



Lam Environmental Services Limited

Service Contract No: EDO/01/2017
Environmental Team for
Development of Anderson Road Quarry Site
Road Improvement Works
Monthly EM&A Report (November 2019)

SERVICE CONTRACT NO: EDO/01/2017

**ENVIRONMENTAL TEAM FOR
DEVELOPMENT OF
ANDERSON ROAD QUARRY SITE -
ROAD IMPROVEMENT WORKS**

UNDER ENVIRONMENTAL PERMIT NO. EP-513/2016

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

NOVEMBER 2019

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EXECUTIVE SUMMARY

- i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – [November 2019](#) of Development of Anderson Road Quarry Site – Road Improvement Works under Environmental Permit no. EP-513/2016 (Hereafter as “the Project”). The construction works of the Project was commenced on 2 November 2018 and the tentative completion date is end of 2023. This is the [13th](#) EM&A report presenting the environmental monitoring findings and information recorded during the period of [1 November 2019 to 30 November 2019](#). The cut-off date of reporting is at the end of each reporting month.

- ii. In the reporting month, the principal work activities conducted are as follow:
 - [Works in Road Improvement Works 1 \(RIW1\)](#)
 - Earth works (such as temporary soil nail, form working platform etc) at type 1, 1a, 4 to 8 in-progress; No fine concrete construction at RWC2 area is in progress;
 - ELS works at KS27 subway extension is in progress;
 - Excavate works and install lateral support at FE1 was completed;
 - Construction of Slip Road 2 drainage works is in progress;
 - [Works in Road Improvement Works 2 \(RIW2\)](#)
 - Site clearance for Portion 7 is in progress;
 - [Works in Road Improvement Works 3 \(RIW3\)](#)
 - Pre-drilling works for RWD1 at Slope D1 were completed;
 - Mass blinding concrete for RWD1 at Slope D1 was in-progress;
 - Excavation works to rock-head level for mass concrete structure at Slope D2 was completed;
 - Dowel bar installation works for mass concrete structure at Slope D2 was in-progress;
 - Excavation works and piling platform formation for RWD2 at Slope D2 was in-progress;
 - Rock excavation works using drill and split method at Slope D3 along Lin Tak Road are in-progress;
 - Retaining wall construction at slope crest of Slope D3 was in-progress;

- [Air Quality Monitoring](#)

- iii. 1-hour Total Suspended Particulates (TSP) monitoring was conducted at eight monitoring stations. The sampling frequency is 3 times in every 6 days in the reporting month.

- iv. [No action or limit level exceedance was recorded in the reporting period.](#)



Noise Monitoring

- v. Noise monitoring was conducted at five noise monitoring stations once per week in the reporting month.
- vi. No action or limit level exceedance was recorded in the reporting period.

Water Quality Monitoring

- vii. Water quality monitoring was conducted at four monitoring stations three days per week in the reporting month.
- viii. No water can be collected at Station AC1 in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.
- ix. No water can be collected at Station E in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.
- x. One (1) suspended solid limit level exceedance was recorded at Station F on 8 November 2019.

Two (2) suspended solid limit level exceedance was recorded at Station I on 1 and 25 November 2019.

Two (2) turbidity limit level exceedance was recorded at Station I on 1 and 25 November 2019. Investigation of the exceedances in November were still in progress and would be reported in the coming report.

For the exceedances in October, after investigation, the exceedances at Station F on 10 October 2019 may be caused by the discharge of car washing water from the site entrance to the gullies opposite and it was project related.

The exceedances at Station F on 16 October 2019 may because of the rainy weather on 14 and 15 October 2019 and the exceedances at Station I on 25 October 2019 were caused by muddy discharge from unknown sources. These exceedances were not related to project activities.

Site Inspections and Audit

- xi. The Environmental Team (ET) conducted weekly site inspections for the Contract on 1, 8, 15, 22 and 29 November 2019. IEC attended the joint site inspection on 15 November 2019. No non-compliance was found during the site inspection while reminders on environmental measures were recommended.

Complaints, Notifications of Summons and Successful Prosecutions

- xii. No environmental complaint was received in the reporting period.



Reporting Changes

- xiii. There are no particular reporting changes.

Future Key Issues

- xiv. In coming reporting 2 months, the scheduled construction activities and the recommended mitigation measures are listed as follows:

Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none"> • Site formation and temporary soil nail installation at RWC2 Type 1 & 1a and 2; • Site formation and temporary soil nail installation for RIW2 Type 4, 6,7 & 8; • Importation of bored piles plants and machineries for bored pile construction at Platform 1; • No-fines concrete construction at RWC2 area; • Trenchless construction for gasmain redirection upon PMI approval at Slip Road 2; • ELS construction at KS27; • Plate load test for FE1; • Soil nail installation at Slope C1 at Zone 5, 6 and 7; • Site clearance and slope profile formation at Slope C1 at Zone 5 & 6; • Removal of Lamp posts and erect temporary lamp posts; and • Piling Platform erection and Sheetpile installation for Portion 7; • Stage 1 rock excavation at Slope D3; • Retaining wall construction at Slope D3; • Mass blinding concreting works at Slope D1; 	<ul style="list-style-type: none"> • Dust control during dust generating works; • Implementation of proper noise pollution control; and • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.



Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none">• Mini-pile installation works at Slope D1; and• Mass concrete wall construction at Slope D2.	



1 Introduction

1.1 Scope of the Report

- 1.1.1. Lam Environmental Services Limited (LES) has been appointed to work as the Environmental Team (ET) under Environmental Permit (EP) no. EP-513/2016 to implement the Environmental Monitoring and Audit (EM&A) programme as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for Development of Anderson Road Quarry site - Road Improvement Works (Register No.: AEIAR-195/2016).
- 1.1.2. In accordance with Clause 3.4 stated in EP-513/2016, four hard copy and one electronic copy of the monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of each reporting month throughout the entire construction period.
- 1.1.3. In accordance with Section 11.3.1 of the Project EM&A Manual, the first Monthly EM&A Report should be prepared and submitted to EPD within a month after the major construction works commences with the subsequently Monthly EM&A Reports due in 10 works day of the end of each reporting month.

1.2 Structure of the Report

Section 1 *Introduction* – details the scope and structure of the report.

Section 2 *Project Background* – summarizes background and scope of the project, site description, project organization and contact details of key personnel during the reporting period.

Section 3 *Status of Regulatory Compliance* – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

Section 4 *Monitoring Requirements* – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

Section 5 *Monitoring Results* – summarizes the monitoring results obtained in the reporting period.

Section 6 *Compliance Audit* – summarizes the auditing of monitoring results, all exceedances environmental parameters.



- Section 7** **Environmental Site Audit** – summarizes the findings of weekly site inspections undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.
- Section 8** ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution
- Section 9** ***Conclusion***

2 Project Background

2.1 Background

- 2.1.1. The Development of Anderson Road Quarry (ARQ) Site is to provide land and the associated infrastructures for the proposed land uses at the existing ARQ site at the north-eastern of East Kowloon.
- 2.1.2. In addition to the site formation and infrastructure works within the ARQ site, a new bus-to-bus interchange (BBI) at the toll plaza of Tseung Kwan O Tunnel and a series of associated off-site road improvement works and pedestrian connectivity facilities are also proposed to mitigate the potential cumulative traffic impact arising from the proposed ARQ development.
- 2.1.3. The Project under Environmental Permit (EP) (EP No. EP-513/2016) is for the three associated of-site road improvement works which comprises: (i) improvement of junction of (J/O) Lin Tak Road / Sau Mau Ping Road (RIW3) (ii) widening and improvement of sections of Clear Water Bay Road and On Sau Road (RIW2); and (iii) widening and improvement of sections of New Clear Water Bay Road and Shun Lee Tsuen Road (RIW1). The location of the Project is shown [Figure 2.1](#).

2.2 Scope of the Project and Site Description

- 2.2.1. The project contains various Schedule 2 Designated Projects (DPs) that, under the EIAO, require EPs to be granted by the DEP before they may be either constructed or operated. **Table 2.1** summarises the DPs under this Project.

Table 2.1 Schedule 2 Designated Projects under this Project

Item	Designated Project	EIAO Reference
DP2	A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing road	Schedule 2, Part I, A.1

2.3 Project Organization and Contact Personnel

- 2.3.1 Civil Engineering and Development Department is the overall project controllers for the Project. For the construction phase of the Project, Project Engineer, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.

2.3.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in [Figure 2.2](#). Key personnel and contact particulars are summarized in **Table 2.2**:

Table 2.2 Contact Details of Key Personnel

Party	Role	Post	Name	Contact No.	Contact Fax
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Brad Chan	5506 0068	2473 3221
Chun Wo – China Metallurgical Group Corporation Joint Venture	Contractor	Site Agent	Mr. Chris Lam	9801 9974	3965 9854
		Environmental Officer	Ms. King Lam	9570 6187	
ANewR Consulting Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. Adi Lee	2618 2836	3007 8648
Lam Environmental Services Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Sam Lam	6178 3179	2882 3331

2.4 Construction Activities

2.4.1 In the reporting month, the principal work activities conducted are as follow.

Works in Road Improvement Works 1 (RIW1)

- Earth works (such as temporary soil nail, form working platform etc) at type 1, 1a, 4 to 8 in-progress; No fine concrete construction at RWC2 area is in progress;
- ELS works at KS27 subway extension is in progress;
- Excavate works and install lateral support at FE1 was completed;
- Construction of Slip Road 2 drainage works is in progress;

Works in Road Improvement Works 2 (RIW2)

- Site clearance for Portion 7 is in progress;

Works in Road Improvement Works 3 (RIW3)

