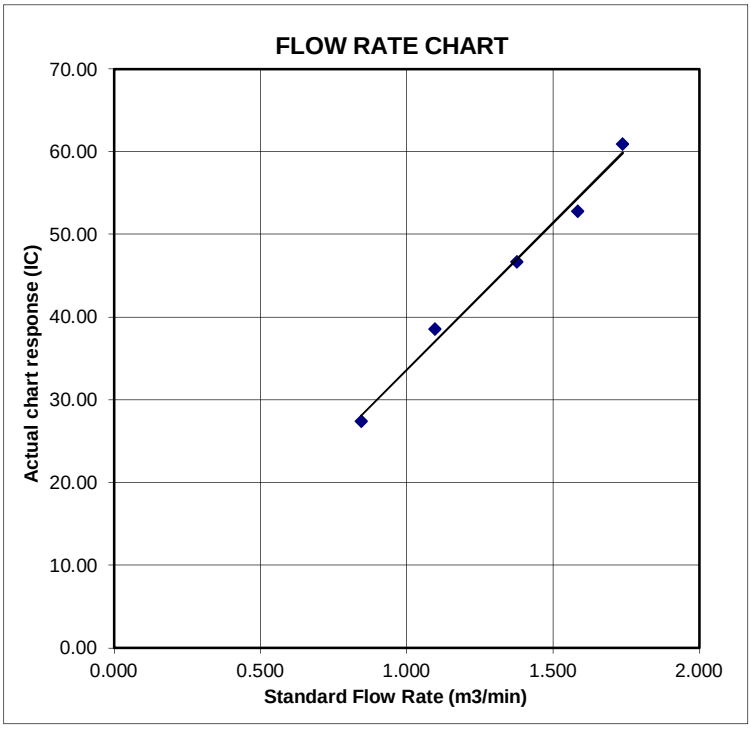
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 13, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	**m=**	**2.02017**	**QA**	**m=**	**1.26500**
	b=	**-0.03691**		**b=**	**-0.02263**
	r=	**0.99988**		**r=**	**0.99988**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.cor
TOLL FREE: (877)263-761(
FAX: (513)467-900

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C192957
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 30 May 2019

Description / 儀器名稱 : Sound Level Meter (EQ017)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2250
Serial No. / 編號 : 3012330
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 June 2019

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 12 June 2019

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 — 校正及檢測實驗所
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. : C192957
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 using laboratory acoustic calibrator was performed before the test 6.1.1.2 to 6.3.2.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C190176
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting		Applied Value		UUT Reading
Range (dB)	Main	Level (dB)	Freq. (kHz)	(dB)
20 - 140	LAF (SPL)	94.00	1	94.1

6.1.1.2 After Self-calibration

UUT Setting		Applied Value		UUT Reading	IEC 61672 Class 1
Range (dB)	Main	Level (dB)	Freq. (kHz)	(dB)	Spec. (dB)
20 - 140	LAF (SPL)	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting		Applied Value		UUT Reading
Range (dB)	Main	Level (dB)	Freq. (kHz)	(dB)
20 - 140	LAF (SPL)	94.00	1	94.0 (Ref.)
		104.00		104.0
		114.00		114.0

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

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 — 校正及檢測實驗所
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. : C192957
證書編號

6.2 Time Weighting

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq. (kHz)		
20 - 140	LAF (SPL)	94.00	1	94.0	Ref.
	LAS (SPL)			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting		Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Main	Level (dB)	Freq.		
20 - 140	LAF (SPL)	94.00	63 Hz	67.8	-26.2 ± 1.5
			125 Hz	77.8	-16.1 ± 1.5
			250 Hz	85.3	-8.6 ± 1.4
			500 Hz	90.7	-3.2 ± 1.4
			1 kHz	94.0	Ref.
			2 kHz	95.2	+1.2 ± 1.6
			4 kHz	95.0	+1.0 ± 1.6
			8 kHz	92.9	-1.1(+2.1 ; -3.1)
			12.5 kHz	89.3	-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)	Main	Level (dB)	Freq.		
20 - 140	LCF (SPL)	94.00	63 Hz	93.2	-0.8 ± 1.5
			125 Hz	93.8	-0.2 ± 1.5
			250 Hz	94.0	0.0 ± 1.4
			500 Hz	94.0	0.0 ± 1.4
			1 kHz	94.0	Ref.
			2 kHz	93.8	-0.2 ± 1.6
			4 kHz	93.2	-0.8 ± 1.6
			8 kHz	91.0	-3.0 (+2.1 ; -3.1)
			12.5 kHz	87.4	-6.2 (+3.0 ; -6.0)

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C192957
證書編號

Remarks : - UUT Microphone Model No. : 4189 & S/N : 3130396

- 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.

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 — 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C193172
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 18 June 2019

Description / 儀器名稱 : Integrating Sound Level Meter (EQ009)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285722
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 19 June 2019

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : Cheuk
K P Cheuk
Assistant Engineer

Certified By 核證 :
K C Lee
Engineer

Date of Issue 簽發日期 : 20 June 2019

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 — 校正及檢測實驗所
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. : C193172
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 using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C190176
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
52 - 132	L_{AFP}	A	F	94.00	1	94.3

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
52 - 132	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
52 - 132	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

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 — 校正及檢測實驗所
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. : C193172
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
52 - 132	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.0	± 0.1
	L_{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
32 - 112	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
52 - 132	L_{AFP}	A	F	94.00	31.5 Hz	54.5	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	94.9	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C193172
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
52 - 132	L_{CFP}	C	F	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.1	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
32 - 112	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.8	± 0.5
			60 sec.			$1/10^3$		80	79.1	± 1.0
			5 min.			$1/10^4$		70	69.1	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812706

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	: 31.5 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)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- 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.

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C192956
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 30 May 2019

Description / 儀器名稱 : Sound Calibrator (EQ082)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2713428
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 June 2019

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 12 June 2019

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 — 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C192956
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C183775
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : 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.

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 — 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C193752
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 9 July 2019

Description / 儀器名稱 : Sound Calibrator (EQ086)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-74
Serial No. / 編號 : 34657230
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 16 July 2019

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : Cheuk
K P Cheuk
Assistant Engineer

Certified By 核證 :
K C Lee
Engineer

Date of Issue 簽發日期 : 22 July 2019

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 — 校正及檢測實驗所
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

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C193752
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C183775
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.002	1 kHz ± 1 %	± 1

Remark : 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.

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 — 校正及檢測實驗所
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

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK2001852
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	13-Jan-2020
		DATE OF ISSUE:	17-Jan-2020

COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen and Temperature
Equipment Type:	Dissolved Oxygen Meter
Brand Name/ Model No.:	YSI 550A
Serial No./ Equipment No.:	05F2063AZ
Date of Calibration:	16-Jan-2020

NOTES

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

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2001852

SUB-BATCH: 0
DATE OF ISSUE: 17-Jan-2020
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Dissolved Oxygen Meter
Brand Name/ Model No.: YSI 550A
Serial No./ Equipment No.: 05F2063AZ
Date of Calibration: 16-Jan-2020 Date of Next Calibration: 16-Apr-2020

PARAMETERS:

Dissolved Oxygen Method Ref: APHA (21st edition), 4500-O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.95	4.87	-0.08
6.06	6.08	+0.02
7.20	7.39	+0.19
	Tolerance Limit (mg/L)	±0.20

Temperature Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
11.0	11.1	+0.1
21.0	20.2	-0.8
41.0	39.4	-1.6
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK2001850
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	13-Jan-2020
		DATE OF ISSUE:	17-Jan-2020

COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name/ Model No.:	Hach 2100Q
Serial No./ Equipment No.:	11030C008499
Date of Calibration:	16-Jan-2020

NOTES

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

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2001850

SUB-BATCH: 0
DATE OF ISSUE: 17-Jan-2020
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Turbidimeter
Brand Name/ Model No.: Hach 2100Q
Serial No./ Equipment No.: 11030C008499
Date of Calibration: 16-Jan-2020 Date of Next Calibration: 16-Apr-2020

PARAMETERS:
Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.39	--
4	4.22	+5.5
40	36.8	-8.0
80	73.6	-8.0
400	385	-3.8
800	739	-7.6
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK1951767
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH: LABORATORY: DATE RECEIVED: DATE OF ISSUE:	0 HONG KONG 06-Dec-2019 13-Dec-2019

COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	pH Value and Temperature
Equipment Type:	pH meter
Brand Name/ Model No.:	AZ 8685
Serial No./ Equipment No.:	1246609
Date of Calibration:	13-Dec-2019

NOTES

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

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1951767

SUB-BATCH: 0
DATE OF ISSUE: 13-Dec-2019
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: pH meter
Brand Name/ Model No.: AZ 8685
Serial No./ Equipment No.: 1246609
Date of Calibration: 13-Dec-2019 Date of Next Calibration: 13-Mar-2020

PARAMETERS:

pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	4.1	+0.10
7.0	6.8	-0.20
10.0	10.0	+0.00
	Tolerance Limit (pH unit)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
12.0	12.5	+0.5
21.5	21.0	-0.5
41.5	40.5	-1.0
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK1951768
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	06-Dec-2019
		DATE OF ISSUE:	13-Dec-2019

COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Salinity
Equipment Type:	Salinity Meter
Brand Name/ Model No.:	AZ 8371
Serial No./ Equipment No.:	1219392
Date of Calibration:	13-Dec-2019

NOTES

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

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1951768

SUB-BATCH: 0
DATE OF ISSUE: 13-Dec-2019
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Salinity Meter
Brand Name/ Model No.: AZ 8371
Serial No./ Equipment No.: 1219392
Date of Calibration: 13-Dec-2019 Date of Next Calibration: 13-Mar-2020

PARAMETERS:
Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.9	-1.0
20	18.6	-7.0
30	29.7	-1.0
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

Appendix F

Event and Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC,ER and Contractor; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; and 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Notify Contractor.	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Rectify any unacceptable practice and implement remedial measures; and 3. Amend working methods agreed with ER if appropriate.
Exceedance for two or more consecutive samples	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC,ER and Contractor; 3. Advise the ER and Contractor on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC, ER and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; and 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 and ER on the effectiveness of the proposed remedial measures; and 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; and 3. Supervise and ensure remedial measures properly implemented.	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Submit proposals for remedial actions to ER with a copy to ET and IEC within 3 working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal if appropriate.
LIMIT LEVEL				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor, IEC 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 ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Advise the ER and ET on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; and 3. Supervise and ensure remedial measures properly implemented.	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER with a copy to ET and IEC within 3 working days of notification; 4. Implement the agreed proposals; and 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify IEC, ER, 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, Contractor and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; and 5. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise and ensure remedial measures properly implemented; and 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.	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER with a copy to ET and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Construction Noise

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC, ER and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; and 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; and 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; and 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC and ER; and 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure Remedial measures properly implemented; and 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; and 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Water Quality

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Inform IEC, Contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; and 3. Discuss remedial measures with IEC and Contractor and ER.	1. Discuss with ET, ER and Contractor on the implemented Mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; and 3. Supervise the implementation of agreed.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with ER, ET and IEC and purpose remedial measures to IEC and ER; and 7. Implement the agreed mitigation measures.
Action level being exceeded by two or more consecutive sampling days	1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Check monitoring data, all plant, equipment and Contractor's working methods; 4. Discuss remedial measures with IEC, contractor and ER; and 5. Ensure remedial measures are implemented	1. Discuss with ET, Contractor and ER on the implemented Mitigation measures; 2. Review the proposed remedial Measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the proposed mitigation measures; 2. Make agreement on the remedial measures to be implemented ; and 3. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of remedial measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Consider changes of working methods; 6. Discuss mitigation measures with IEC, ER and Contractor; and 7. Ensure the agreed remedial measures are implemented.	1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the Implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures.
Limit level being exceeded by two or more consecutive sampling days	1. Inform IEC, contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; 3. Discuss mitigation measures with IEC, ER and Contractor; and 4. Ensure mitigation measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days	1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with ET and IEC on the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the dredging activities until no exceedance of Limit level.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures. 7. As directed by the ER, to slow down or stop all or part of the dredging activities until no exceedance of Limit level.

Appendix G

Monitoring Schedule

Impact Monitoring Schedule for Reporting Month – February 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Water quality
2	3	4 Water quality 24-hr TSP	5 1-hr TSP X3 Noise	6 Water quality	7	8 Water quality
9	10 24-hr TSP	11 Water quality 1-hr TSP X3 Noise	12	13 Water quality	14	15 Water quality 24-hr TSP
16	17 1-hr TSP X3 Noise	18 Water quality	19	20 Water quality	21 24-hr TSP	22 Water quality 1-hr TSP X3
23	24	25 Water quality	26	27 Water quality 24-hr TSP	28 1-hr TSP X3 Noise	29 Water quality

Impact Monitoring Schedule for next Reporting Month – March 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 Water quality	4 24-hr TSP	5 Water quality 1-hr TSP X3 Noise	6	7 Water quality
8	9	10 Water quality 24-hr TSP	11 1-hr TSP X3 Noise	12 Water quality	13	14 Water quality
15	16 24-hr TSP	17 Water quality 1-hr TSP X3 Noise	18	19 Water quality	20	21 Water quality 24-hr TSP
22	23 1-hr TSP X3 Noise	24 Water quality	25	26 Water quality	27 24-hr TSP	28 Water quality 1-hr TSP X3
29	30 Water quality	31				

Appendix H

Database of Monitoring Result

24-hour TSP Monitoring Database

Location DMS-1 – Village House along Ha Wan Tsuen Road

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
4-Feb-20	25321	15745.46	15769.46	1440.00	48	48	48.0	15	1020	1.39	2005	2.8175	2.8611	0.0436	22
10-Feb-20	25325	15769.46	15793.46	1440.00	46	46	46.0	17	1018.8	1.35	1937	2.8437	2.9722	0.1285	66
15-Feb-20	25466	15793.46	15817.46	1440.00	48	48	48.0	21	1013.6	1.38	1985	2.7980	2.8780	0.0800	40
21-Feb-20	25470	15817.46	15841.46	1440.00	48	48	48.0	17	1018.1	1.39	1998	2.7865	2.8795	0.0930	47
27-Feb-20	25338	15841.46	15865.46	1440.00	46	46	46.0	17	1017.9	1.34	1936	2.8326	2.9434	0.1108	57

Location DMS-2A – Village House along Lok Ma Chau Road

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
4-Feb-20	24836	12913.06	12938.05	1499.40	48	48	48.0	15	1020	1.58	2363	2.6948	2.7433	0.0485	21
10-Feb-20	25326	12938.05	12962.05	1440.00	48	48	48.0	17	1018.8	1.57	2261	2.7894	2.9607	0.1713	76
15-Feb-20	25467	12962.05	12986.05	1440.00	44	44	44.0	21	1013.6	1.44	2071	2.7773	2.8570	0.0797	38
21-Feb-20	25471	12986.12	13010.12	1440.00	46	46	46.0	17	1018.1	1.51	2174	2.7982	2.8414	0.0432	20
27-Feb-20	25337	13010.12	13034.12	1440.00	46	46	46.0	17	1017.9	1.51	2174	2.7884	2.8640	0.0756	35

Location DMS-3 – Village House along Border Road

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
4-Feb-20	25320	10730.95	10754.95	1440.00	30	30	30.0	15	1020	1.08	1548	2.8191	2.852	0.0329	21
10-Feb-20	25327	10754.95	10778.95	1440.00	30	30	30.0	17	1018.8	1.07	1543	2.8189	2.8594	0.0405	26
15-Feb-20	25468	10778.95	10802.95	1440.00	30	30	30.0	21	1013.6	1.06	1532	2.7812	2.8672	0.0860	56
21-Feb-20	25472	10802.95	10826.95	1440.00	30	30	30.0	17	1018.1	1.07	1543	2.7846	2.8714	0.0868	56
27-Feb-20	25336	10826.95	10850.95	1440.00	28	28	28.0	17	1017.9	1.01	1461	2.8201	2.8603	0.0402	28

Location DMS-4A – Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
4-Feb-20	25319	16209.06	16233.06	1440.00	32	32	32.0	15	1020	1.12	1617	2.8170	2.8700	0.0530	33
10-Feb-20	25328	16233.06	16257.06	1440.00	32	32	32.0	17	1018.8	1.12	1612	2.7847	2.8294	0.0447	28
15-Feb-20	25469	16257.06	16281.06	1440.00	32	32	32.0	21	1013.6	1.11	1601	2.8091	2.8558	0.0467	29
21-Feb-20	25332	16281.06	16305.06	1440.00	34	34	34.0	17	1018.1	1.17	1685	2.7891	2.8537	0.0646	38
27-Feb-20	25335	16305.06	16329.06	1440.00	34	34	34.0	17	1017.9	1.17	1685	2.7786	2.8223	0.0437	26

Construction Noise Monitoring Results, dB(A)

NMS-1 - Village House Ha Wan Tsuen

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
5-Feb-20	9:08	61.7	63.8	49.2	60.5	64.2	49.3	59.4	62.2	49.2	60.1	62.3	49.4	60.1	62.4	49.2	61.2	63.5	49.3	61	NA
11-Feb-20	9:10	59.9	61.8	51.3	55.6	58.3	52.8	55.1	58.8	51.8	53.7	55.8	50.8	56.9	59.8	50.3	62.1	64.8	52.8	58	NA
17-Feb-20	9:03	62.1	64.9	57.9	65.3	67.9	60.9	63.3	65.4	59.9	62.5	64.4	59.4	61.9	63.4	59.9	62.9	64.4	60.9	63	NA
28-Feb-20	9:18	60.4	62.3	51.8	56.1	58.8	53.3	55.6	59.3	52.3	57.8	58.9	54.9	62.8	65.4	59.4	59.3	59.9	58.4	59	NA

NMS-2 - Village House along existing Ha Wan Tsuen East Road

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
5-Feb-20	9:41	62.0	64.6	56.1	62.6	66.1	54.6	64.2	68.1	59.1	63.0	65.6	59.1	61.1	64.1	58.1	64.8	68.1	59.1	63	66
11-Feb-20	10:30	65.2	67.0	61.5	63.2	68.0	58.5	63.7	66.5	59.5	65.9	69.0	59.0	69.4	73.0	61.5	67.9	73.0	61.0	66	69
17-Feb-20	11:03	63.8	65.9	51.3	62.6	66.3	51.4	61.5	64.3	51.3	62.2	64.4	51.5	62.2	64.5	51.3	63.3	65.6	51.4	63	66
28-Feb-20	9:59	61.6	63.8	50.9	61.6	63.9	50.7	62.7	65.0	50.8	60.1	61.9	56.4	58.1	62.9	53.4	58.6	61.4	54.4	61	64

NMS-3 - Village house along Border Road

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
5-Feb-20	10:31	63.8	66.8	59.8	61.4	62.8	58.3	60.3	62.8	57.3	60.3	61.8	57.8	59.3	62.3	54.8	58.4	60.8	54.8	61	64
11-Feb-20	13:38	57.0	57.7	55.7	57.8	59.7	55.7	56.7	61.7	54.2	56.1	57.2	53.2	61.1	63.7	57.7	57.6	58.2	56.7	58	61
17-Feb-20	13:08	63.1	66.1	56.1	62.0	65.6	56.1	61.7	64.6	57.1	60.3	63.1	55.6	64.5	67.1	59.6	61.5	64.6	56.6	62	65
28-Feb-20	11:00	57.8	60.4	53.9	55.9	58.9	52.9	59.6	62.9	53.9	59.1	62.1	52.1	58.0	61.6	52.1	57.7	60.6	53.1	58	61

NMS-4A - Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
5-Feb-20	13:33	54.9	57.7	50.7	58.1	60.7	53.7	56.1	58.2	52.7	55.3	57.2	52.2	54.7	56.2	52.7	55.7	57.2	53.6	56	59
11-Feb-20	14:49	53.1	55.9	48.9	56.3	58.9	51.9	54.3	56.4	50.9	55.2	55.4	50.4	52.9	54.4	50.9	53.9	55.4	51.9	54	57
17-Feb-20	14:11	58.0	60.1	45.5	56.8	60.5	45.6	55.7	58.5	45.5	56.4	58.6	45.7	56.4	58.7	45.5	57.5	59.8	45.6	57	60
28-Feb-20	13:20	60.9	63.1	58	60.3	62.5	58.3	61.3	63.2	59.3	57.9	59.3	55.8	60	61.8	55.8	59.6	60.8	55.3	60	63

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
1-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:45	1.46	17.2	17.2	8.35	8.3	85.4	85.3	7.1	6.8	5.66	5.66	7.90	7.9	8	8.5
			17.2		8.3		85.1		6.4		5.66		7.90		9	
IS1	10:25	1.38	17.2	17.2	13.92	13.9	143.9	144.1	17.0	17.1	5.86	5.86	8.20	8.2	22	21.0
			17.2		13.95		144.2		17.1		5.86		8.20		20	
BS1	10:00	0.91	17	17.0	11.44	11.4	118.4	118.1	40.7	40.8	5.20	5.20	7.80	7.8	28	29.5
			17		11.4		117.8		40.9		5.20		7.80		31	
IS2	9:50	0.20	17.1	17.1	6.98	7.0	73.1	73.1	15.2	14.6	4.87	4.87	7.50	7.5	28	29.5
			17.1		6.97		73.0		13.9		4.87		7.50		31	
CS5	10:25	0.13	16.9	16.9	9.55	9.6	100.2	100.4	7.4	7.4	0.3	0.30	8.70	8.7	6	7.0
			16.9		9.58		100.6		7.3		0.3		8.70		8	
IS4	11:15	0.08	17	17.0	6.01	6.0	62.3	62.4	963.0	934.0	0.10	0.10	7.80	7.8	6860	11180.0
			17		6.02		62.4		905.0		0.10		7.80		15500	
IS6	10:10	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018

Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results

4-Feb-20

Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:26	1.50	19	19.1	7.35	7.3	84.6	84.3	8.3	8.3	5.70	5.70	8.25	8.3	5	5.5
			19.1		7.29		84.0		8.3		5.70		8.25		6	
IS1	10:09	1.46	19.2	19.2	8.59	8.6	97.8	98.1	17.7	17.9	6.12	6.12	8.32	8.3	20	19.0
			19.2		8.66		98.4		18.1		6.12		8.32		18	
BS1	9:46	0.93	18.8	18.8	9.23	9.2	105.0	104.8	23.7	23.9	6.13	6.13	8.40	8.4	20	19.5
			18.8		9.2		104.6		24.1		6.13		8.40		19	
IS2	10:51	0.20	18.5	18.5	9.06	9.1	102.4	102.6	20.3	20.6	6.11	6.11	8.07	8.1	17	17.5
			18.5		9.08		102.7		20.9		6.11		8.07		18	
CS5	13:15	0.13	19.1	19.1	9.34	9.4	102.4	102.5	12.2	11.4	0.23	0.23	8.50	8.5	28	21.0
			19.1		9.36		102.6		10.5		0.23		8.50		14	
IS4	12:25	0.08	19	19.0	4.8	4.8	52.2	52.5	661.0	659.5	0.09	0.09	8.10	8.1	2050	1915.0
			19		4.84		52.8		658.0		0.09		8.10		1780	
IS6	13:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
6-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:29	1.51	19.1	19.1	6.38	6.4	72.5	72.8	9.7	9.6	5.74	5.74	7.72	7.7	7	6.5
			19.1		6.39		73.1		9.6		5.74		7.72		6	
IS1	10:08	1.44	18.8	18.8	8.11	8.1	92.8	92.8	18.8	18.9	6.76	6.76	7.69	7.7	14	13.5
			18.8		8.1		92.8		19.0		6.76		7.69		13	
BS1	9:46	0.90	19.3	19.3	6.95	7.0	80.1	80.3	26.3	25.6	6.75	6.75	7.59	7.6	20	19.5
			19.3		6.98		80.5		25.0		6.75		7.59		19	
IS2	11:08	0.21	18.6	18.6	7.65	7.7	91.5	91.6	16.5	16.8	14.14	14.14	7.45	7.5	13	13.5
			18.6		7.66		91.6		17.2		14.14		7.45		14	
CS5	14:10	0.13	19.5	19.5	8.42	8.4	97.1	97.3	7.5	7.4	0.07	0.07	8.10	8.1	5	6.0
			19.5		8.45		97.5		7.3		0.07		8.10		7	
IS4	13:20	0.08	19.2	19.2	5.27	5.3	61.4	61.5	529.0	528.0	0.06	0.06	8.00	8.0	2150	1915.0
			19.2		5.28		61.6		527.0		0.06		8.00		1680	
IS6	14:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
8-Feb-20
Weather condition: Rainy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:49	1.49	19.3	19.3	6.45	6.4	72.8	72.8	9.9	9.5	6.91	6.91	7.61	7.6	10	10.0
			19.3		6.44		72.7		9.2		6.91		7.61		10	
IS1	10:26	1.40	18.7	18.7	7.73	7.7	87.3	86.8	23.4	22.8	7.70	7.70	7.77	7.8	11	10.5
			18.7		7.63		86.3		22.1		7.70		7.77		10	
BS1	10:03	0.93	18.8	18.8	7.53	7.5	85.4	85.3	20.9	20.0	7.55	7.55	7.92	7.9	10	10.5
			18.8		7.52		85.1		19.1		7.55		7.92		11	
IS2	11:09	0.20	18.5	18.5	6.88	6.9	8.1	8.1	16.4	16.1	14.03	14.03	7.43	7.4	16	16.0
			18.5		6.87		8.1		15.8		14.03		7.43		16	
CS5	12:15	0.13	18.7	18.7	9.05	9.0	97.7	97.6	4.2	4.1	0.04	0.02	8.20	8.2	10	9.0
			18.7		9.04		97.5		4.0		0.00		8.20		8	
IS4	11:25	0.08	18.5	18.5	5.91	5.9	63.5	63.6	442.0	444.0	0.09	0.09	8.10	8.1	494	713.5
			18.5		5.92		63.7		446.0		0.09		8.10		933	
IS6	12:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
11-Feb-20
Weather condition: Rainy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:55	1.40	17.3	17.3	8.81	8.7	94.4	92.6	23.6	22.9	7.95	7.95	7.60	7.6	4	4.0
			17.3		8.63		90.7		22.1		7.95		7.60		4	
IS1	10:36	0.90	17.1	17.1	7.04	7.1	74.8	74.9	22.3	22.0	5.23	5.23	7.60	7.6	10	9.5
			17.1		7.09		75.0		21.7		5.23		7.60		9	
BS1	10:20	0.20	17.3	17.3	7.01	7.0	82.6	82.7	10.3	9.8	6.51	6.50	7.70	7.7	6	6.0
			17.3		7.05		82.7		9.3		6.49		7.70		6	
IS2	11:27	0.20	17.8	17.7	6.2	6.2	72.0	72.4	15.9	16.4	9.31	9.31	7.70	7.7	30	30.0
			17.5		6.25		72.8		16.8		9.31		7.70		30	
CS5	11:45	0.13	17.5	17.5	9.21	9.2	108.0	108.1	13.2	12.3	0.04	0.04	8.20	8.2	36	36.5
			17.5		9.22		108.2		11.4		0.04		8.20		37	
IS4	10:55	0.08	17.7	17.7	5.92	5.9	63.8	63.9	263.0	250.0	0.09	0.09	8.10	8.1	629	623.0
			17.7		5.94		63.9		237.0		0.09		8.10		617	
IS6	11:55	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
13-Feb-20
Weather condition: Rainy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:40	1.58	19.6	19.6	7.83	7.8	85.3	85.2	4.8	4.8	7.90	7.90	7.00	7.0	7	6.5
			19.6		7.8		85.1		4.9		7.90		7.00		6	
IS1	10:15	1.47	19.4	19.4	8.97	8.9	97.8	97.7	6.9	6.9	8.41	8.41	7.00	7.0	12	12.5
			19.4		8.91		97.5		6.8		8.41		7.00		13	
BS1	9:50	0.96	19.4	19.4	9.56	9.6	103.8	103.9	7.3	7.4	8.51	8.51	6.90	6.9	9	8.5
			19.4		9.59		103.9		7.5		8.51		6.90		8	
IS2	10:00	0.20	19.3	19.3	7.36	7.4	83.1	83.2	11.6	11.9	4.93	4.93	6.70	6.7	28	29.5
			19.3		7.38		83.2		12.1		4.93		6.70		31	
CS5	10:40	0.15	19.1	19.1	9.31	9.3	105.4	105.5	7.1	7.2	0.31	0.31	8.00	8.0	8	8.0
			19.1		9.33		105.6		7.3		0.31		8.00		8	
IS4	11:25	0.20	19	19.0	7.65	7.7	86.5	86.6	461.0	466.0	0.07	0.07	7.40	7.4	3310	3375.0
			19		7.66		86.6		471.0		0.07		7.40		3440	
IS6	10:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
15-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:45	1.52	21.6	21.6	7.22	7.2	82.3	82.4	7.5	7.5	7.82	7.82	6.60	6.6	8	7.5
			21.6		7.25		82.4		7.4		7.82		6.60		7	
IS1	10:25	1.48	21.8	21.8	7.32	7.3	83.1	83.3	8.4	8.5	8.52	8.52	6.50	6.5	11	10.5
			21.8		7.36		83.4		8.6		8.52		6.50		10	
BS1	10:00	0.99	21.2	21.2	8.15	8.1	93.0	92.9	15.2	15.3	6.67	6.67	6.40	6.4	16	17.5
			21.2		8.1		92.7		15.4		6.67		6.40		19	
IS2	10:10	0.20	21.3	21.3	7.32	7.3	82.7	82.7	30.8	31.5	6.81	6.81	7.00	7.0	35	32.5
			21.3		7.33		82.7		32.2		6.81		7.00		30	
CS5	10:35	0.15	21.5	21.5	9.32	9.3	108.4	108.3	7.1	7.0	0.29	0.29	8.40	8.4	12	12.5
			21.5		9.3		108.1		6.9		0.29		8.40		13	
IS4	11:20	0.15	20.1	20.1	4.97	5.0	54.5	55.1	28.6	27.8	0.17	0.17	6.90	6.9	39	42.0
			20.1		5.04		55.6		26.9		0.17		6.90		45	
IS6	10:20	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
18-Feb-20
Weather condition: Fine

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:50	1.44	15.9	15.9	7.78	7.8	79.8	80.1	6.6	6.6	7.90	7.90	6.90	6.9	9	9.5
			15.9		7.83		80.3		6.5		7.90		6.90		10	
IS1	10:15	1.31	15.1	15.1	10.08	10.1	101.5	101.6	9.5	9.9	8.27	8.27	6.90	6.9	11	11.5
			15.1		10.11		101.7		10.3		8.27		6.90		12	
BS1	9:50	0.90	15.3	15.3	8.15	8.1	83.5	83.4	18.3	18.4	6.76	6.76	6.90	6.9	21	21.5
			15.3		8.1		83.3		18.4		6.76		6.90		22	
IS2	10:00	0.18	15.2	15.2	7.87	7.9	82.5	82.6	29.2	30.2	6.75	6.75	7.00	7.0	27	28.5
			15.2		7.87		82.6		31.2		6.75		7.00		30	
CS5	10:40	0.13	15.6	15.6	13.15	13.2	131.7	131.8	26.8	25.1	0.24	0.24	8.00	8.0	44	44.0
			15.6		13.16		131.8		23.3		0.24		8.00		44	
IS4	11:10	0.11	15.5	15.5	6.65	6.7	69.5	69.6	37.6	36.8	0.16	0.16	7.80	7.8	103	96.5
			15.5		6.66		69.6		35.9		0.16		7.80		90	
IS6	10:20	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
20-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(˚C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:50	1.46	19.1	19.1	9.86	9.8	106.0	105.7	6.5	6.4	7.93	7.93	7.40	7.4	10	10.5
			19.1		9.8		105.3		6.4		7.93		7.40		11	
IS1	10:30	1.33	18.4	18.4	13.01	13.0	137.9	137.7	8.7	8.8	7.85	7.85	7.40	7.4	12	12.5
			18.4		12.97		137.5		9.0		7.85		7.40		13	
BS1	10:05	0.91	18.6	18.6	9.5	9.5	101.3	101.5	18.0	17.7	7.37	7.37	7.20	7.2	20	24.5
			18.6		9.55		101.6		17.4		7.37		7.20		29	
IS2	10:05	0.22	18.6	18.6	6.95	7.0	75.7	75.8	14.7	14.1	6.77	6.77	7.20	7.2	17	20.0
			18.6		6.95		75.8		13.4		6.77		7.20		23	
CS5	10:35	0.13	18.7	18.7	9.32	9.3	102.1	102.2	14.4	13.6	0.23	0.23	8.10	8.1	32	34.0
			18.7		9.33		102.2		12.7		0.23		8.10		36	
IS4	11:20	0.12	18.4	18.4	6.21	6.2	67.7	67.8	22.2	23.3	0.16	0.16	7.90	7.9	47	44.5
			18.4		6.22		67.8		24.3		0.16		7.90		42	
IS6	10:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
22-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(°C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:40	1.50	21.8	21.8	11.51	11.5	131.2	131.3	7.9	8.0	7.97	7.97	7.70	7.7	14	13.5
			21.8		11.55		131.4		8.1		7.97		7.70		13	
IS1	10:15	1.36	21.4	21.4	14.9	14.9	168.4	168.6	9.2	9.1	7.81	7.81	7.70	7.7	15	14.0
			21.4		14.99		168.8		9.0		7.81		7.70		13	
BS1	9:55	0.95	21.4	21.4	13.35	13.3	150.9	150.8	12.3	12.9	7.90	7.90	7.40	7.4	16	16.0
			21.4		13.3		150.7		13.4		7.90		7.40		16	
IS2	10:00	0.21	21.6	21.6	6.49	6.5	73.6	73.7	23.3	23.2	6.76	6.76	7.10	7.1	25	25.5
			21.6		6.51		73.8		23.1		6.76		7.10		26	
CS5	10:40	0.14	21.8	21.8	8.61	8.6	97.7	97.8	26.6	26.5	0.26	0.26	8.00	8.0	47	47.5
			21.8		8.65		97.9		26.3		0.26		8.00		48	
IS4	11:10	0.12	21.4	21.4	6.23	6.2	70.5	70.6	18.8	18.2	0.22	0.22	7.70	7.7	47	91.5
			21.4		6.24		70.6		17.6		0.22		7.70		136	
IS6	10:25	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
25-Feb-20
Weather condition: Cloudy

Location	Sampling Time	Depth (m)	Temperature(°C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:55	0.25	22.7	22.7	8.98	9.0	104.0	104.2	8.0	8.0	8.02	8.02	7.60	7.6	15	16.0
			22.7		9.02		104.3		8.0		8.02		7.60		17	
IS1	10:35	0.26	22.1	22.1	13.09	13.1	149.9	150.1	10.2	10.2	7.91	7.91	7.70	7.7	19	18.0
			22.1		13.11		150.2		10.1		7.91		7.70		17	
BS1	10:10	0.24	22.6	22.6	13.61	13.6	157.7	157.6	13.0	12.5	8.02	8.02	7.70	7.7	18	19.0
			22.6		13.58		157.4		12.0		8.02		7.70		20	
IS2	10:10	0.20	21.9	21.9	9.91	9.9	113.3	113.4	17.0	17.1	8.21	8.21	7.30	7.3	27	26.0
			21.9		9.92		113.4		17.1		8.21		7.30		25	
CS5	10:05	0.14	22.2	22.2	7.39	7.4	86.1	86.2	10.9	10.5	0.23	0.23	7.90	7.9	81	55.5
			22.2		7.4		86.3		10.1		0.23		7.90		30	
IS4	11:30	0.11	22	22.0	6.07	6.1	70.6	70.7	25.5	24.1	0.11	0.11	7.80	7.8	72	70.5
			22		6.08		70.7		22.6		0.11		7.80		69	
IS6	10:35	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
27-Feb-20
Weather condition: Fine

Location	Sampling Time	Depth (m)	Temperature(°C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:50	1.50	23.3	23.3	7.43	7.4	86.8	86.8	9.7	9.8	7.96	7.96	7.40	7.4	20	20.0
			23.3		7.4		86.7		9.9		7.96		7.40		20	
IS1	10:25	1.45	22.9	22.9	11.28	11.3	132.2	132.4	17.6	17.7	7.97	7.97	7.50	7.5	23	23.5
			22.9		11.33		132.6		17.8		7.97		7.50		24	
BS1	10:00	0.90	23.1	23.1	9.64	9.6	112.7	112.4	31.3	30.9	7.80	7.80	7.40	7.4	44	44.5
			23.1		9.6		112.1		30.4		7.80		7.40		45	
IS2	10:10	0.21	23.1	23.1	7.22	7.2	85.2	85.3	19.2	20.2	8.15	8.15	7.10	7.1	25	25.5
			23.1		7.24		85.3		21.2		8.15		7.10		26	
CS5	10:45	0.14	22.2	22.2	11.58	11.6	133.3	133.4	12.7	12.2	0.2	0.23	8.00	8.0	24	23.5
			22.2		11.59		133.4		11.6		0.2		8.00		23	
IS4	11:20	0.08	19.5	19.5	3.97	3.9	43.2	43.0	837.0	810.0	0.14	0.14	7.90	7.9	2800	2330.0
			19.5		3.9		42.8		783.0		0.14		7.90		1860	
IS6	10:10	0*														

* No water quality monitoring could be conducted at IS6 which was found dried up completely

Contract No. WD/11/2018
Development of Lok Ma Chau Loop: Land Decontamination and Advance Engineering Works – Environmental Team