- Pre-drilling works for RWD1 at Slope D1 were completed;
- Mass blinding concrete for RWD1 at Slope D1 was in-progress;
- Excavation works to rock-head level for mass concrete structure at Slope D2 was completed;
- Dowel bar installation works for mass concrete structure at Slope D2 was in-progress;
- Excavation works and piling platform formation for RWD2 at Slope D2 was

in-progress;

- Rock excavation works using drill and split method at Slope D3 along Lin Tak Road are in-progress;
- Retaining wall construction at slope crest of Slope D3 was in-progress;

2.4.2 In coming reporting 2 months, the scheduled construction activities are listed as follows:

- Site formation and temporary soil nail installation at RWC2 Type 1 & 1a and 2;
- Site formation and temporary soil nail installation for RIW2 Type 4, 6,7 & 8;
- Importation of bored piles plants and machineries for bored pile construction at Platform 1;
- No-fines concrete construction at RWC2 area;
- Trenchless construction for gasmain redirection upon PMI approval at Slip Road 2;
- ELS construction at KS27;
- Plate load test for FE1;
- Soil nail installation at Slope C1 at Zone 5, 6 and 7;
- Site clearance and slope profile formation at Slope C1 at Zone 5 & 6;
- Removal of Lamp posts and erect temporary lamp posts; and
- Piling Platform erection and Sheetpile installation for Portion 7;
- Stage 1 rock excavation at Slope D3;
- Retaining wall construction at Slope D3;
- Mass blinding concreting works at Slope D1;
- Mini-pile installation works at Slope D1; and
- Mass concrete wall construction at Slope D2.

3 Status of Regulatory Compliance

3.1 Status of Environmental Licensing and Permitting under the Project

3.1.1. A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in **Table 3.1**.

Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project

Permits and/or Licences	Permit. No. / Account No.	Valid From	Expiry Date	Status
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	Form NA submitted to EPD on 29 May 2018.			
Environmental Permit	EP-513/2016	20 Jul 2016	N/A	Valid
Construction Noise Permit (CNP)				
Nil	Nil	Nil	Nil	Nil
Billing Account for Disposal				
Billing Account for Disposal of Construction Waste	7031075	20 Jul 2018	End of the Project	Valid
Chemical Waste Registration				
Registration as a Waste Producer for Sau Mau Ping Road to Lin Tak Road	5213-294-C4239-04	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Sau Mau Ping Area between Him Tat House and Sau Mau Ping Salt Water Service Reservoir	5213-293-C4239-05	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for New Clear Water Bay Road (Start from 46 Clear Water Bay Road, End at Shun Lee Tsuen Road and San Lee Street	5213-291-C4239-02	13 Aug 2018	N/A	Valid
Registration as a Waste Producer for South Part of Hiu Ming Street Playground	5213-294-C4239-03	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Clear Water Bay Road and New Clear Water Bay Road (From the intersection of Fei Ngo Shan Road to Tai Pan Court) and on Sau Road (From the intersection of New Clear Water Bay Road to 9 Anderson Road	5213-831-C4239-08	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Sau Mau Ping Area Between Anderson Road and On Sau Road, next to Oi Tat House	5213-292-C4239-06	6 Aug 2018	N/A	Valid
Water Discharge Licence				

Permits and/or Licences	Permit. No. / Account No.	Valid From	Expiry Date	Status
Water Pollution Ordinance Licence for Lin Tak Road to Sau Mau Ping Road including Tseung Kwan O Tunnel Toll Plaza	WT00032742-2018	18 Jan 2019	31 Jan 2024	Valid
Water Pollution Ordinance Licence for Sau Mau Ping Area between Anderson Road and On Sau Road, next to Oi Tat House	WT00033223-2019	31 Jan 2019	31 Jan 2024	Valid
Water Pollution Ordinance Licence for Sau Mau Ping Area at south part of Hiu Ming Street playground	WT00033224-2019	21 Mar 2019	31 Mar 2024	Valid
Water Pollution Ordinance Licence for intersection of Fei Ngo Shan Road to Tai Pan Court and on Sau Road (From the intersection of New Clear Water Bay Road to 9 Anderson Road	WT00033299-2019	5 Mar 2019	31 Mar 2024	Valid
Water Pollution Ordinance Licence for Sau Mau Ping area between Him Tat House and Sau Mau Ping Salt Water service Reservoir	WT00033229-2019	24 Jun 2019	30 Jun 2024	Valid

3.2 Status of Submission under the EP-513/2016

3.2.1. A summary of the current status on submission under EP-513/2016 is shown in **Table 3.2**.

Table 3.2 Summary of submission status under EP-513/2016

EP Condition	Submission	Date of Submission
Condition 1.12	Notification of Commencement Date of Works	24 September 2018
Condition 2.10	Management Organization of Main Construction Companies	27 September 2018
Condition 2.11	Submission of Design Drawing(s) of the Project	28 September 2018
Condition 2.12	Submission of Landscape and Visual Mitigation Plan(s)	28 September 2018
Condition 2.14 (a) and 2.15	Submission of Detailed Vegetation Survey Report (2nd submission)	7 December 2018
Condition 2.14 (b) and 2.15	Submission of Transplantation Proposal	7 December 2018
Condition 3.3	Submission of Baseline Environmental Monitoring Report (2nd submission)	18 December 2018