Water Quailty Monitoring Results
29-Feb-20
Weather condition: Fine

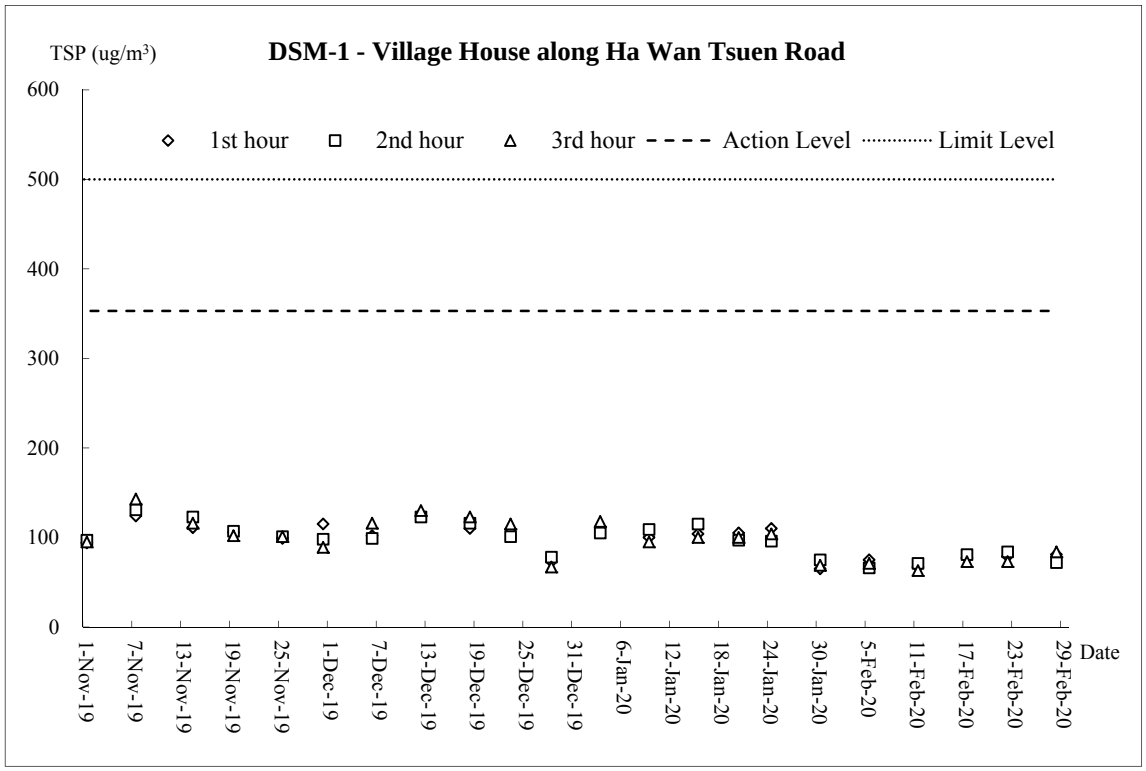
Location	Sampling Time	Depth (m)	Temperature(°C)		DO (mg/L)		DO (%)		Turbidity (NTU)		Salinity (ppt)		pH		SS(mg/L)	
			Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
CS1	10:45	1.48	24.2	24.4	7.66	7.7	91.3	91.6	9.7	9.5	7.92	7.92	7.10	7.1	14	14.0
			24.6		7.7		91.8		9.4		7.92		7.10		14	
IS1	10:20	1.40	23.6	23.6	11.16	11.2	132.1	132.3	12.1	12.3	7.51	7.51	7.10	7.1	18	18.5
			23.6		11.22		132.5		12.4		7.51		7.10		19	
BS1	9:55	0.98	23.8	23.8	9.65	9.6	114.4	114.1	19.5	19.8	7.19	7.19	7.00	7.0	23	23.0
			23.8		9.61		113.8		20.1		7.19		7.00		23	
IS2	9:50	0.20	23.8	23.8	6.39	6.4	75.3	75.4	17.4	16.4	8.13	8.13	6.90	6.9	21	20.5
			23.8		6.4		75.4		15.4		8.13		6.90		20	
CS5	10:20	0.14	22.5	22.5	8.97	9.0	105.8	105.9	19.2	18.2	0.2	0.22	7.80	7.8	30	30.0
			22.5		8.99		106.0		17.1		0.2		7.80		30	
IS4	11:10	0.08	22.6	22.6	4.15	4.2	48.9	49.0	532.0	515.5	0.12	0.12	7.50	7.5	2100	2105.0
			22.6		4.16		49.0		499.0		0.12		7.50		2110	
IS6		0*														

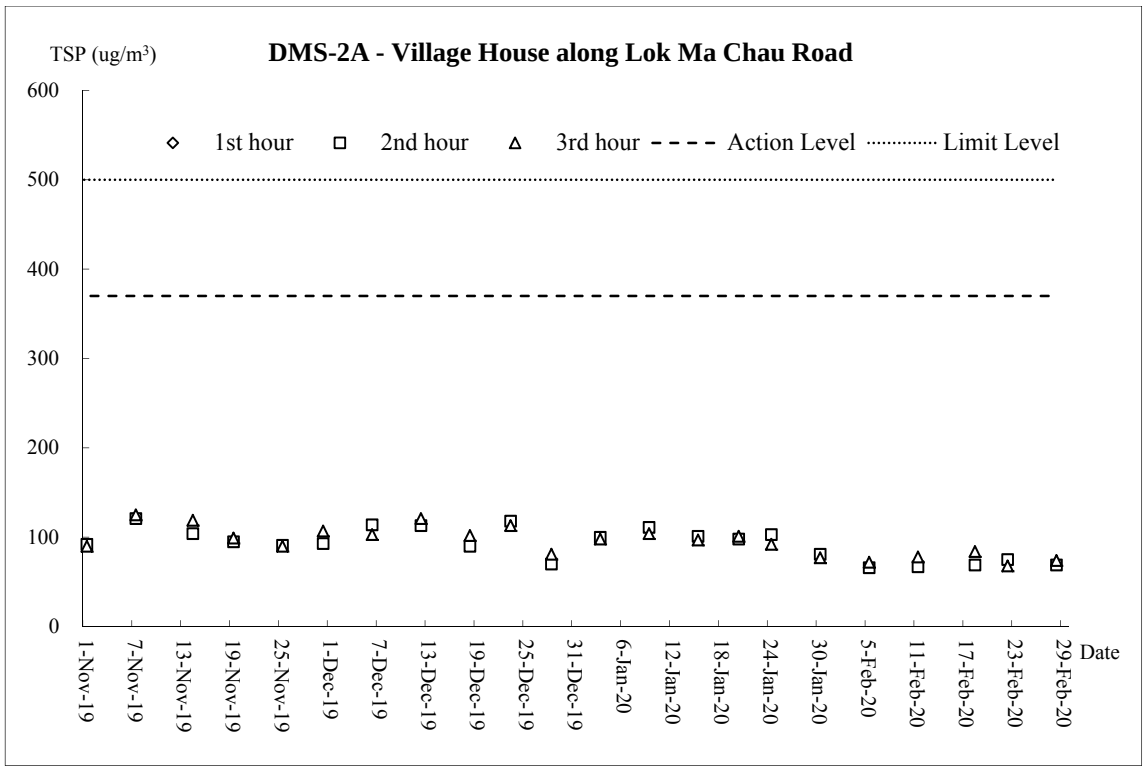
* No water quality monitoring could be conducted at IS6 which was found dried up completely

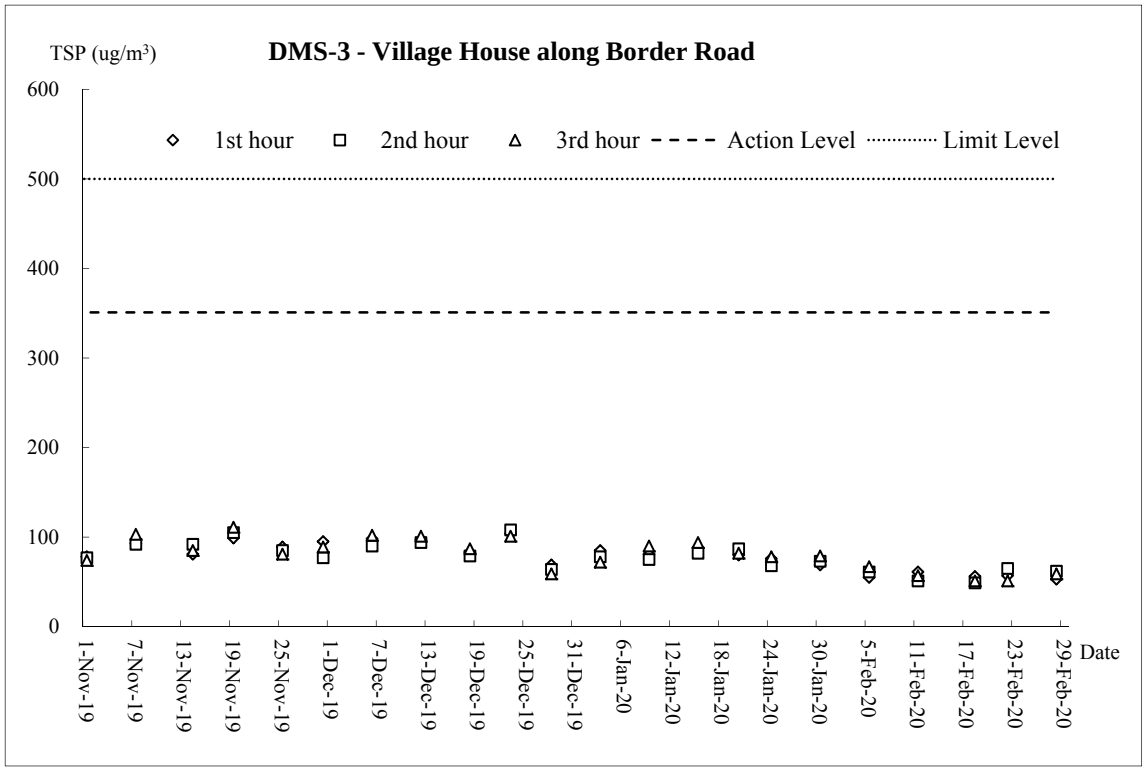
Appendix I

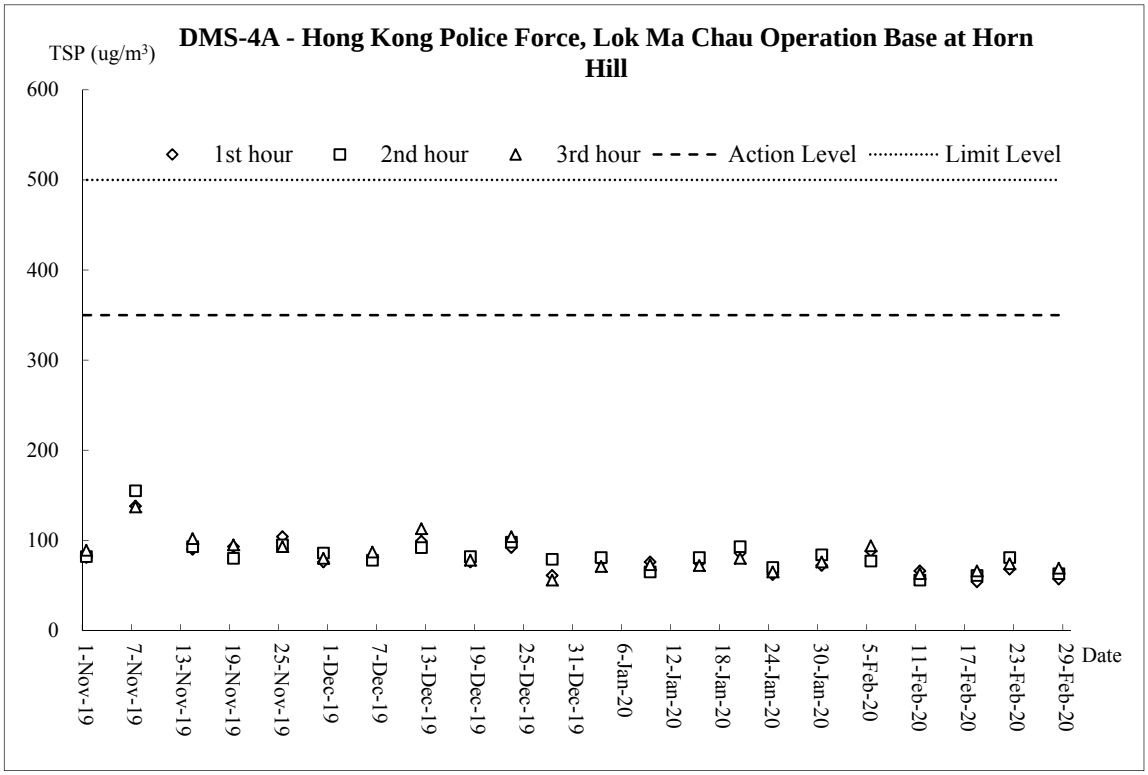
Graphical Plots for Monitoring Result

Air Quality – 1-hour TSP



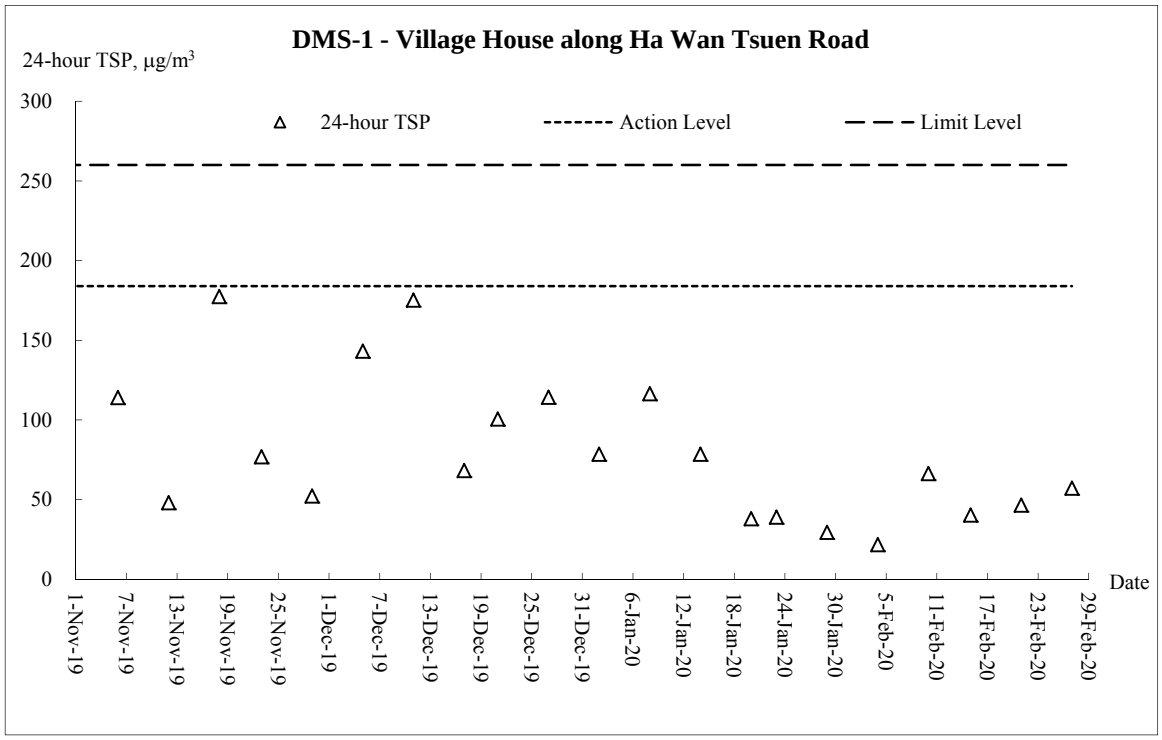


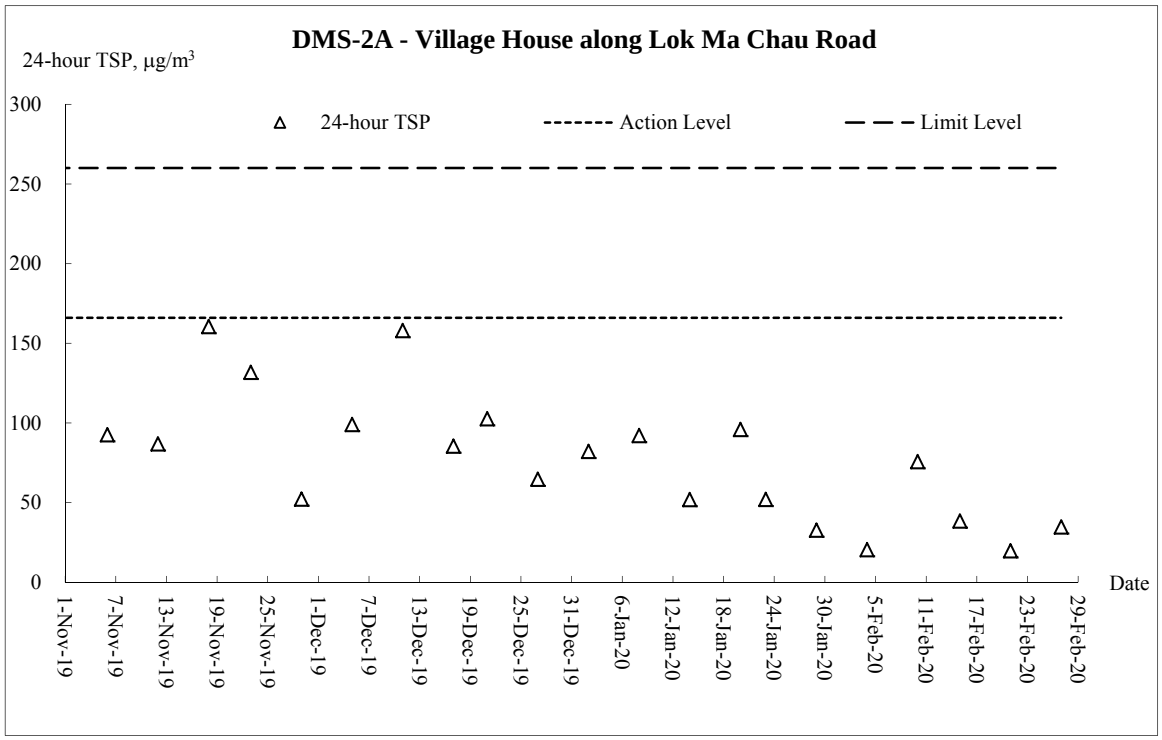

DMS-3 - Village House along Border Road
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

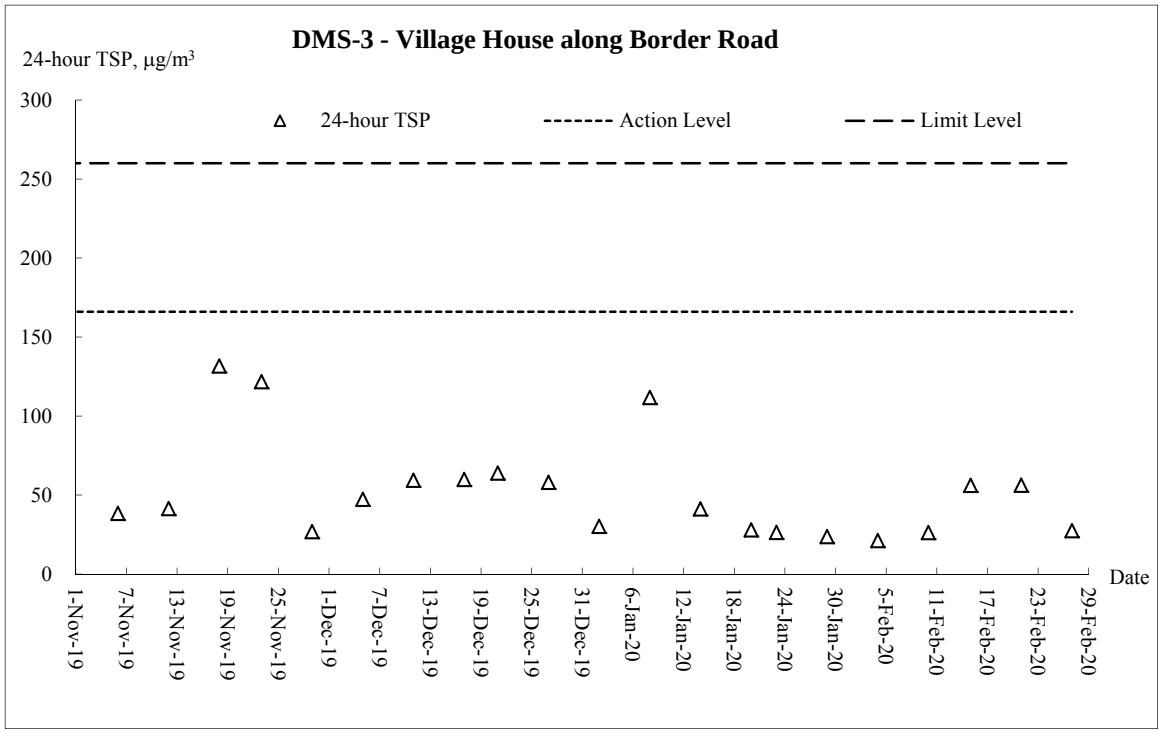

DMS-4A - Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

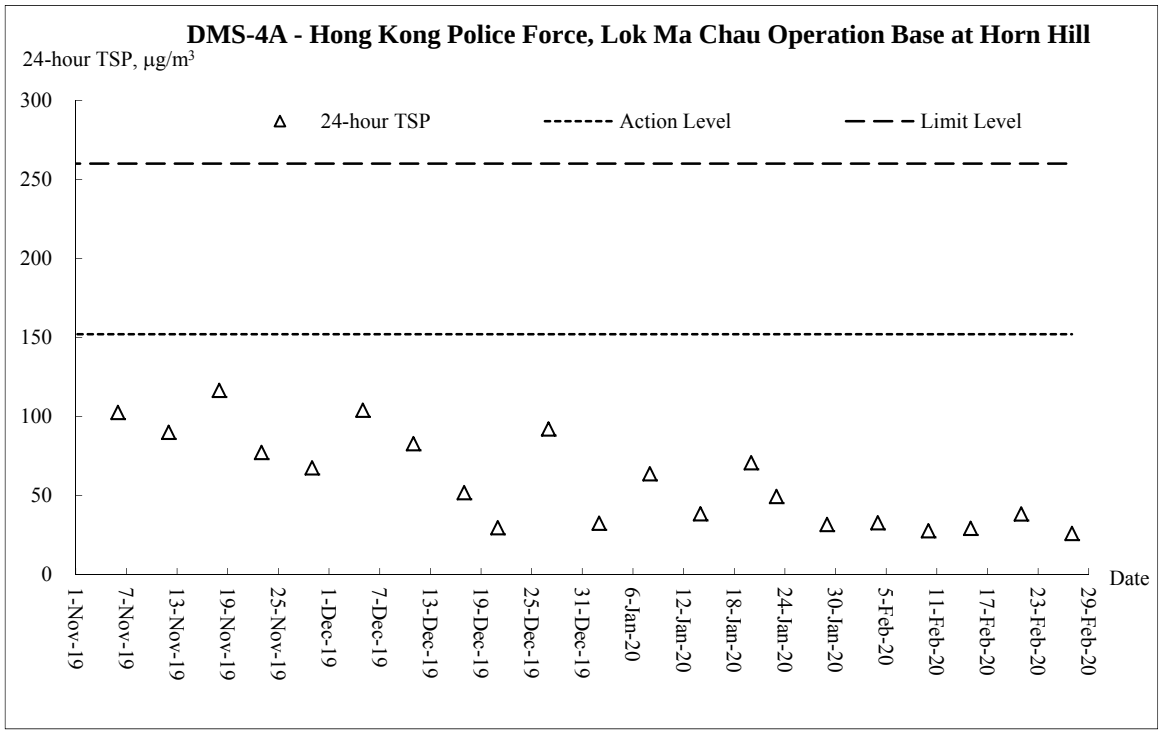
.