EP Condition	Submission	Date of Submission
Condition 2.14 (c)	Transplantation Completion Report	3 May 2019
Condition 3.4	Monthly EM&A Report (October 2019)	14 November 2019

4 Monitoring Requirements

4.1 Noise Monitoring

NOISE MONITORING STATIONS

4.1.1. The noise monitoring stations for the Project are listed and shown in **Table 4.1** and [Figure 4.1](#) & [4.2](#).

Table 4.1 Noise Monitoring Station

Monitoring Station ID	Monitoring Location	Measurement Type	Level (in terms of no. of floor)
NMC01	Kei Shun Special School	Façade	G/F
NMC02	Shun Lee Disciplined Services Quarters Block 6	Façade	3/F podium
NMC03	Sienna Garden Block 6	Free-field	G/F
NMC04	Po Tat Estate Tat Kai House	Free-field	3/F podium
NMC05	Hong Wah Court Block B Yee Hong House	Façade	G/F

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.2. Noise monitoring shall be carried out at all the designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- One set of measurements between 0700-1900 hours on normal weekdays (six consecutive Leq/5min readings);
- One set of measurements between 1900-2300 hours;
- One set of measurements between 2300-0700 hours of next day; and
- One set of measurements between 0700-2300 hours on holidays (three consecutive Leq/5min readings).

4.1.3. For the latter 3 sets of measurements specified in Section 4.1.2 above, one set of measurements shall at least include 3 consecutive Leq (5min) results.

4.1.4. Supplementary information for data auditing, statistical results such as L10 and L90 shall also be obtained for reference.

4.1.5. If a school exists near the construction activity, noise monitoring shall be carried out at the monitoring stations for the schools during the examination periods. The ET leader shall liaise with the school's personnel and the examination authority to ascertain the exact dates and times of all examination periods during the course of the contract.

MONITORING EQUIPMENT

4.1.6. Noise monitoring was performed using sound level meter at the designated monitoring locations. The sound level meters shall comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator shall be deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 4.2**.

Table 4.2 Noise Monitoring Equipment

Equipment	Brand and Model	Series Number
Integrated Sound Level Meter	NTi XL2	A2A-15269-E0
	Larson Davis LxT	0005098
Acoustic Calibrator	Larson Davis CAL200	13098 13128

4.1.7. The calibration certificates of the noise monitoring equipment are attached in [Appendix 4.2](#).

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.1.8. Monitoring Procedure

- (a) The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver’s building façade and be at a position 1.2m above the ground.
- (b) Façade measurements were made at the monitoring locations. For free-field measurement, a correction factor of +3 dB (A) would be applied.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
- (e) Frequency weighting: A, Time weighting: Fast, Measurement time set: continuous 5 mins
- (f) Prior and after to the noise measurement, the meter was checked using the acoustic calibrator for 94dB (A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than ±1 dB (A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (g) Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

4.1.9. Maintenance and Calibration



- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The sound level meter and calibrator were calibrated at yearly intervals.

EVENT AND ACTION PLAN

4.1.10. Noise Standards for Daytime Construction Activities are specified under EIAO-TM. The Action and Limit levels for construction noise are defined in **Table 4.3** and [Appendix 4.1](#). Should non-compliance of the criteria occurs, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.3 Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days ²	2300-0700 hrs of all days ²
NMC01	When one documented complaint is received	65 / 70 ¹	60 / 65 / 70 ³	45 / 50 / 55 ³
NMC02		75		
NMC03		75		
NMC04		75		
NMC05		75		

Remark 1: Limit level of NMC01 - Kei Shun Special School reduce to 65 dB (A) during examination periods if any.

Remark 2: Construction noise during restricted hours is under the control of Noise Control Ordinance Limit Level to be selected based on Area Sensitivity Rating.

Remark 3: Limit Level for restricted hour monitoring shall act as reference level only. Investigation would be conducted on CNP compliance if exceedance recorded during restricted hour noise monitoring period.