Air Quality – 24-hour TSP

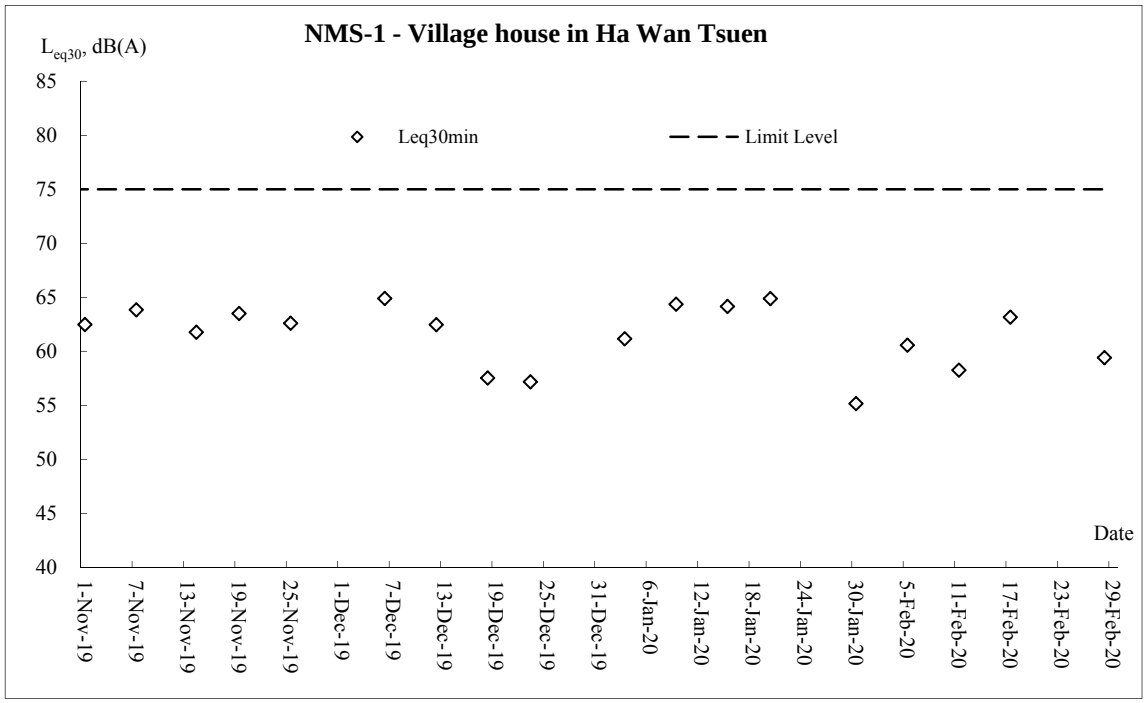


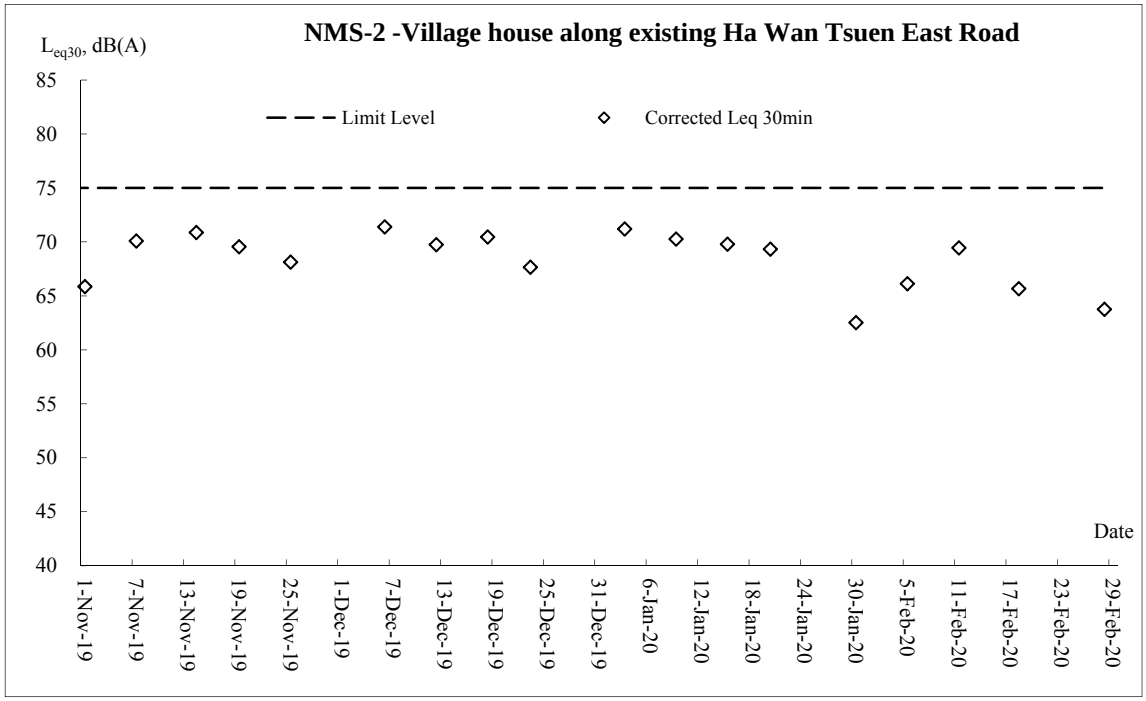


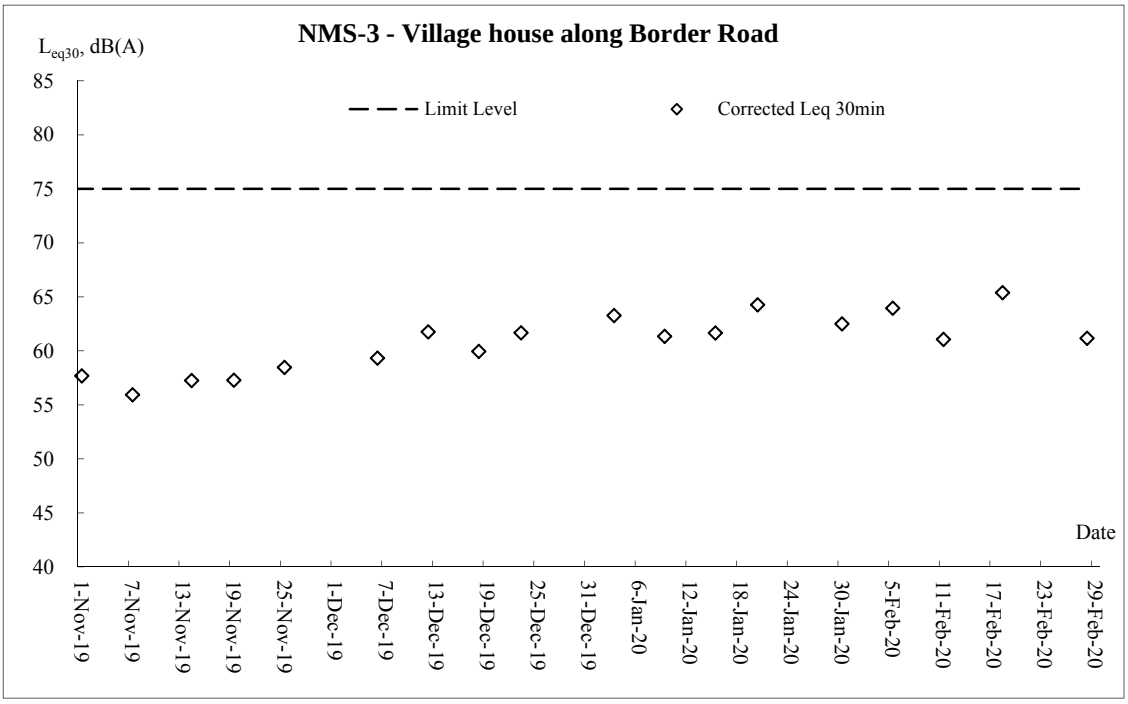

DMS-3 - Village House along Border Road
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
Date
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

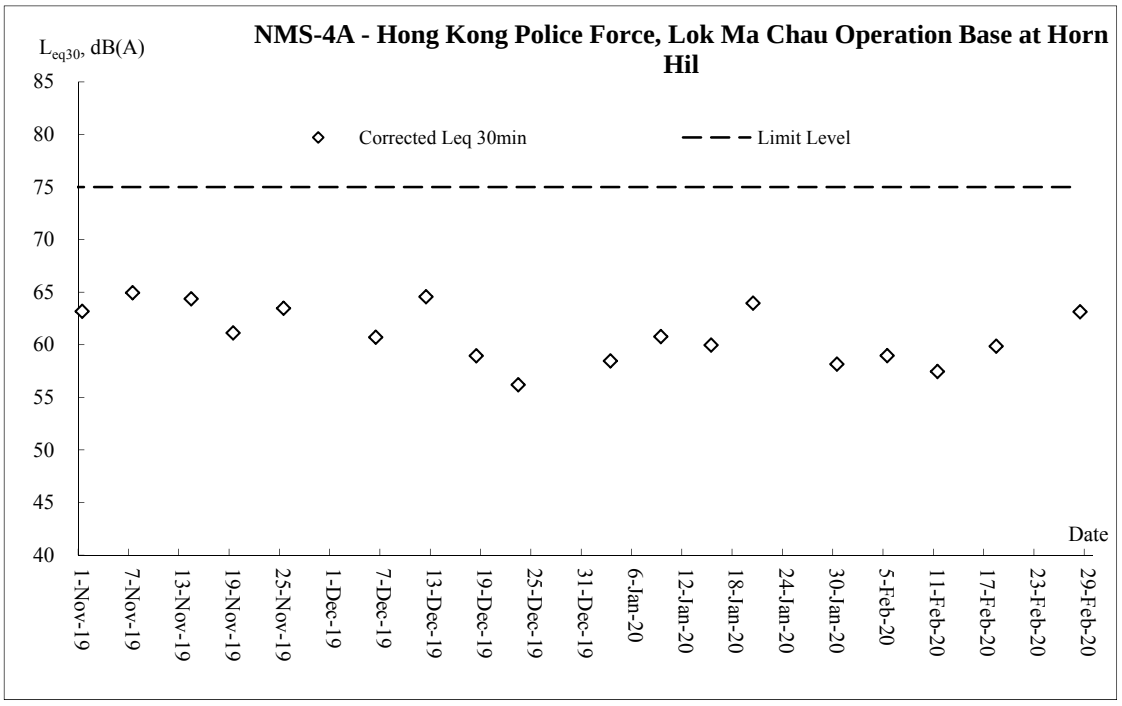

DMS-4A - Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hill
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
Date
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

Noise

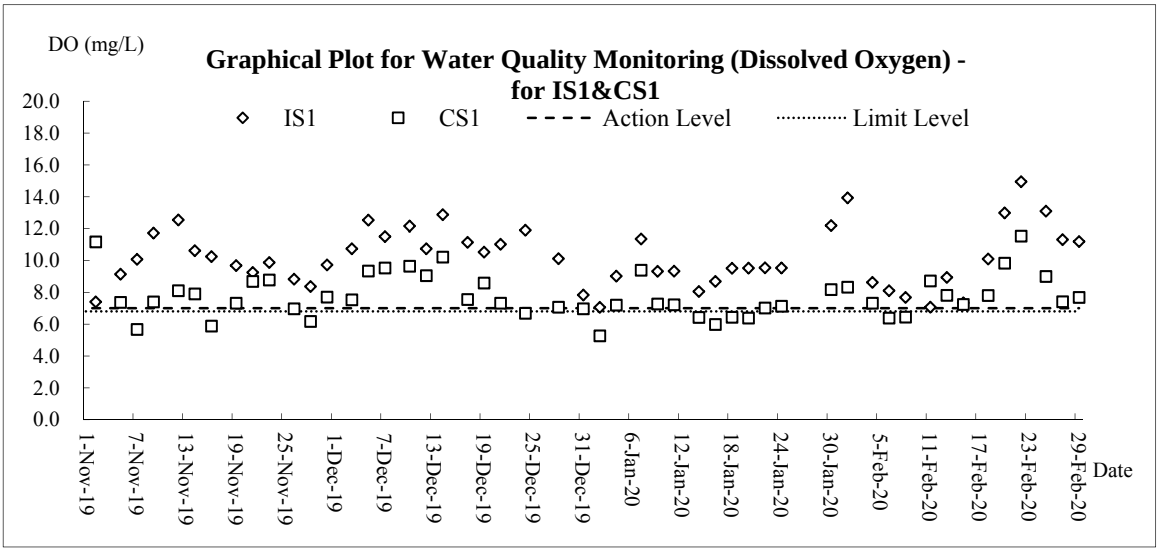

NMS-1 - Village house in Ha Wan Tsuen
L_{eq30}, dB(A)
Leq30min
Limit Level
Date
85
80
75
70
65
60
55
50
45
40
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

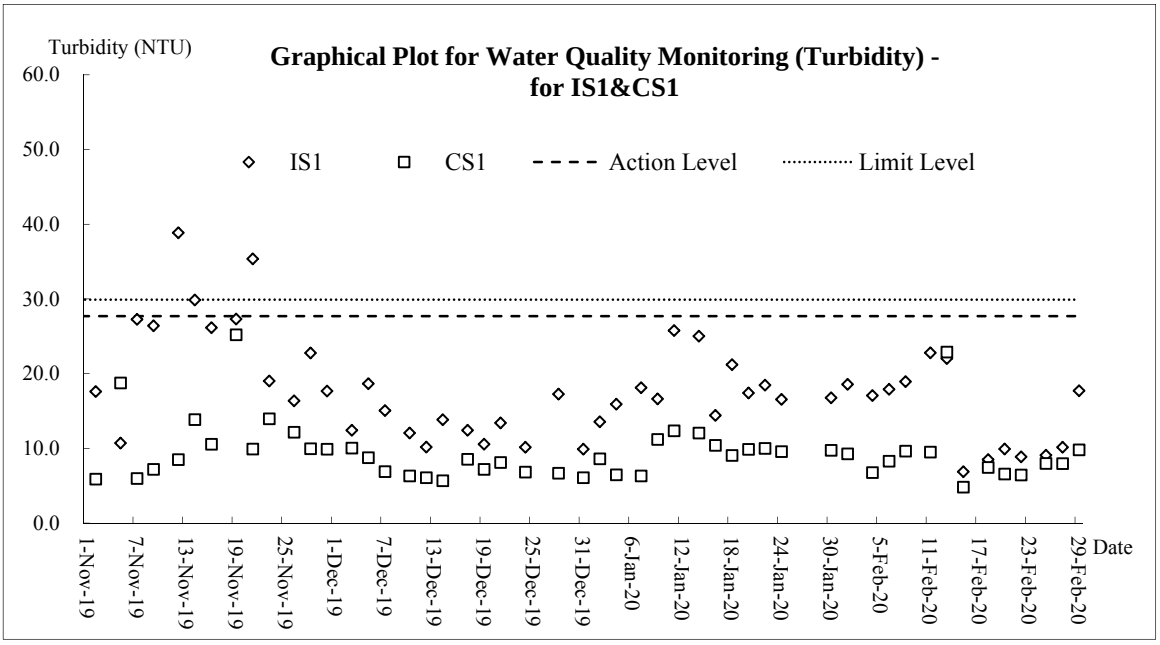

NMS-2 -Village house along existing Ha Wan Tsuen East Road
L_{eq30}, dB(A)
Limit Level
Corrected Leq 30min
Date
85
80
75
70
65
60
55
50
45
40
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

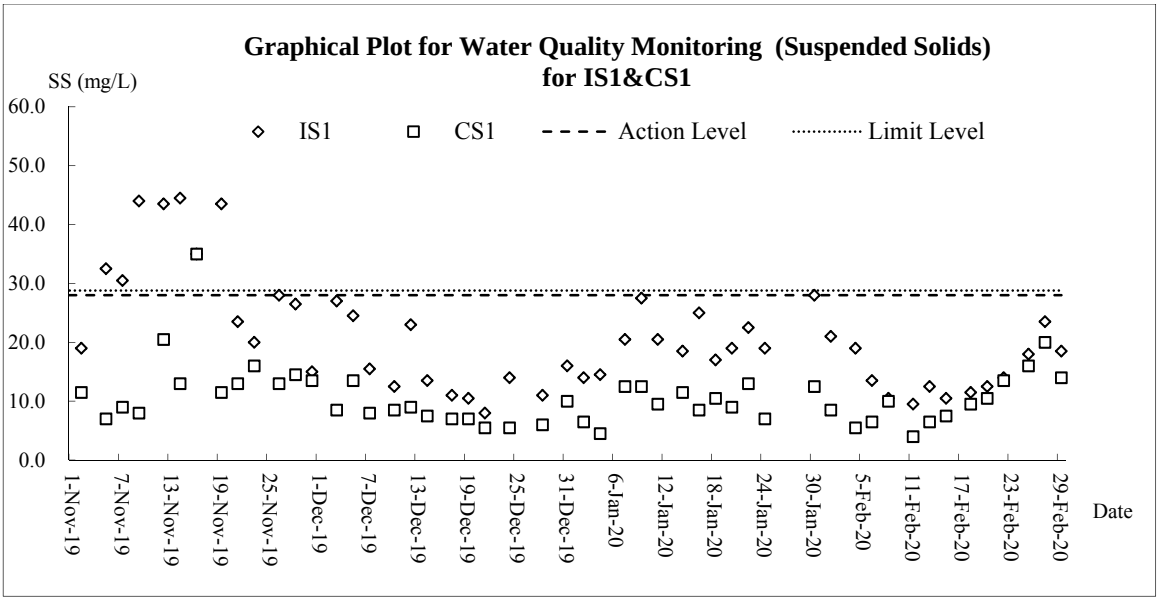

NMS-3 - Village house along Border Road
L_{eq30}, dB(A)
Limit Level
Corrected Leq 30min
85
80
75
70
65
60
55
50
45
40
Date
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