4.2 Air Monitoring

AIR QUALITY MONITORING STATIONS

4.2.1. The air monitoring stations for the Project are listed and shown in **Table 4.4** and [Figure 4.3](#) & [4.4](#).

Table 4.4 Air Monitoring Station

Monitoring Station ID	Monitoring Location	Level (in terms of no. of floor)
NCWBR_AMS-1	Shun Lee Fire Station	2/F Roof
NCWBR_AMS-2	Shun Lee Estate Lee Hang House	G/F
NCWBR_AMS-3	Shun Lee Disciplined Services Quarters (Block 6)	4/F podium
NCWBR_AMS-4	Sienna Garden	G/F
NCWBR_AMS-5	Shun Chi Court Shun Fung House	Roof
LTR_AMS-1	St Edward's Catholic Primary School	G/F
LTR_AMS-2	Environmental Protection Department's Restored Landfill Site Office	G/F
LTR_AMS-3	Po Tat Estate Tat Kai House	3/F podium

AIR MONITORING PARAMETERS, FREQUENCY AND DURATION

4.2.2. One-hour TSP levels should be measured to indicate the impacts of construction dust on air quality.

4.2.3. The sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.4. Monitoring Procedures

- (a) Check the calibration period of portable direct reading dust meter prior to monitoring (The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly.)
- (b) Record the site condition near / around the monitoring stations.
- (c) Install the portable direct reading dust meter to the monitoring location.
- (d) Slide the power switch to turn the power on.
- (e) Check of portable direct reading dust meter to ensure the equipment operation in normal condition.

- (f) Select the period of measurement to 60mins.
- (g) Check and set the correct time.
- (h) Select the appropriate unit display for the equipment.
- (i) Slide the power switch to turn the power off when the monitoring period ended (3 times 1 hour TSP monitoring per day).
- (j) Uninstall the portable direct reading dust meter
- (k) Collected the sampled data for analysis.
- (l) Remark: Procedures (c) to (h) may be different subject to the brands and models of portable direct reading dust meter

4.2.5. Maintenance and Calibration

- (a) The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly to determine the accuracy and validity of the results measured.
- (b) Checking of direct reading dust meter will be carried out in order to determine the conversion factor between the direct reading dust meter and the standard equipment, HVS. The comparison check is to be considered valid based on correlation coefficient checked by HOKLAS laboratory.

4.2.6. The 1-hour TSP air quality monitoring was performed by using portable direct reading dust meters at each designated monitoring station. The brand and model of the equipment are given in **Table 4.5**.

Table 4.5 Air Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Portable direct reading dust meter	Met One BT- 645	X19299 X19298 X19296 R22586
	Met One AEROCET 831	R14332 W14016 W15448
	HAL HPC301	3011907012

4.2.7. The calibration certificates of the air quality monitoring equipment are attached in [Appendix 4.2](#).

WIND DATA

4.2.8. The representative wind data from Tate’s Cairn HKO Automatic Weather Station and Tseung Kwan O HKO Automatic Weather Station were obtained covering the 1-hr TSP monitoring periods. The wind data were extracted and shown in [Appendix 4.3](#).

EVENT AND ACTION PLAN

4.2.9. The Action and Limit levels for construction air quality are defined in **Table 4.6** and [Appendix 4.1](#). Should non-compliance of the air quality criteria occur, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.6 Action and Limit Level for Air Quality Monitoring

Monitoring Locations	1-hour TSP Level in µg/m3	
	Action Level	Limit Level
NCWBR_AMS-1	284.4	500.0
NCWBR_AMS-2	282.4	500.0
NCWBR_AMS-3	287.9	500.0
NCWBR_AMS-4	281.6	500.0
NCWBR_AMS-5	270.0	500.0
LTR_AMS-1	272.1	500.0
LTR_AMS-2	281.1	500.0
LTR_AMS-3	285.1	500.0

4.3 Water Quality Monitoring

WATER QUALITY MONITORING STATIONS

4.3.1. Water quality monitoring was undertaken at 7 monitoring stations in the reporting month. The proposed water quality monitoring stations of the Project are shown in **Table 4.7** and [Figure 4.5 & 4.6](#).

Table 4.7 Marine Water Quality Stations for Water Quality Monitoring

Inland Water	Stations	Description	Easting	Northing
Channelized nullah across the Project site	E	Upstream Control Station	841329	821753
	F	Downstream Impact Station	841469	821635
	AC1	Upstream Reference Station	-	-
	AC2	Upstream Reference Station	-	-
	AC3	Upstream Reference Station	-	-
Ma Yau Tong Stream	H	Upstream Control Station	843008	819880
	I	Downstream Impact Station	842652	819573

WATER QUALITY PARAMETERS, FREQUENCY AND DURATION

- 4.3.2. The levels of dissolved oxygen (DO), turbidity and pH shall be measured in situ while suspended solids (SS) is determined by laboratory analysis at all the designated monitoring stations.
- 4.3.3. In association with the water quality parameters, other relevant data shall also be recorded, such as monitoring location / position, time, water temperature, salinity, DO saturation, weather conditions, and any special phenomena underway near the monitoring station.
- 4.3.4. The sampling frequency of at least three days per week should be undertaken when the highest dust impact occurs. Upon completion of the construction works, the monitoring exercise at the designated monitoring locations should be continued for four weeks in the same manner as the impact monitoring.
- 4.3.5. The interval between two sets of monitoring should not be less than 36 hours except where there are exceedances of Action and/or Limit Levels, in which case the monitoring frequency will be increased.
- 4.3.6. Replicate in-situ measurements should be carried out in each sampling event.

SAMPLING PROCEDURES AND MONITORING EQUIPMENT

Dissolved Oxygen And Temperature Measuring Equipment

- 4.3.7. The instrument should be a portable, weatherproof dissolved oxygen measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable of measuring:
- a dissolved oxygen level in the range of 0-20 mg/l and 0-200% saturation
 - a temperature of 0-45 degree Celsius
- 4.3.8. It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary. (e.g. YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).
- 4.3.9. Should salinity compensation not be build-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

Turbidity Measurement Instrument

- 4.3.10. The instrument should be a portable, weatherproof turbidity-measuring instrument complete with comprehensive operation manual. The equipment should use a DC power source. It

should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and be complete with a cable (e.g. Hach model 2100P or an approved similar instrument).

Sampler

- 4.3.11. Due to low water level as mentioned in Section 6.4.3 of the EIA report, bucket sampler (Approximate 1L) will be use instead of water sampler in order to obtain surface water sample without disturb the stream sediment and collect representative results.

Salinity

- 4.3.12. A portable salinometer capable of measuring salinity in the range of 0-70 ppt shall be provided for measuring salinity of the water at each of monitoring location.

MONITORING METHODOLOGY

4.3.13. Monitoring Procedure

- (a) The condition near the monitoring stations shall be observed and recorded on the data log sheet.
- (b) Check of sensors and electrodes with certified standard solutions before each use.
- (c) Wet bulb calibration for a DO meter should be carried out before measurement.
- (d) Sample would be taken using bucket sampler at surface level.
- (e) Transfer the sampled water carefully into cleaned water bottles (2x 1000ml) provided by the laboratory at the spot after the collection of the water sample for the subsequent laboratory Suspended Solid testing.
- (f) Transfer the sampled water from the bucket sampler to the rinsed water container for in-situ measurement (In case of the in-situ measurement cannot be carried at spot due to safety and adverse weather condition, sampled water from the bucket sampler will be transfer to cleaned water bottles provided by laboratory. Then, In-situ measurement will be conducted at a safe location which sampled water inside cleaned water bottle will be transfer to the rinsed water container for in-situ measurement) In-situ measurement shall be measured in duplicate.
- (g) Parameters including Water Temperature ($^{\circ}\text{C}$), pH (units), Salinity (ppt), DO (mg/L), DO saturation (%) will be measured by the Multifunctional Meter and Turbidity (NTU) will be measured by turbid meter. (Water Temperature and Salinity will be measured as reference parameters)
- (h) Record the result on the data log sheet and record any special finding during / after in-situ measurement.
- (i) The water sample bottles will be stored in a cool box (at cooled to 4°C without being frozen), which shall be delivered to HOKLAS laboratory (ALS Technichem (HK) Pty Ltd) for further testing to determine the level of SS.

4.3.14. Maintenance and Calibration

- (a) The responses of sensors and electrodes of the water quality monitoring equipment

were cleaned and checked at regular intervals.

- (b) DO meter (Multifunctional Meter) and turbid meter was certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at three monthly intervals.

4.3.15. Brand and model of the equipment are given in **Table 4.8**.

Table 4.8 Water Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Multifunctional Meter	YSI Professional Plus	16J100298 17F100236
Turbid meter	Xin Rui WGZ-3B	1807077 1807079

4.3.16. The calibration certificates of the water quality monitoring equipment are attached in [Appendix 4.2](#).

LABORATORY MEASUREMENT / ANALYSIS

4.3.17. Analysis of suspended solids has been carried out in a HOKLAS accredited laboratory, which is ALS Technichem (HK) Pty Ltd.

EVENT AND ACTION PLAN

4.3.18. The Action and Limit levels for construction water quality are defined in **Table 4.9** and [Appendix 4.1](#). Should the monitoring results of the water quality parameters at any designated monitoring station exceed the water quality criteria, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.9 Action and Limit Level for Water Quality Monitoring

Monitoring Station	Surface pH		Surface DO (mg/L)		Surface Turbidity (NTU)		Surface SS (mg/L)	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
E	-	-	-	-	-	-	-	-
F	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.8	5.5	24.4	32.7	17.0	23.8
AC1	-	-	-	-	-	-	-	-



AC2	-	-	-	-	-	-	-	-
AC3	-	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-	-
I	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.5	5.4	206.9	214.2	172.8	201.4

*Remarks:

The value of 1.0mg/L was taken as the value for measurement with suspended solid level of <1.0mg/L for Action and Limit level calculation.

It is recommended that upstream monitoring station (monitoring station E, AC1, AC2, AC3 and H) would be taken as control reference for exceedance investigation only. Action and limit level would not be establish using the baseline data.

5. Monitoring Results

5.0.1 The environmental monitoring will be implemented based on the division of works areas of each designed projects. Overall layout showing work areas and monitoring stations is shown in [Figure 2.1](#) and Figure 4.1 – 4.6 respectively.