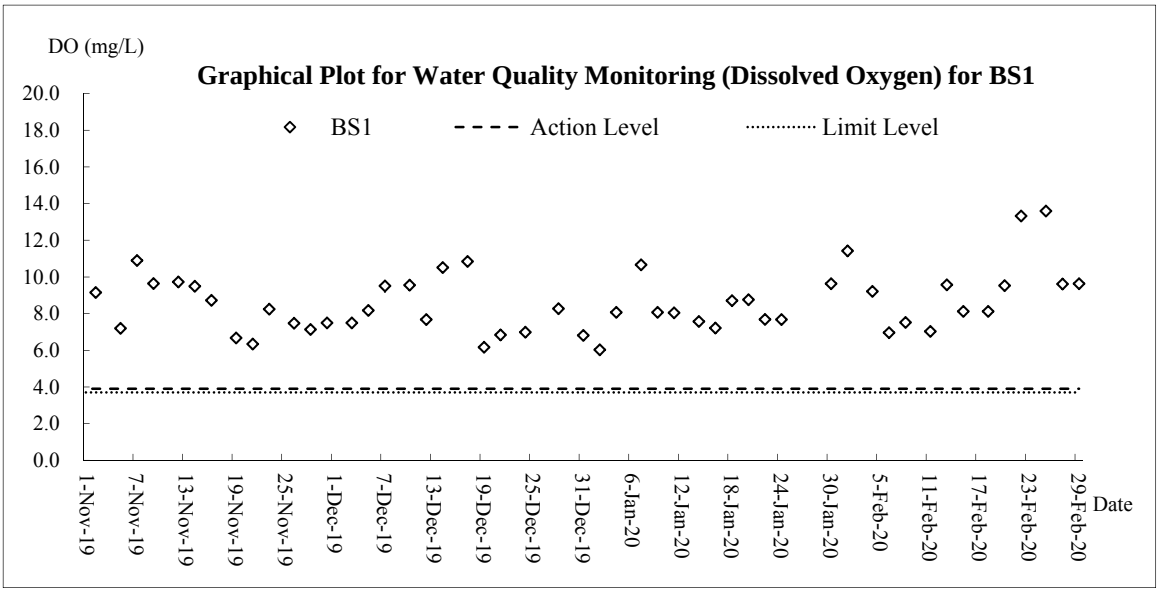

NMS-4A - Hong Kong Police Force, Lok Ma Chau Operation Base at Horn Hil
L_{eq30}, dB(A)
Corrected Leq 30min
Limit Level
85
80
75
70
65
60
55
50
45
40
Date
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20

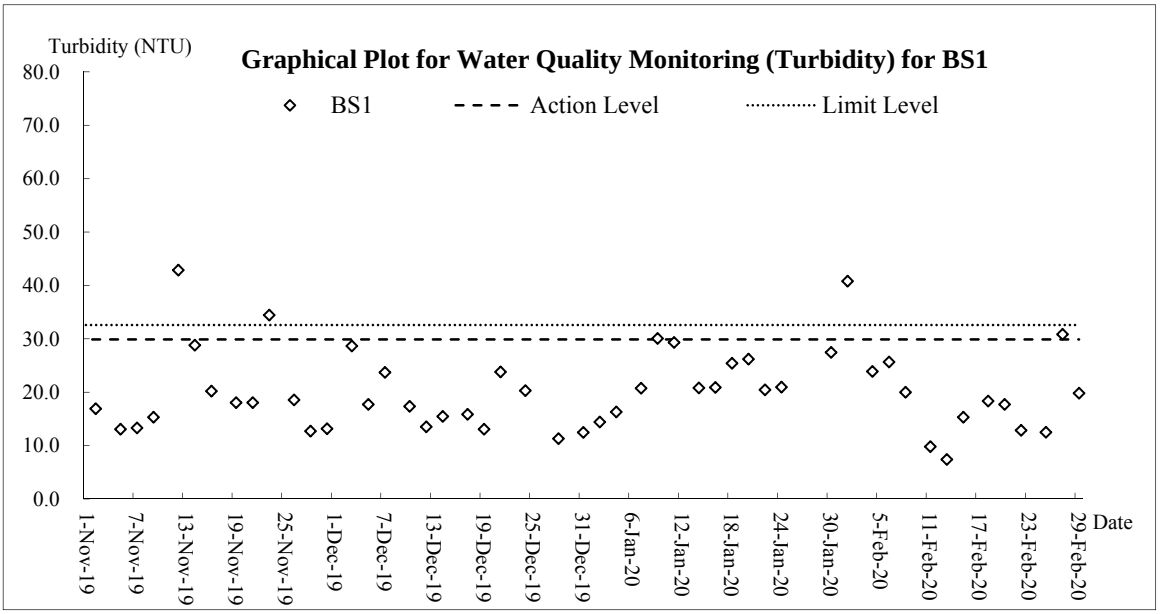
Water Quality

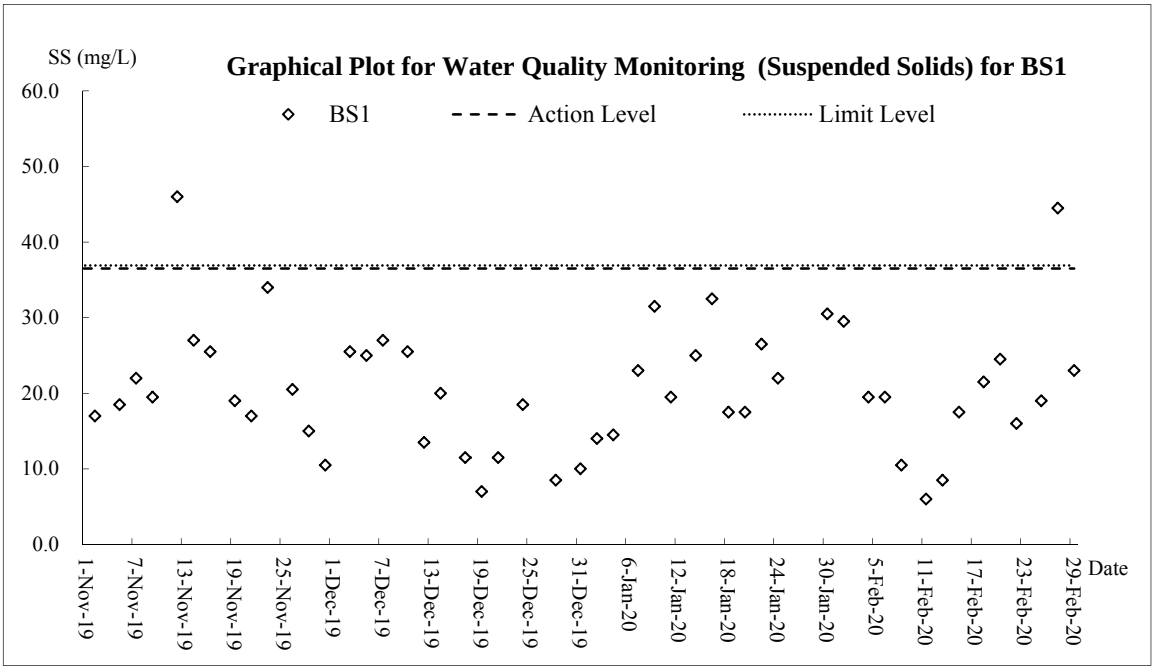


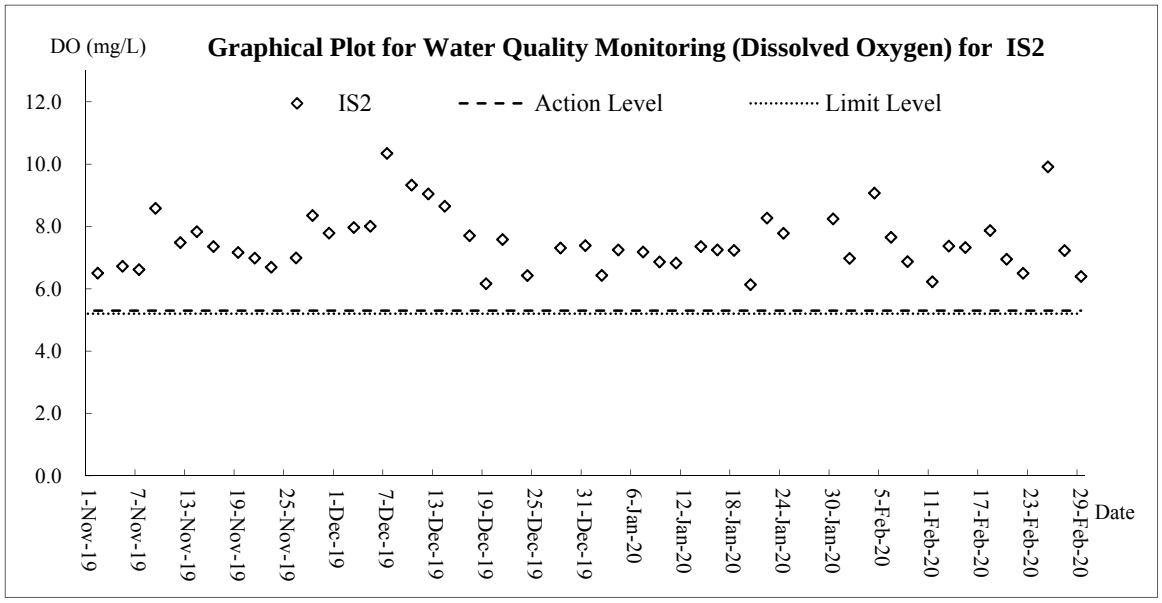


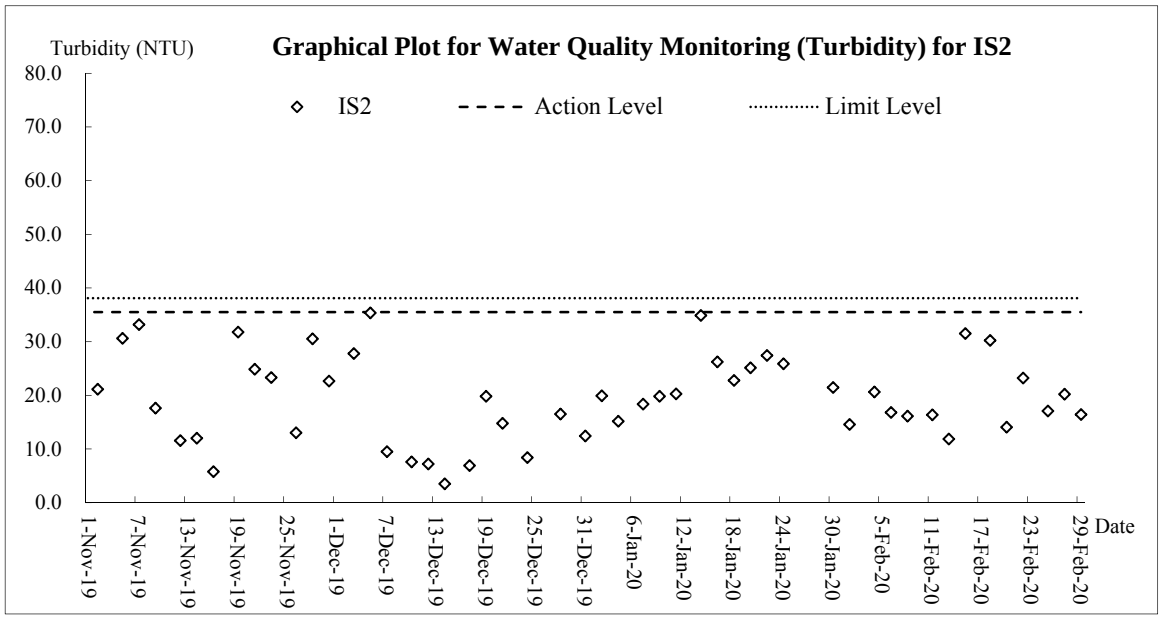


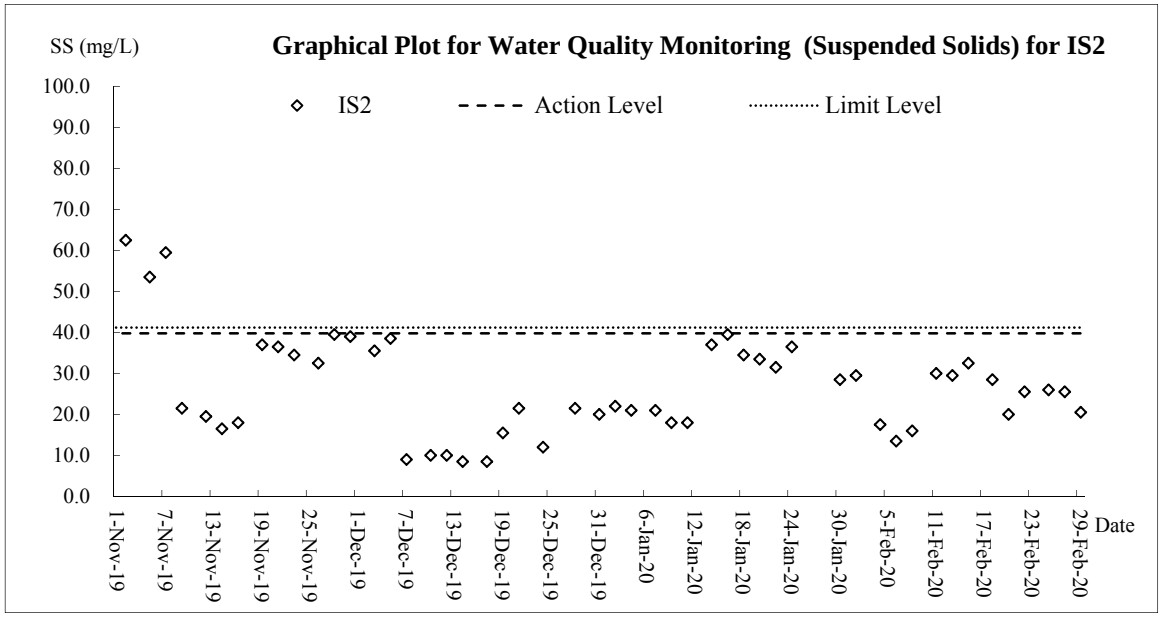

DO (mg/L)
Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) for BS1
BS1
Action Level
Limit Level
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

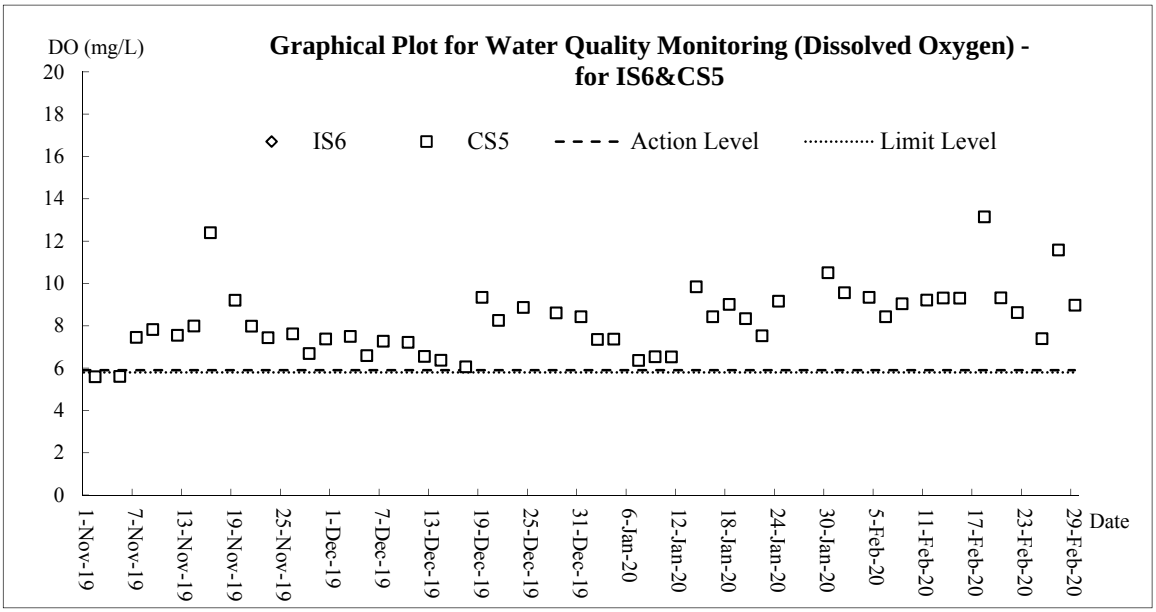

Turbidity (NTU)
Graphical Plot for Water Quality Monitoring (Turbidity) for BS1
BS1
Action Level
Limit Level
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

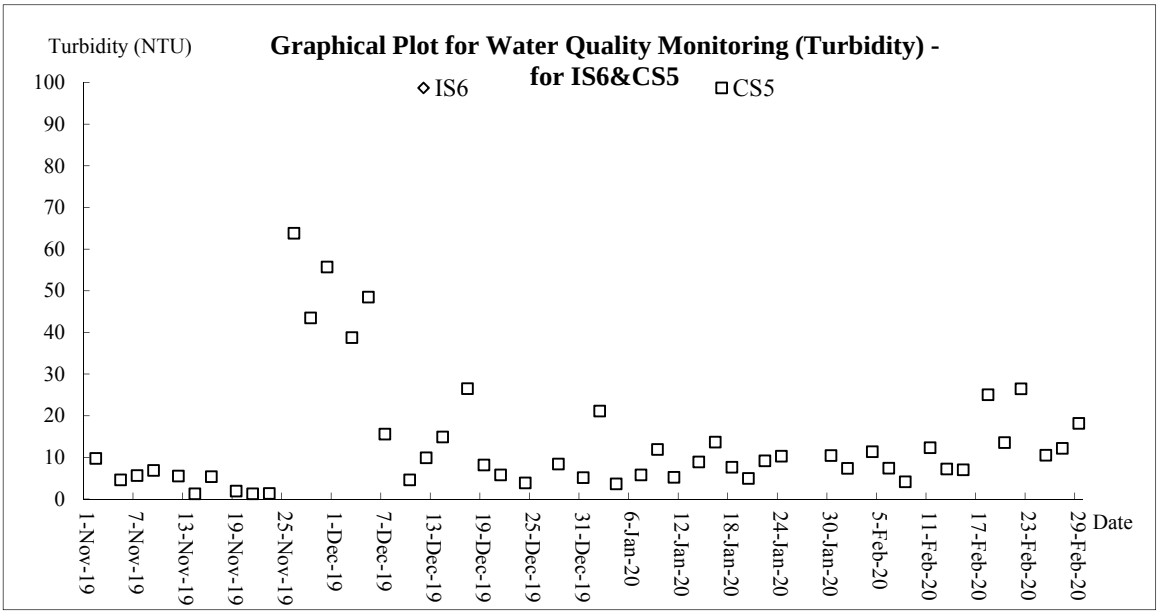

SS (mg/L)
Graphical Plot for Water Quality Monitoring (Suspended Solids) for BS1
BS1
Action Level
Limit Level
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

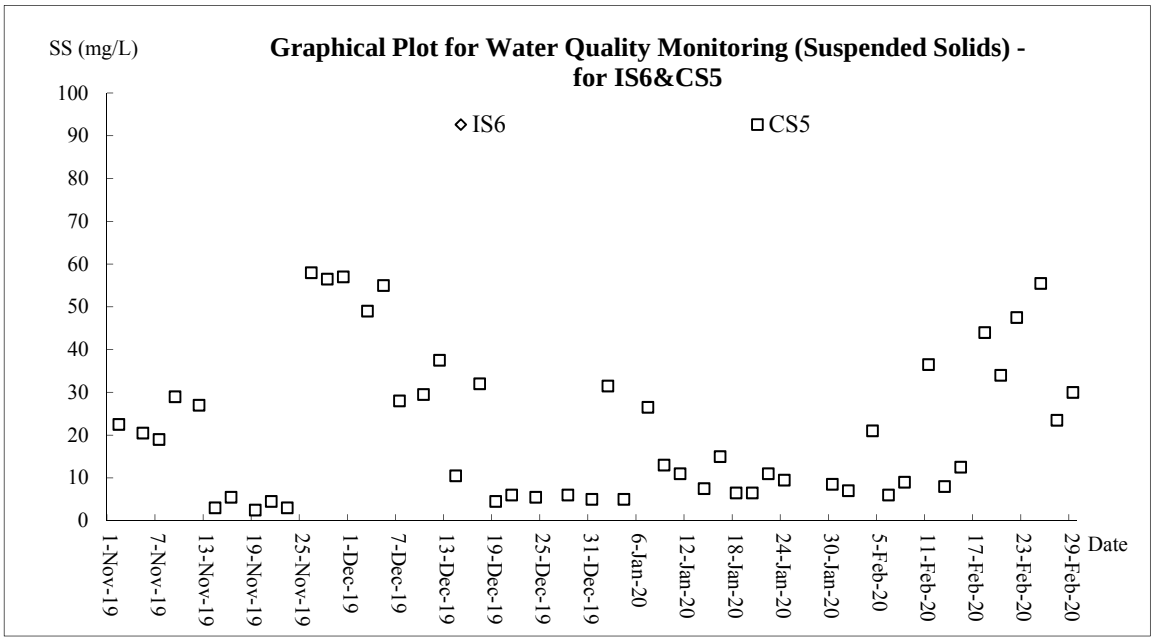

DO (mg/L)
Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) for IS2
IS2
Action Level
Limit Level
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

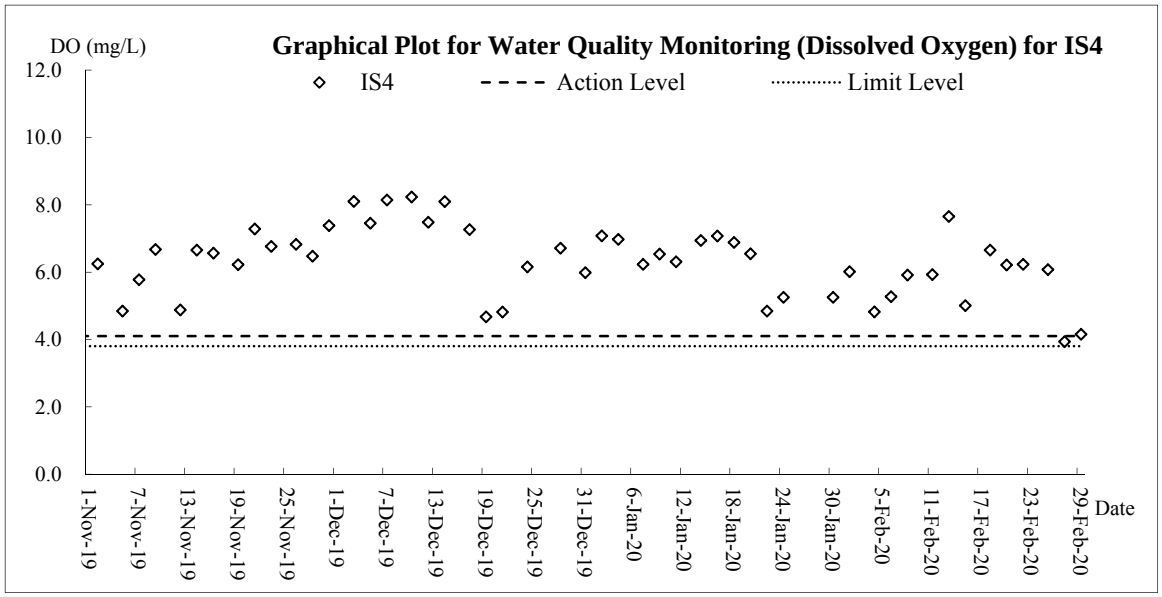

Turbidity (NTU)
Graphical Plot for Water Quality Monitoring (Turbidity) for IS2
IS2
Action Level
Limit Level
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

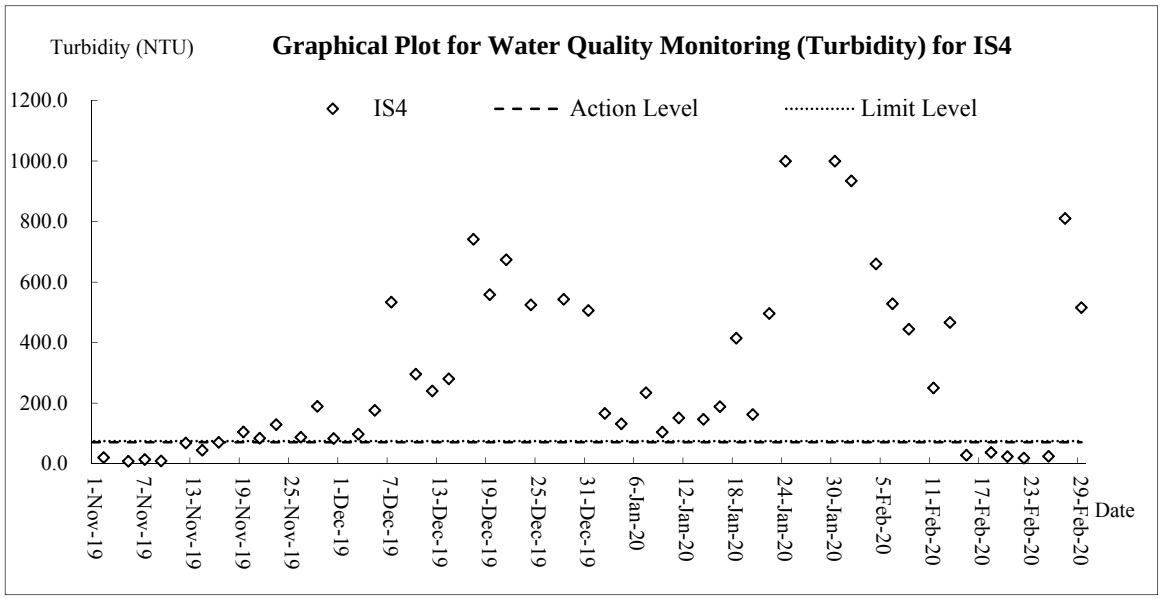

SS (mg/L)
Graphical Plot for Water Quality Monitoring (Suspended Solids) for IS2
IS2
Action Level
Limit Level
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

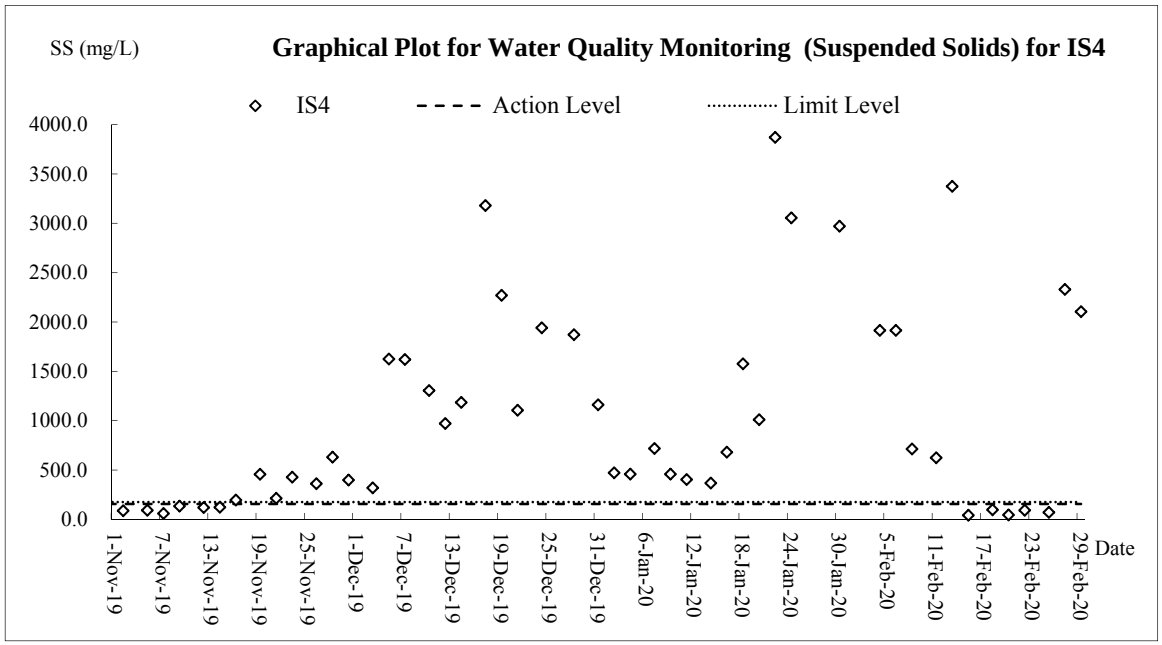

DO (mg/L)
Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - for IS6&CS5
IS6
CS5
Action Level
Limit Level
Date


Turbidity (NTU)
Graphical Plot for Water Quality Monitoring (Turbidity) - for IS6&CS5
IS6
CS5
Date


SS (mg/L)
Graphical Plot for Water Quality Monitoring (Suspended Solids) - for IS6&CS5
IS6
CS5
Date


DO (mg/L)
Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) for IS4
IS4
Action Level
Limit Level
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date


Turbidity (NTU)
Graphical Plot for Water Quality Monitoring (Turbidity) for IS4
IS4
Action Level
Limit Level
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date


SS (mg/L)
Graphical Plot for Water Quality Monitoring (Suspended Solids) for IS4
IS4
Action Level
Limit Level
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
500.0
0.0
1-Nov-19
7-Nov-19
13-Nov-19
19-Nov-19
25-Nov-19
1-Dec-19
7-Dec-19
13-Dec-19
19-Dec-19
25-Dec-19
31-Dec-19
6-Jan-20
12-Jan-20
18-Jan-20
24-Jan-20
30-Jan-20
5-Feb-20
11-Feb-20
17-Feb-20
23-Feb-20
29-Feb-20
Date

Appendix J

Meteorological Data

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station	
				Mean Air Temp. (°C)	Mean Relative Humidity (%)
1-Feb-20	Sat	Mainly cloudy. Bright periods in the afternoon.	0	13.1	69
2-Feb-20	Sun	One or two light rain patches tonight.	0	17.5	72.5
3-Feb-20	Mon	Moderate to fresh easterly winds, occasionally strong offshore.	Trace	18.5	74.5
4-Feb-20	Tue	Mainly cloudy with light rain.	0.8	16.2	85
5-Feb-20	Wed	Moderate southeasterly winds.	1	17.1	83
6-Feb-20	Thu	Mainly cloudy with light rain.	Trace	17.4	72.2
7-Feb-20	Fri	Fresh easterly winds, strong offshore at first	0	17.7	79.7
8-Feb-20	Sat	One or two light rain patches tonight.	0	15.6	68.0
9-Feb-20	Sun	Mainly cloudy. Bright periods in the afternoon.	Trace	16.1	65.0
10-Feb-20	Mon	Light winds, moderate south to southeasterly winds	0	16.3	73.5
11-Feb-20	Tue	Showers will be heavier with a few squally thunderstorms during.	0.8	18.5	81
12-Feb-20	Wed	Becoming cloudy with a few showers and fog patches.	0	22.6	79
13-Feb-20	Thu	Mainly cloudy with a few showers.	41.6	18.9	90.7
14-Feb-20	Fri	Moderate to fresh northerly winds	9.7	22.5	83.5
15-Feb-20	Sat	Cold in the morning.	Trace	21.7	75
16-Feb-20	Sun	Moderate to fresh northerly winds	25.5	15.3	66.2
17-Feb-20	Mon	Fine and very dry	0	12.7	44.7
18-Feb-20	Tue	Light winds, moderate south to southeasterly winds	0	12.6	57
19-Feb-20	Wed	Showers will be heavier with a few squally thunderstorms during.	0	15.1	64.5
20-Feb-20	Thu	Becoming cloudy with a few showers and fog patches.	0	16.7	69.5
21-Feb-20	Fri	Mainly cloudy with a few showers.	0	19.3	67.5
22-Feb-20	Sat	Moderate to fresh northerly winds	0	19.4	60
23-Feb-20	Sun	Moderate to fresh northerly winds	0	21.6	60
24-Feb-20	Mon	Fine and very dry	0	20.4	71.5
25-Feb-20	Tue	Cold in the morning.	Trace	22.9	76.2
26-Feb-20	Wed	Fine and very dry	0	23.4	74.2
27-Feb-20	Thu	Mainly cloudy. One or two rain patches tonight.	0.4	21.4	77.5
28-Feb-20	Fri	Mainly cloudy with light rain.	0	21.9	72.2
29-Feb-20	Sat	Moderate to fresh easterly winds.	0	22.4	71

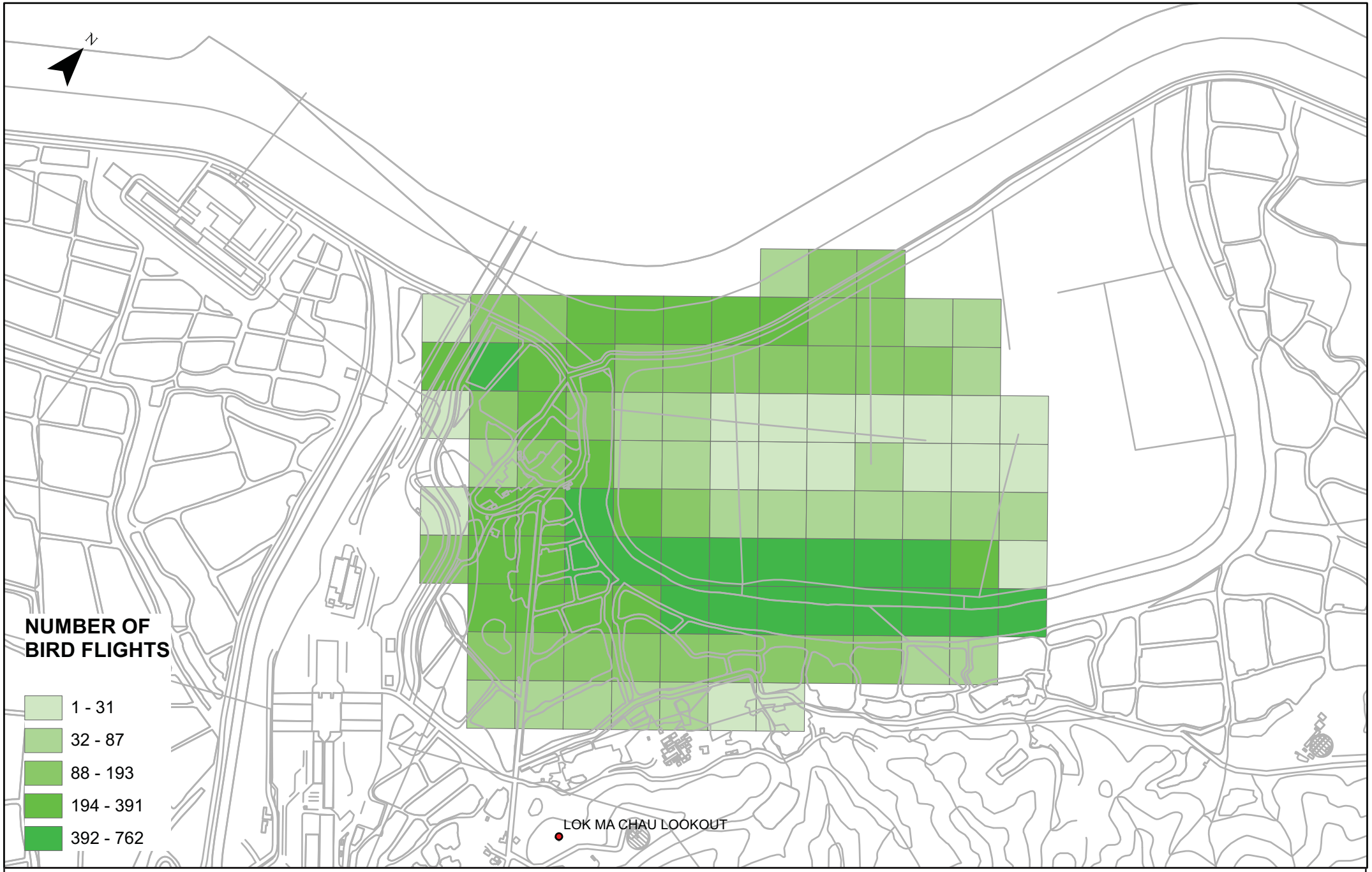
Date	Wind Speed & Direction data measuring records in the Reporting Month												
1-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.6	0.2	0.1	0.7	0.5	0.4	0.7	0.3	0.1	0.1	0.8	0.4
	Direction (Deg.)	234	265	228	274	238	16	19	34	255	267	213	282
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.6	0.4	1.0	1.1	0.9	0.7	0.8	0.2	0.1	0.2	0.3	0.3
	Direction (Deg.)	311	10	13	5	2	19	33	338	319	328	11	18
2-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.8	0.4	0.3	0.5	0.3	0.4	0.6	0.5	0.6	1.0	0.7	1.1
	Direction (Deg.)	128	89	131	102	76	81	87	98	113	84	85	92
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.9	0.5	0.6	0.8	0.4	0.7	0.3	0.2	0.4	0.3	0.5	0.4
	Direction (Deg.)	95	137	98	76	95	118	136	74	109	134	124	116
3-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.4	0.3	0.4	0.2	0.3	0.4	0.8	0.7	0.8	1.1	0.8	0.6
	Direction (Deg.)	121	128	137	76	84	92	134	89	121	67	98	113
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.7	1.3	0.5	1.7	0.6	1.1	0.3	0.1	0.3	0.5	0.6	0.4
	Direction (Deg.)	61	89	93	87	97	84	134	67	128	133	118	125
4-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.1	0.4	0.1	0.5	0.4	0.6	0.1	0.0	0.0	0.1	0.0	0.5
	Direction (Deg.)	97	95	69	295	344	356	273	128	169	119	136	55
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.6	0.8	0.6	0.1	0.5	0.1	0.1	0.0	0.0	0.1	0.0
	Direction (Deg.)	26	87	101	318	310	28	92	97	128	103	78	106
5-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.0	0.1	0.4	0.5	0.0	0.2	0.6	0.1	0.0	0.6	0.8	1.0
	Direction (Deg.)	318	68	85	33	49	333	346	357	59	103	74	46
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.8	0.8	0.2	0.7	0.6	0.6	0.1	0.6	0.4	0.6	1.0
	Direction (Deg.)	95	86	92	143	68	96	13	27	33	306	29	46
6-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	1.2	1.7	1.6	0.8	0.9	0.8	1.0	0.8	1.3	1.2	1.0	1.2
	Direction (Deg.)	89	128	87	76	118	107	129	103	98	128	131	94
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.9	0.7	0.7	0.6	0.5	0.8	0.1	0.3	0.6	0.9	0.5	0.4
	Direction (Deg.)	91	86	55	78	93	96	91	89	123	84	113	93
7-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.8	0.9	0.6	0.6	0.4	0.3	0.1	0.0	0.0	0.4	0.6	0.1
	Direction (Deg.)	122	93	103	91	78	128	335	317	46	97	73	46
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.7	0.5	0.3	0.6	0.6	0.4	0.3	0.1	0.4	0.3	0.1	0.1
	Direction (Deg.)	11	89	7	34	86	26	121	98	115	99	137	131
8-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.5	0.4	0.4	0.6	0.2	0.1	0.2	0.6	0.5	0.4	0.7
	Direction (Deg.)	13	25	16	21	346	324	12	19	34	26	24	326
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.9	0.8	1.0	1.1	1.0	0.4	0.1	0.6	0.3	0.1	0.4	0.1
	Direction (Deg.)	9	28	17	6	319	87	46	16	11	18	18	13
9-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.1	0.4	0.2	0.2	0.6	0.4	0.8	0.7	0.3	0.5	1.1	0.8
	Direction (Deg.)	7	12	18	15	47	23	11	98	341	9	316	347
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.5	0.4	0.5	0.6	0.4	0.4	0.0	0.3	0.4	0.4	0.1
	Direction (Deg.)	15	331	325	339	311	13	87	76	46	93	87	81
10-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.0	0.6	0.4	0.0	0.2	0.0	0.0	0.1	0.1	0.4	0.5	0.1
	Direction (Deg.)	318	13	26	38	49	9	7	11	338	329	317	78
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.6	0.7	0.4	0.1	0.0	0.2	0.3	0.0	0.0	0.0	0.1	0.3
	Direction (Deg.)	90	17	19	14	319	324	87	179	15	21	10	76
11-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.0	0.1	0.5	0.4	0.7	0.2	0.0	0.0	0.0	0.4	0.5	0.8
	Direction (Deg.)	16	87	93	106	137	84	316	337	302	128	143	86
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.9	1.2	1.6	0.8	0.8	0.9	0.9	0.4	0.6	0.6	1.2	0.8
	Direction (Deg.)	79	91	98	124	119	127	97	121	139	92	118	87