5.0.2 The environment monitoring schedules for reporting month and coming month are presented in [Appendix 5.1](#).

5.1 Noise Monitoring Results

5.1.1 All noise monitoring was conducted as scheduled in the reporting month.

5.1.2 There was no examination period for NMC01 during the reporting period.

5.1.3 Noise monitoring results measured in this reporting period are reviewed and summarized. Details of noise monitoring results and graphical presentation can be referred in [Appendix 5.2](#).

5.2 Air Monitoring Results

5.2.1 All 1-hour TSP monitoring was conducted as scheduled in the reporting month.

5.2.2 No action or limit level exceedance was recorded in the reporting period.

5.2.3 Air quality monitoring results measured in this reporting period are reviewed and summarized. Details of air monitoring results and graphical presentation can be referred in [Appendix 5.3](#).

5.3 Water Quality Monitoring Results

5.3.1 All water quality monitoring was conducted as scheduled in the reporting month.

5.3.2 No water can be collected at Station AC1 in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.

5.3.3 No water can be collected at Station E in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.

5.3.4 One (1) suspended solid limit level exceedance was recorded at Station F on 8 November 2019.

Two (2) suspended solid limit level exceedance was recorded at Station I on 1 and 25 November 2019.

Two (2) turbidity limit level exceedance was recorded at Station I on 1 and 25 November 2019



Investigation of the exceedances in November were still in progress and would be reported in the coming report.

For the exceedances in October, after investigation, the exceedances at Station F on 10 October 2019 may be caused by the discharge of car washing water from the site entrance to the gullies opposite and it was project related.

The exceedances at Station F on 16 October 2019 may because of the rainy weather on 14 and 15 October 2019 and the exceedances at Station I on 25 October 2019 were caused by muddy discharge from unknown sources. These exceedances were not related to project activities.

5.3.5 Water quality monitoring results measured in this reporting period are reviewed and summarized. Details of water quality monitoring results and graphical presentation can be referred in [Appendix 5.4](#).

5.4 Waste Management

5.4.1 The quantities of waste for disposal in the Reporting Period are summarized in **Table 5.1** and **Table 5.2**. The Monthly Summary Waste Flow Table is shown in [Appendix 5.5](#). Whenever possible, materials were reused on-site as far as practicable.

Table 5.1 Summary of Quantities of Inert C&D Materials

Waste Type	Quantity (this month)	Quantity (Project commencement to the end of last month)	Cumulative Quantity-to-Date	Disposal Location
Hard Rock and Large Broken Concrete (Inert) (in '000m3)	0	0	0	Nil
Reused in this Contract (Inert) (in '000m3)	0.090	0.571	0.661	Nil
Reused in other Projects (Inert) (in '000m3)	2.145	5.371	7.516	Nil
Disposal as Public Fill (Inert)	4.000	15.192	19.192	TKO137



Waste Type	Quantity (this month)	Quantity (Project commencement to the end of last month)	Cumulative Quantity-to-Date	Disposal Location
(in '000m3)				

Table 5.2 Summary of Quantities of C&D Wastes

Waste Type	Quantity (this month)	Quantity (Project commencement to the end of last month)	Cumulative Quantity-to-Date	Disposal Location
Metals (in '000kg)	0.002	0.035	0.037	Nil (waste recycle was arranged)
Paper / Cardboard Packing (in '000kg)	0.106	0.689	0.795	Nil (waste recycle was arranged)
Plastics (in '000kg)	0.003	0.053	0.056	Nil (waste recycle was arranged)
Chemical Wastes (in '000kg)	0	0	0	Nil
General Refuses (in '000m3)	0.044	0.34	0.384	SENT



6. Compliance Audit

6.0.1. The Event Action Plan for construction noise, air quality and water quality are presented in [Appendix 6.1.](#)

6.0.2. The summary of exceedance is presented in [Appendix 6.2.](#)

6.1 Noise Monitoring

6.1.1 No action or limit level exceedance was recorded in the reporting period.

6.2 Air Quality Monitoring

6.2.1 No action or limit level exceedance was recorded in the reporting period.

6.3 Water Quality Monitoring

6.3.1 No water can be collected at Station AC1 in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.

6.3.2 No water can be collected at Station E in November 2019 as the station was dried out during the monitoring scheduled in the reporting month.

6.3.3 One (1) suspended solid limit level exceedance was recorded at Station F on 8 November 2019.

Two (2) suspended solid limit level exceedance was recorded at Station I on 1 and 25 November 2019.

Two (2) turbidity limit level exceedance was recorded at Station I on 1 and 25 November 2019

Investigation of the exceedances in November were still in progress and would be reported in the coming report.

For the exceedances in October, after investigation, the exceedances at Station F on 10 October 2019 may be caused by the discharge of car washing water from the site entrance to the gullies opposite and it was project related.

The exceedances at Station F on 16 October 2019 may because of the rainy weather on 14 and 15 October 2019 and the exceedances at Station I on 25 October 2019 were caused by muddy discharge from unknown sources. These exceedances were not related to project activities.