Date	Wind Speed & Direction data measuring records in the Reporting Month												
12-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.6	0.4	0.3	0.5	0.1	0.0	0.4	0.7	0.0	0.1	0.0	0.0
	Direction (Deg.)	89	137	92	116	227	98	129	142	323	330	319	338
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.0	0.6	0.5	1.2	0.8	0.7	0.2	0.1	0.4	0.1	0.8	0.2
	Direction (Deg.)	171	62	83	76	131	86	268	193	84	146	103	79
13-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.1	0.1	0.5	0.1	0.3	0.5	0.0	0.4	0.1	0.3	0.1
	Direction (Deg.)	92	137	176	169	43	49	98	238	284	353	349	335
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.5	0.6	0.2	0.4	0.2	0.7	0.8	0.2	0.4	0.7	1.0
	Direction (Deg.)	8	83	21	352	6	8	24	28	8	19	24	29
14-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.5	0.3	0.8	0.4	0.5	0.4	0.2	0.7	0.5	0.6	0.3	0.4
	Direction (Deg.)	14	13	28	31	17	344	4	40	1	26	358	0
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.4	0.5	0.7	0.5	0.3	0.3	0.5	0.5	0.3	0.7	0.4	0.4
	Direction (Deg.)	17	84	20	8	14	12	24	23	12	13	14	345
15-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	1.0	0.6	0.8	0.6	0.4	0.3	0.4	0.3	0.3	0.9	0.5
	Direction (Deg.)	7	27	13	40	40	22	3	13	340	360	18	355
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.6	0.5	0.8	0.7	0.7	0.3	0.2	0.2	0.3	0.2	0.2	0.1
	Direction (Deg.)	28	86	32	52	28	29	325	17	29	11	1	293
16-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.2	0.2	2.0	0.3	0.4	0.2	0.3	0.3	0.7	0.3	0.6	0.6
	Direction (Deg.)	285	326	316	290	265	331	280	276	254	278	260	260
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.4	0.5	0.3	0.3	0.3	0.2	0.2	0.5	0.2	0.5	0.5	0.7
	Direction (Deg.)	304	88	333	318	326	288	286	265	288	299	281	263
17-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.4	0.6	0.4	0.3	0.3	0.3	0.6	0.7	0.4	0.6	0.9	0.5
	Direction (Deg.)	296	267	333	331	275	284	277	272	305	298	268	283
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.5	0.5	0.3	0.6	0.4	0.3	0.2	0.4	0.3	0.2	0.2	0.3
	Direction (Deg.)	278	86	320	4	338	308	289	255	308	10	290	263
18-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.2
	Direction (Deg.)	294	301	293	285	277	273	276	320	351	282	257	302
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.5	0.8	0.5	0.3	0.1	0.2	0.3	0.1	0.2	0.5	0.4
	Direction (Deg.)	337	84	21	19	7	341	253	22	341	318	42	13
19-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.3	0.4	0.4	0.3	0.6	0.3	0.4	0.7	0.8	0.7	0.5
	Direction (Deg.)	349	8	32	21	18	32	28	42	29	26	15	21
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.1	0.5	0.8	0.5	0.1	0.8	0.6	0.9	0.8	0.9	0.7	0.2
	Direction (Deg.)	23	81	21	22	21	30	41	30	30	37	23	24
20-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.5	0.2	0.1	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.4
	Direction (Deg.)	13	347	321	9	20	30	17	13	266	14	270	264
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.2	0.5	0.8	0.1	0.1	0.1	0.3	0.9	0.1	0.6	0.5	0.4
	Direction (Deg.)	285	86	31	27	27	28	5	34	28	19	16	17
21-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.8	0.9	0.8	0.8	0.2	0.9	0.4	0.7	0.5	0.4	0.6	0.4
	Direction (Deg.)	24	27	36	27	352	30	16	35	24	20	14	1
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.7	1.0	0.5	0.7	0.7	0.5	0.3	0.2	0.5	0.1	0.1	0.3
	Direction (Deg.)	15	83	7	21	16	34	34	14	34	335	310	45
22-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.4	0.4	0.2	0.1	0.0	0.0	0.1	0.2	0.7	0.2	0.5	0.4
	Direction (Deg.)	35	12	325	247	277	288	358	241	234	40	269	270
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	1.1	0.6	0.9	0.8	0.9	0.8	0.7	0.9	0.4	0.5	0.9
	Direction (Deg.)	296	87	11	22	17	30	14	359	30	291	344	1
23-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**

Date	Wind Speed & Direction data measuring records in the Reporting Month												
	Speed (m/s)	0.4	0.5	1.2	1.1	0.7	0.8	1.0	1.0	1.7	1.1	1.1	0.9
	Direction (Deg.)	307	333	12	17	24	18	24	25	27	22	13	359
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.8	1.1	0.8	1.0	0.6	0.8	0.3	0.9	0.8	0.6	0.5	0.4
	Direction (Deg.)	10	82	13	26	15	29	349	20	29	4	338	345
24-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.4	0.3	0.2	0.3	0.2	0.4	0.7	1.0	0.7	0.5	0.8
	Direction (Deg.)	26	12	332	4	333	330	260	26	22	355	272	12
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.5	1.1	0.9	12.0	0.7	0.3	0.2	0.4	0.3	0.2	0.1	0.1
	Direction (Deg.)	335	82	15	11	12	353	337	1	353	239	304	280
25-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.1	0.1	0.1	0.0	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4
	Direction (Deg.)	313	333	257	236	337	344	8	23	13	23	20	269
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	1.0	0.3	0.7	0.3	0.3	0.3	0.2	0.3	0.5	0.6	0.6
	Direction (Deg.)	281	87	336	12	336	15	6	4	15	18	18	26
26-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.4	0.4	0.4	0.1	0.3	0.2	0.3	0.3	0.8	0.3	0.5	0.6
	Direction (Deg.)	22	6	9	354	27	16	350	14	24	309	266	260
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.8	1.1	1.2	1.1	0.1	0.5	0.3	0.1	0.5	0.3	0.2
	Direction (Deg.)	321	91	242	236	247	247	242	238	247	20	244	290
27-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.3	0.2	0.2	0.2	0.5	0.6	1.5	1.1	1.1	1.5	1.5	1.1
	Direction (Deg.)	247	243	246	282	14	356	14	10	26	18	9	9
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.9	1.5	0.5	0.7	1.0	0.9	0.7	0.5	0.9	0.4	0.7	0.6
	Direction (Deg.)	14	80	328	357	4	17	5	330	17	313	351	344
28-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**0:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	1.4	1.5	0.6	0.4	0.3	0.4	0.4	0.4	0.7	0.6	0.9	0.6
	Direction (Deg.)	5	14	357	18	313	279	285	259	8	6	13	5
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.3	0.5	0.3	0.4	0.3	0.4	0.4	0.2	0.4	0.3	0.6	0.4
	Direction (Deg.)	352	86	311	1	336	268	251	19	268	15	31	355
29-Feb-20	**Time**	**0:00**	**1:00**	**2:00**	**3:00**	**4:00**	**5:00**	**6:00**	**7:00**	**8:00**	**9:00**	**10:00**	**11:00**
	Speed (m/s)	0.2	0.5	0.2	0.3	0.1	0.3	0.1	0.1	0.4	2.0	0.4	0.3
	Direction (Deg.)	340	20	9	2	218	47	326	347	14	336	345	328
	Time	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**
	Speed (m/s)	0.5	0.7	1.0	1.2	0.3	0.6	0.8	0.4	0.2	0.1	0.1	0.4
	Direction (Deg.)	339	312	306	15	10	289	23	331	13	11	26	315

Appendix K

Distribution of Flight Line Usage



DEVELOPMENT OF LOK MA CHAU LOOP:
LAND DECONTAMINATION AND ADVANCE ENGINEERING WORKS – DESIGN AND CONSTRUCTION
DISTRIBUTION OF BIRD FLIGHT LINE IN THE MONITORING MONTH (FEBRUARY 2020)

Appendix L

Photo Records for Mammal Monitoring

Photo of the animal captured by the remote-sensing (infra-red flash) cameras – February 2020

Location B

Appendix M

Waste Flow Table

生興 – 豐利聯營
Sang Hing – Kuly Joint Venture

Monthly Summary Waste Flow Table for 2020

Contract No.: YL/2017/03

Month in Year 2020	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Borken Concrete	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics (See note 3)	Chemical Waste	Other, e.g. general refuse
	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m^3]
Jan	0.0	0.0	0.0	0.0	0.0	28.7	0.0	0 (*)	0 (*)	0.0	0.04
Feb	0.0	0.0	0.0	0.0	0.0	18.8	0.0	0 (*)	0 (*)	0.0	0.05
Mar											
Apr											
May											
Jun											
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
TOTAL	0.0	0.0	0.0	0.0	0.0	47.5	0.0	0 (*)	0 (*)	0.00	0.09

Note: (1) Conversion to 1000m^3 for general refuse is number of truck dumped multiply by 13.5 m3 (volumn of rubbish skip on site)
(2) Conversion to 1000m^3 for Inert C&D is weight in 1000kg multiply by 0.0005
(3) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material
(*) Represents the waste generated is negligible

Year 2019 (Jan - Dec)	Actual Quantities of Inert C&D Materials Generated						Actual Quantities of C&D Wastes Generated				
	Total Quantity Generated	Hard Rock and Large Borken	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Imported Fill	Metals	Paper / Cardboard	Plastics (See note 3)	Chemical Waste	Other, e.g. general refuse
	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m^3]
TOTAL	0.0	0.0	149.0	0.0	0.0	100.5	0.0	0 (*)	0 (*)	0.13	1.49

Refer to Notes above.

Appendix N

Environmental Complaints Log

Environmental Complaints Log

Log ref.	Date of complaint	Complaint route	Reference no.	Complaint nature	Investigation fining	Status
1	9-Sep-19	EPD	EPD Ref: 25222-19	Water quality and air quality	Non-project related	Interim report was submitted to EPD on 23 Sep 2019
2	11-Oct-19	EPD	EPD Ref: 28550-19	Air quality	Non-project related	Interim report was submitted to EPD on 6 Nov 2019
3	30-Oct-19	EPD	EPD Ref: 30478-19	Air quality	Non-project related	Interim report was submitted to EPD 14 Nov 2019
4	10-Dec-19	1823 (CEDD)	1823 Case no: 2-6145710343	Noise and air quality	Non-project related	Final reply to 1823 on 24 Dec 2019. IR prepared by Contractor was agreed by IEC and ET

Appendix N

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
Construction Dust Impact							
S3.8	D1-DP1/DP2	Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road is proposed to achieve dust removal efficiency of 92.1%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.6 L/m2 to achieve the respective dust removal efficiencies	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	^
S3.8	D2-DP1/DP2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation • All vehicles shall be shut down in intermittent use • Only well-maintained plant should be operated on-site to avoid emission of dark smoke • Valid Non-Road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	^ ^ *
S3.8	D2-DP1/DP2	• Following dust suppression measures should also be incorporated by the Contractor to control the dust nuisance throughout the construction Phase • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty material do not leak from the vehicle;	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period. • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;					^ ^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.					^ ^ ^
S3.8	D4-DP1/DP2	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction stage	^
Construction Noise Impact							
S4.8	N-CP1-DP1/DP2	Implement the following good site management practices: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • Mobile plant should be sited as far away from NSRs as possible and practicable;	Control construction airborne noise	Contractor	All construction sites	Construction stage	^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.					^
S4.8	N-CP2-DP1/DP2	Install temporary site hoarding (approx 2.4m high) located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites where practicable	Construction phase	^
S4.8	N-CP3-DP1/DP2	Install movable noise barriers and full enclosure, screen the noisy plants including air compressor and generator.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction phase	^
S4.8	N-CP4-DP1/DP2	Use of “Quiet” Plant and Working Methods	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction phase	^
S4.8	N-CP5-DP1/DP2	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction phase	^
S4.8	N-CP6-DP2	Setting the concrete lorry mixer at around 25m away from the existing NSRs along Ha Wan Tsuen Road and Lok Ma Chau Road	Reduce the noise levels from concrete lorry mixer	Contractor	Sections with NSRs along Ha Wan Tsuen Road and Lok Ma Chau Road	Construction phase	^
S4.8	N-CP8-DP2	Provide temporary noise barrier during construction phase.	Control airborne noise from construction access road traffic	Contractor	Refer to Figure 4-8 of the EIA report	Construction phase	*

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
S4.8	N-CP7-DP2/N-CP6-DP1	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction phase	^
Water Quality Impact (Construction Phase)							
S5.7	W1-CP-DP1/DP2	Construction Runoff and Site Drainage In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94), construction phase mitigation measures, where appropriate, should include the following: • Update and implementation of Stormwater Pollution Control Plan • 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 (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipments in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities,	Minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction phase	^ * ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped. • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates. • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction. • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means. • 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 following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas.					^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • All open stockpiles of construction materials (for example, aggregates, sand and fill material) of 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. • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Precautions to be taken at any time of year when rainstorms are likely, actions to 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 PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events. • 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 facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of					^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheelwash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. • Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the meander, wetlands and fish ponds.		*			^ ^ ^ ^
S5.7	W3-CP-DP1/DP2	<u>*Groundwater from Contaminated Area*</u> • No mitigation measure is required for groundwater treatment in LMC Loop. • Additional investigation is required to identify if contaminated groundwater is found	Minimize groundwater quality impact from contaminated area	Contractor	Areas where contamination is found.	Construction phase	^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• If the investigation results indicated that the groundwater to be generated from construction works would be contaminated, the contaminated groundwater should be either discharged into recharged wells, or properly treated in compliance with the requirements of Technical Memorandum on Standards for Effluents Discharged into Drainage on Sewerage Systems, Inland and Coastal Waters. • If recharged well method were used, the groundwater quality in the recharged well should not be affected by recharging operation, i.e. the pollution levels of the recharged groundwater should not be higher than that in the recharging wells. • If treatment and discharge method were used, the design of wastewater treatment facilities, such as active carbon and petrol interceptor, should be submitted to the EPD and a discharge license should be obtained under the WPCO through the Regional Offices of EPD.					^ ^ ^
S5.7	W3-CP-DP1/DP2	*Sewage from Workforce* • Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets to cater 0.15m3/day/employed populations and be responsible for appropriate disposal and maintenance. • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on the construction site should be conducted in order to provide an effective control of any	Minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction phase	^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		malpractices and achieve continual improvement of environmental performance on site.					
S5.7	W4-CP-DP1	*Riverbanks Formation* • In order to prevent sediment transport during riverbank works, deployment of silt curtain should be implemented, especially when construction works encroach or occur in close distance to water body. It is recommended to carry out all the riverbank works within a cofferdam or diaphragm wall. • Water quality of the Shenzhen River and the meander would be monitored to ensure effectiveness of the implemented mitigation measures.	Minimize water quality impact from riverbank works	Contractor	Riverbank works	Construction Phase	^ ^
S5.7	W1-CP-BR	*Bio-remediation in Shenzhen River* • Water quality monitoring and audit is recommended to ensure that the proposed bio-remediation operation would not result in adverse water quality impact. Details of the water quality monitoring programme are presented in the EM&A Manual. If unacceptable water quality impact in the receiving water is recorded, additional measures such as slowing down, or rescheduling of works should be implemented as necessary.	Minimize water quality impact from bio-remediation of Shenzhen River	Contractor	Shenzhen River where practicable	Construction phase	^
S5.7	W5-CP-DP2	*Construction of Bridge Crossing* • Good site management as stipulated in ProPECC PN1/94 should be fully implemented to avoid polluted liquid or solid wastes from falling into the WSRs. • All the fishponds will be drained and no fishpond will be affected by bridge crossing.	Minimize water quality impact from construction of bridge crossing	Contractor	Construction sites for bridge crossing where practicable	Construction phase	^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• In the meander, cofferdam or diaphragm walls should be deployed for protecting fish ponds or nearby rivers during bridge pier construction and or road widening work at fishponds. • For the low level viaducts crossing the small streams at Ma Tso Lung, Ping Hang and channel near Lung Hau Road, precast structures will be used such that there will be no construction work in the water streams, and thus, to avoid direct water quality impacts.					^ ^
Waste Management (Construction Waste)							
S7.6	WM1-DP1/DP2	*Waste Reduction Measures* Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction: • Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate	Reduce waste generation	Contractor	All construction sites where practicable	Construction phase	^ ^ ^ ^ N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		waste management procedures, including waste reduction, reuse and recycling.					
S7.6	WM2-DP1/DP2	Prepare Waste Management Plan and submit to the Engineer for approval	Minimize waste generation during construction	Contractor	All construction sites	Construction phase	N/A
S7.6	WM2-DP1/DP2	*Good Site Practice* The following good site practices are recommended throughout the construction activities: • Nomination of an approved personnel, such as a site manager, to be responsible for the implementation of 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 site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • Provision of sufficient waste disposal points and regular collection for disposal; • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;	Minimize waste generation during construction	Contractor	All construction sites	Construction phase	^ ^ ^ ^ ^
S7.6	WM4-DP1/DP2	*Storage of Waste* The following recommendation should be implemented to minimize the impacts:	Minimize waste generation during construction	Contractor	All construction sites	Construction phase	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Waste such as soil should be handled and stored well to ensure secure containment; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; • Different locations should be designated to stockpile each material to enhance reuse;					^ ^ ^
S7.6	WM5-DP1/DP2	*Collection and Transportation of Waste* The following recommendation should be implemented to minimize the impacts: • Remove waste in timely manner; • Employ the trucks with cover or enclosed containers for waste transportation; • Obtain relevant waste disposal permits from the appropriate authorities; and • Disposal of waste should be done at licensed waste disposal facilities.	Minimize waste impact from storage	Contractor	All construction sites	Construction phase	^ ^ ^ ^
S7.6	WM6-DP1/DP2	*Excavated and C&D Material* Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at Public Fill Reception Facilities areas or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials: • Maintain temporary stockpiles and reuse excavated fill material for backfilling; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote	Minimize waste impacts from excavated and C&D material	Contractor	All construction sites	Construction phase	^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		the use of recycled aggregates where appropriate; and • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified. The recommended C&D materials handling should include: • On-site Sorting of C&D Materials • Reuse of C&D Materials • Use of Standard Formwork and Planning of Construction Materials Purchasing • Provision of Wheel Wash Facilities Details refer to Section 7.6.1.4 of the EIA report.					^ ^ ^ ^ ^
S7.6	WM7-DP1/DP2	*Contaminated Soil* As a precaution, it is recommended that standard good site practice should be implemented during the construction phase to minimize any potential exposure to contaminated soils or groundwater. The details of mitigation measures to minimize the potential environmental implications arising from the handling of contaminated materials refer to Land Contamination Section.	Remediate contaminated soil	Contractor	All construction sites where applicable	Construction phase	N/A
S7.6	WM8-DP1/DP2	*Chemical Waste* • If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	All construction sites	Construction phase	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		accordance with the Waste Disposal (Chemical Waste) (General) Regulation.					
S7.6	WM9-DP1/DP2	*General Waste* • General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction phase	^ ^ ^
S7.6	WM10-DP1/DP2	*Sewage* • The WMP should document the locations and number of portable chemical toilets depending on the number of workers, land availability, site condition and activities. • Regularly collection by licensed collectors should be arranged to minimize potential environmental impacts.	Minimize production of sewage impacts	Contractor	All construction sites	Construction phase	^ ^
S7.6	WM11-DP2	*Sediment* The following mitigation measures are recommended during transportation and stockpiling: • stockpiling area(s) must be properly designed and closed to the dredging locations as far as possible; • Stockpiling area(s) should be lined with impermeable sheeting and bunded; • stockpiles should be properly covered by impermeable sheeting;	Minimize waste impacts from sediment	Contractor	All construction sites	Construction phase	^ ^ *