6.4 Review of the Reasons for and the Implications of Non-compliance

6.4.1 No environmental non-compliance was recorded in the reporting month.



6.5 Summary of action taken in the event of and follow-up on non-compliance

- 6.5.1 There was no particular action taken since no non-compliance was recorded in the reporting period.

7. Environmental Site Audit

7.0.1. Within this reporting month, weekly environmental site audits were conducted on 1, 8, 15 22 and 29 November 2019. IEC attended the joint site inspection on 15 November 2019.

7.0.2. No non-compliance was found during the site inspection while reminders on environmental measures were recommended. Results and findings of these inspections in this reporting month are listed below in Table 7.1.

Table 7.1 Summary of Environmental Inspections

Date	Item	Reminder(s)/ Observation(s)	Action taken by Contractor	Outcome
1-11-2019	20191101_01	3 sides cover with top should be provided for grouting works (RIW1)	The facilities has been removed.	Completion as observed on 22 November 2019.
1-11-2019	20191101_02	The used cement bags should be covered or disposed properly to avoid spreading of dust (RIW1)	The cement bags has been disposed.	Completion as observed on 22 November 2019.
8-11-2019	20191108_01	The sludge in the U-channel need to be cleared (RIW3, slope D3)	The sludge was still observed on 6 Dec 2019.	On-going
8-11-2019	20191108_02	Drip tray should be provided for holding chemical containers. (RIW3, slope D3)	The chemical containers were removed.	Completion as observed on 6 December 2019.
15-11-2019	20191115_01	Water spraying is needed at RIW2 for dust suppression.	The condition has been improved.	Completion as observed on 21 November 2019.
22-11-2019	20191122_01	Mitigation measures should be enhanced for dusty works like providing more covers or enclosure whatever feasible at RIW1.	The dusty works has been finished	Completion as observed on 29 November 2019.
29-11-2019	20191129_01	The NRMM label should be printed with correct colour. (RIW1)	Pending	Pending
29-11-2019	20191129_02	Drip tray should be provided for holding chemical containers. (RIW1)	Pending	Pending

7.0.3. Within this reporting month, biweekly landscape site audits were conducted on 6 and 20 November 2019.

7.0.4. No non-compliance was found during the landscape site inspection. Results and findings of these inspections in this reporting month are listed below in Table 7.2.



Table 7.1 Summary of Landscape site inspections

Date	Item	Reminder(s)/ Observation(s)	Action taken by Contractor	Outcome
6 Nov 2019	-	No particular findings	-	-
20 Nov 2019	-	No particular findings	-	-

8. Complaints, Notification of Summons and Prosecution

8.0.1. No environmental complaint was received in the reporting period.

8.0.2. The details of cumulative complaint log and updated summary of complaints are presented in [Appendix 8.1](#).

8.0.3. Cumulative statistic on complaints and successful prosecutions are summarized in **Table 8.1** and **Table 8.2** respectively.

Table 8.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
November 2019	0
Project commencement to the end of last reporting month	1
Total	1

Table 8.2 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	-	0	0
Noise	-	0	0
Water	-	0	0
Waste	-	0	0
Total	-	0	0

9. Conclusion

- 9.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed were made in response to changing circumstances.
- 9.0.2. The performance of the environmental management system of the previous three months (quarter) was generally satisfied. Mitigation measures according to the environmental mitigation implementation schedule and the EIA were generally implemented by the Contractor. Hence, the EM&A programme was considered effective and shall be maintained. The status of the water quality station shall be kept in view, as station E usually was dried out.
- 9.0.3. The scheduled construction activities and the recommended mitigation measures for the coming 2 months are listed in **Table 9.1**. The construction programmes of the Project are provided in [Appendix 9.1](#).

Table 9.1 Construction Activities and Recommended Mitigation Measures in Coming Reporting 2 Months

Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none"> • Site formation and temporary soil nail installation at RWC2 Type 1 & 1a and 2; • Site formation and temporary soil nail installation for RIW2 Type 4, 6,7 & 8; • Importation of bored piles plants and machineries for bored pile construction at Platform 1; • No-fines concrete construction at RWC2 area; • Trenchless construction for gasmain redirection upon PMI approval at Slip Road 2; • ELS construction at KS27; • Plate load test for FE1; • Soil nail installation at Slope C1 at Zone 5, 6 and 7; • Site clearance and slope profile formation at Slope C1 at Zone 5 & 6; • Removal of Lamp posts and erect temporary lamp posts; and 	<ul style="list-style-type: none"> • Dust control during dust generating works; • Implementation of proper noise pollution control; and • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.



Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none">• Piling Platform erection and Sheetpile installation for Portion 7;• Stage 1 rock excavation at Slope D3;• Retaining wall construction at Slope D3;• Mass blinding concreting works at Slope D1;• Mini-pile installation works at Slope D1; and• Mass concrete wall construction at Slope D2.	