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• vehicles delivering the sediments should be covered, and truck bodies and tailgates should be sealed to prevent any discharge during transportation; • bulk earth moving equipments should be utilized as much as possible to minimize workers' handling and contact of the excavated materials; and • personal protective clothing should be provided to site workers. In case contamination of excavated materials is confirmed after testing, the mitigation measures described in Land Contamination Impacts section should also be implemented to minimize potential environmental impacts.					^ ^ ^
Land Contamination							
S8.7	LC1-DP2	*<u>Remediation of arsenic-contaminated soil</u>* • "Solidification/Stabilization" (S/S) treatment method was proposed for the remediation of arsenic-contaminated soil. Toxicity Characteristic Leaching Procedure (TCLP) test should be undertaken after S/S in order to ensure that the contaminant will not leach to the environment. Unconfined Compressive Strength (UCS) test should be conducted, and not less than 1MPa should be met prior to the backfilling or stockpiled for future reuse within the study area. Off-site disposal or reuse of the solidified material is not allowed.	To remediate arsenic-contaminated soil	Project Proponent/ Contractor	LMC Loop, contaminated area	Prior to commencement of construction works within the contaminated area	^
S8.7	LC1-DP1/DP2	*<u>Excavation and Transportation</u>* • Excavation profiles must be properly designed and executed with • attention to the relevant requirements for environment, health and	To minimise the potential environmental impacts arising from the handling of	Contractor	Contaminated area		^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		safety; • In case the soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means; • Excavation should be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimise contaminated runoff; • Supply of suitable clean backfill material after excavation, if required; • Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent any discharge during transport or during wet season; • Speed control for the trucks carrying contaminated materials should be enforced; and • Vehicle wheel washing facilities at the site's exit points should be established and used.	contaminated materials				^ ^ ^ ^ ^ ^ ^
S8.7	LC3-DP1/DP2	*Solidification/Stabilization* • The loading, unloading, handling, transfer or storage of cement should be carried out in an enclosed system;	To minimize the potential environmental impacts arising from the handling of	Contractor	Contaminated area	The course of remediation	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Mixing process and other associated material handling activities should be properly scheduled to minimise potential noise impact and dust emission; • The mixing facilities should be sited as far apart as practicable from the nearby noise sensitive receivers; • Mixing of contaminated soil and cement / water / other additive(s) should be undertaken at a solidification plant to minimise the potential for leaching; • Runoff from the solidification / stabilization area should be prevented by constructing a concrete bund along the perimeter of the solidification / stabilization area; • The run-off contained in the concrete bund area along the perimeter of the paved solidification / stabilization area, if any, will be collected, stored and used for the mixing process of cement / contaminated soil; • If stockpile of treated soil is required, the stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or site run-off during rainy season; and • If necessary, there should be clear and separated areas for stockpiling of untreated and treated materials.	contaminated materials				^ ^ ^ ^ ^ ^ ^
Landscape and Visual Impact (Construction Phase)							
S11.5.4 Table11.5.	L-CP1-DP1	*Preservation and Protection of Existing Trees (Good Site Practice)*	Avoid disturbance and protection of existing trees	Detailed design consultant/	Within project site	Detailed design and construction	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
9		• The proposed works should avoid disturbance to the existing trees within and close to the works areas. The tree preservation proposals shall be coordinated with the layout and design of the engineering and architectural works at detailed design phase for further retention of individual trees. • It is recommended that a full detailed tree survey and felling application will be undertaken and submitted for approval by the relevant government departments in accordance with ETWB TCW No. 3/2006, 'Tree Preservation'. This will be conducted during the detailed design phase of the project and submitted to DLO for approval. The methodology and scope including the programme for the tree survey and felling application are also subject to the approval of the relevant authorities. • Trees which are not in conflict with the proposals would be retained and shall be protected by means of fencing during construction phase to prevent damage to tree canopies and root zones from vehicles and storage of materials. • Specifications for the protection of existing trees will be provided during the preparation of the detailed tree survey by Detailed Design consultants at detailed design and construction phase.		Contractor		phase	^ ^ ^ ^
S11.5.4 Table 11.5.9	L-CP2-DP1/DP2	*<u>Works Area and Temporary Works Areas (Good Site Practice)</u>* • The construction sequence and construction programme shall be optimized in order to minimize the duration of impact.	Minimize landscape impacts	Contractor	The whole project area where applicable	Construction phase	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Construction site controls shall be enforced including the storage of materials, the location and appearance of site accommodation and site storage; and the careful design of site lighting to prevent light spillage. • The temporary works areas shall be restored to its original condition or enhanced through the introduction of new amenity areas or planting areas following the completion of the construction phase.					^
	L-CP3-DP1/DP2	*Advance Implementation of Mitigation Planting* • Replanting of existing / disturbed vegetation shall be undertaken at the earliest possible stage of the construction phase of the project using predominantly native plant species although ornamental species may be used for roadside planting and amenity areas.	Minimize landscape impacts	Contractor	The whole project area where applicable	Construction phase	^
	L-CP4-DP1/DP2	*Transplantation of Existing Trees* • Some specimens have relatively higher amenity value which are in conflict with the proposals shall be considered for transplantation. For trees affected by the proposed infrastructure works the final receptor sites shall be preferably adjacent to their current locations alongside of the alignment to retain their contribution to the local landscape context. For the LMC Loop the receptor locations will be selected to allow the trees to be moved directly to their final locations in accordance with the detailed landscape proposals. • The transplanting proposals are subject to review at the	Minimize landscape impacts	Contractor	The whole project area where applicable	Construction phase	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		detailed design phase and to agreement-in-principle with the relevant management and maintenance agents and/or government departments. The implementation programme for the proposed works shall reserve sufficient time for the advanced tree transplanting preparation works to enhance the survival of the transplanted trees. • The transplanting proposals will be subject to the findings of the detailed tree survey and felling application to be undertaken by the detailed design consultants and following approval by the relevant departments.					
	L-CP6-DP1/DP2	*Creation of Wetland and Landscape Buffer* • The existing reedbed acquired for development areas for the project will be reinstated as part of the Ecological Area. The reinstatement shall be undertaken at the earliest possible stage during the construction phase of the project. • Creation of 12.78ha of Ecological Area (EA) containing reed marsh and marsh will be created at the southern portion of the LMC Loop, and a 50m width landscape buffer area will be set up in between the EA and the development area. Wetland creation concepts please refer to Figure 11.9zf and Chapter 12 Ecology Impact Assessment of this EIA. • Native tree and shrub mix will be utilised for the creation of landscape buffer along northern edge of EA to support the creation of avifauna habitat from ecologist perspectives as well as enhance the aesthetic and landscape diversity within	Compensation of the loss of landscape resources	Project Proponent/ Detailed design consultant/ Contractor/ Operator	The whole project area where applicable	Detailed design, construction and operational phases	^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		the LMC Loop Development. • Creation of minimum 11.72 Ha. of permanent compensatory off-site wetland areas at Sam Po Shue and Hoo Hok Wai. For the potential locations for off-site wetlands please refer to Figure 11.9zf and 11.9zh, Chapter 2 Project Description and Chapter 12 Ecology Impact Assessment of this EIA.					^
	V-CP5-DP1/DP2	*Coordination with Concurrent Projects* • Coordinated implementation programme with concurrent projects to minimise impacts and where possible reduce the period of disturbance.	Minimize landscape impacts	Contractor	The whole project area where applicable	Construction phase	N/A
Ecology (Construction Phase)							
S12.7	E1-DP1	*Disturbance to Fish Ponds at HHW* • Development set back a minimum of 23m from the edge Meander. • Management of fish pond habitat to enhance ecological value to twice existing value, in order to compensate for disturbance to large waterbirds. • Creation and establishment will occur prior to commencement of substantive works associated with any element of the project for which fish pond compensation is required. *Construction phase* • Erection of a 3m high, dull green site boundary fence to minimise disturbance to wetland habitats caused by human activity in LMC Loop.	On the disturbance to fish ponds at HHW	Detailed design consultant/ Contractor	Fish ponds at HHW and LMC	Detailed design, construction phase	N/A N/A N/A *
S12.7	E2-DP1	*Construction run-off*	Minimise the indirect impact	Contractor	Seawall,	During	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Temporary sewerage and drainage will be designed and installed to collect wastewater and prevent it from entering nearby water bodies; • Proper locations well away from nearby water bodies will be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction debris and spoil, and these will be identified before commencement of works; • To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies will be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective measures will also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work site; • If temporary access along a riverbed is unavoidable, this will be kept to the minimum in width and length. Temporary river crossings will be supported on stilts above the river bed; • Stockpiling of construction materials, if necessary, will be properly covered and located away from nearby water bodies; • Construction debris and spoil will be covered and/or properly disposed of as soon as possible to avoid being washed into nearby water bodies; • Construction effluent, site run-off and sewage will be properly collected and/or treated. Wastewater from any	from the increasing suspended solids and pollutants in LMC Meander			construction	^ ^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		construction site will be minimised via the following in descending order: reuse, recycling and treatment; • Proper locations for discharge outlets of wastewater treatment facilities well away from sensitive receivers will be identified (i.e. treated wastewater will not be discharged into LMC Meander, natural streams, marsh, reedbed, active or abandoned fish ponds); • Adequate lateral support will be erected where necessary in order to prevent soil/mud from slipping into the Ecological Area or LMC Meander; • Site boundary will be clearly marked and any works beyond the boundary strictly prohibited; • Regular water monitoring and site audit will be carried out at adequate points along LMC Meander, and at the outfalls of the natural streams around LMC Loop. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works will be considered.					^ ^ ^ ^
S12.7	E3-DP1/DP2	*Pollutant Runoff to Downstream areas from Accidental Spillage* • Prepare an emergency contingency plan • The plan will include, but not be limited to, the following: - Potential emergency situations; - Chemicals or hazardous materials used on-site (and their location); - Emergency response team; - Emergency response procedures;	Minimize indirect impact from pollutant runoff to downstream areas from accidental spillage	Contractor/ Operator	Area within project site near streams	Construction phase and operation phase	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		- List of emergency telephone hotlines; - Locations and types of emergency response equipment; - Training plan and testing for effectiveness.					
S12.7	E4-DP1/DP2	• Use opaque, non-transparent, non-reflective noise barriers for all developments associated with the Project. • Design of buildings should not incorporate use of night-time lighting at or near top of buildings, highly reflective materials should not be used where vegetation is adjacent and glass surfaces should not be angled upwards in a way that reflects the sky. Unnecessary lighting should be eliminated. Appropriate glass and façade treatments should be used where required to minimise impact. Unnecessary lighting should be avoided. These include the following: • Fritting, or the placement of ceramic lines or dots on glass, has little effect on the human-perceived transparency of the window but creates a visual barrier to birds outside. This treatment also has the advantage of reducing air conditioning loads by lowering heat gain, while still allowing light transmission for interior spaces. It is most successful when the frits are applied on the outside surface. Frosted glass has similar effects. • Angled glass may be used only for smaller panes in buildings with a limited amount of glass. • The use of glass that reflects UV light (primarily visible to	Minimize the mortality impacts on birds	Developer / Detailed design consultant/ contractor/ operator	Area within project site	Detailed design, construction and operation phases	^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		birds, but not to humans) acts to reduce collision. • Film and art treatment allow glass surfaces to be used a medium of expression, often related to the nature and use of the building, as well indicating to birds their impenetrability. • Lightweight external screens can be added to windows or become a façade element of larger buildings, and are suitable where non-operable windows are prevalent, which is often the case in modern buildings in HK. In terms of reducing night-time mortality impacts, eliminating unnecessary lighting is one of the easiest methods, and has the added advantage of saving energy and expense. Potential impacts of nocturnal avian collision with buildings should be minimised by not creating sky glow from the use of night-time lighting at or near the top of buildings or other structures. In addition to avoiding uplighting, light spillage should be minimised, while green and blue lights should be used where possible. As far as possible, lights should be controlled by motion sensors, and building operations should be managed in such a way as reduce or eliminate night lighting near windows. The potential advantages of removing unnecessary lighting in terms of reducing the carbon footprint of the LMC Loop development are obvious.					^ ^
S12.7	E5-DP1/DP2	• Minimize loss of natural vegetation along LMC Meander, and suitable replacement planting with possible installation of otter holts and the provision of potential feeding area and spraint locations for otters in the stabilized bank subject to detailed design. • No significant change to velocity of water flow, water level or water quality.	Minimize impacts on Eurasian Otter	Detailed design consultant/ Contractor	Construction site within the project	Detailed design, construction phase	^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• No direct lighting on Meander. • 3m high, dull green site boundary fence for all developments associated with the project. • Pre-construction surveys for otter holts or natal dens will be conducted in LMC Loop before the commencement of construction works. Work in the area of any otter holt found to cease pending examination by experienced Ecologist. If in use for breeding, works in the area will temporarily stop until end of breeding activity. • No construction activities within 100m of LMC Meander between one hour prior to sunset and one hour after sunrise. • Provision of compensatory reed marsh in the Ecological Area in LMC Loop, including open water channels and islands within the reed marsh, both of which features are considered to be used by the species.					^ ^ N/A ^ N/A
S12.7	E8-DP2	• Refer to E2 and E3	Prevent impacts on Rose Bitterling, small snakehead and *Somanniathelphus zanklon*	Contractor	Within project site	Construction phase	N/A
S12.7	E10-DP1	• Preserve undisturbed, semi-natural habitat conditions of LMC Meander and adjacent areas of LMC Loop up to approximately 150m in width in order to avoid disturbance to core part of flight line corridor. • This area to comprise an Ecological Area largely constituting reed marsh and a 50m wide buffer zone densely planted with	Minimize impacts on flight line corridor from LMC Loop development	Developer / Detailed design consultant/ Contractor/ Operator	Within project site	Detailed design, construction and operation phases	^ N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		shrubs and trees. Small number of low buildings (max 14mPD high, except the building height of on-site STW is 15mPD high) allowed in inner 25m of this area at a plot ratio of 0.1. • At Ha Wan Tsuen entry point for many birds to LMC Loop area provide a wider Ecological Area to minimise disturbance from nearby buildings. • Further minimisation of impact by maintaining a lower building height in areas adjacent to the buffer zone for the EA. In addition, the sewage treatment works, which is located near the point where many birds cross from the Meander to HHW, should not exceed 15mPD.					N/A N/A
S12.7	E11-DP1	• Employ site boundary fence as long as possible. Use of movable barrier for more intense site formation activity. Provision of fencing with 30cm gap between the existing reed marsh and LMC Meander during the establishment period of Ecological Area and the gap will be closed once established. • Restrict work to period from 0900h to 1700h. All major works along the edge of LMC Meander and in the Ecological Area will be conducted in the wet season.	Minimize disturbance impacts of mitigation provisions	Contractor	Within project site	Construction phase	^ ^
S12.7	E12-DP1/DP2	• Minimal night-time lighting • No direct light on Meander	Minimize impacts on LMC Meander	Contractor/ Operator	All	Construction and operation phases	^ ^
S12.7	E13-	• Construction limited to wet season between the hours of 9am and	Minimize impacts from the	Contractor/	Pond habitat	Construction and	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
	DP2	5pm. • Use of opaque visual/noise barriers and planting of trees shrubs along length of road adjacent to fish ponds. • Compensatory habitat management elsewhere to mitigate wetland loss.	construction and operation disturbance impacts	Operator	along alignment (mainly Ha Wan Tsuen Road)	operation phases	^ ^
S12.7	E16-DP1	• Provision of compensatory reed marsh in the Ecological Area will provide habitat suitable for Common Evening Hawker. • Measures designed to protect other fauna and water quality will generally benefit odonata.	Protect Odonata	Project Proponent/ Detailed design consultant/ Contractor Operator	Ecological area	EA established prior to construction and manage at all phases	^ ^
S12.7	E14-DP2	• Replacement planting of native tree species relevant to Deep Bay area and the area impacted. Planting to occur in tandem with that required for woodland loss arising	Minimize the ecological impacts	Contractor	Woodland and shrubland habitat along Ha Wan Tsuen Road	Construction phase	^
S12.7	E15-DP2	• Use noise/visual barriers to minimise disturbance. • Construction activities should not be carried out before 0900h or after 1700h in order to minimise disturbance to the flight line corridor (and to mammals).	Minimize impacts on flight line corridor from Western Connection Road	Contractor	Construction site from Western Connection Road	Construction phase	^ ^
S12.7	E16-DP2	• Use of opaque visual/noise barriers and roadside planting of trees and shrubs to minimize disturbance impacts.	Minimize impacts on flight line corridor from Western Connection Road	Project Proponent/ Detailed design consultant/ Contractor	Construction site from Western Connection Road	Detailed design, construction and operation phases	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
				Operator			
Fisheries (Construction Phase)							
S13.7	F4-	• Reprovision of replacement Artificial Reefs(of the same volume as the existing ARs inside Marine Exclusion Zone)	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S11.7	F2	• Reduce re-suspension of sediments • Limit dredging and works fronts. • Good site practices • Strict enforcement of no marine dumping • Spill response plan	Minimise marine water quality impacts	Contractor	Seawall	During construction	N/A N/A N/A N/A N/A

Remarks: ^ Compliance of mitigation measure

* Recommendation was made during site audit but improved/rectified by the contractor

N/A Not Applicable at this stage as no such site activities were conducted in the reporting period (e.g. concrete batching plan, barging point, seawall dredging and filling, bored piling, landscaping works etc)