JOB NO.: TCS01267/22

CONTRACT NO. EP/SP/186/21

WEST NEW TERRITORIES LANDFILL EXTENSION

QUARTERLY ENVIRONMENTAL MONITORING AND AUDIT SUMMARY REPORT – OCTOBER TO DECEMBER 2024

PREPARED FOR

HONG KONG RESOURCES RECOVERY PARK

Date	Reference No.	Prepared By	Certified By
8 January 2025	TCS01325/23/600/R0087v1	Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	8 January 2024	First Submission

Our Ref: TCS01325/23/300/L0090

Hong Kong Resources Recovery Park
29/F China Overseas Building,
139 Hennessy Road, Hong Kong

Attn: Mr. Kenneth Lau

13 January 2025
By email

Dear Sir,

Re: Contract No. EP/SP/186/21
West New Territories Landfill (WENT) Extension
EM&A Manual Section 2.10.2 and Section 13.3
ETL's Certification Letter for
Quarterly Environmental Monitoring and Audit Summary Report (October to December 2024)

With reference to the Quarterly Environmental Monitoring and Audit Summary Report (October to December 2024 (TCS01325/23/600/R0087v1), we hereby certify this submission in accordance with EM&A Manual Section 2.10.2 and Section 13.3.

Should you have any queries or require further information, please feel free to the undersigned at Tel: 2959-6059 or Fax: 2959-6079.

Yours sincerely,
For and on Behalf of
Action-United Environmental Services & Consulting

Tam Tak Wing
Environmental Team Leader

ANEWR

Environmental Protection Department
2nd floor, West Wing
Island West Transfer Station
88 Victoria Road
Kennedy Town
Hong Kong

Your reference:

Our reference: HKEPD259/50/110274

Date: 14 January 2025

Attention: Ms Kins Lo

BY EMAIL & POST
(email: wklo@epd.gov.hk)

Dear Sirs

Quotation Ref. 23-02230
Provision of Independent Environmental Checker Consultancy Services for
West New Territories Landfill Extension
Quarterly Environmental Monitoring and Audit Report – October to December 2024

We refer to emails of 10, 13 January 2025 from Hong Kong Resources Recovery Park attaching the Quarterly Environment Monitoring and Audit Report – October to December 2024 of the captioned.

We have no comment and hereby verify the captioned report in accordance with Clause 3.5 of the Environmental Permit (EP No.: EP-393/2010/A) and Further Environmental Permit (FEP No. FEP-01/393/2010/A).

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Kieran Lau at 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

James Choi
Independent Environmental Checker

CPSJ/LCCR/LHYK/thy

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ISO 9001 : 2015
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EXECUTIVE SUMMARY

INTRODUCTION

ES.01 In August 2023, Hong Kong Resources Recovery Park (hereinafter named "HKRRP" or "the Contractor")) was awarded the Design, Build and Operate (DBO) Contract of Contract No. EP/SP/186/21 West New Territories Landfill Extension (hereinafter named "the Project"). Further Environmental Permit no. FEP-01/393/2010/A (hereinafter named "the EP") was granted to HKRRP from Environmental Protection Department (EPD) on 6 October 2023.

ES.02 Action-United Environmental Services & Consulting (hereinafter called "AUES") was appointed by HKRRP as the Environmental Team (the "ET") to implement environmental monitoring and auditing (EM&A) programme for the initial phase of the Project.

ES.03 This is the **3rd** Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Project for the period from **1st October 2024 to 31st December 2024** (hereinafter called 'the Reporting Quarter).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.04 Environmental monitoring activities under the EM&A programme of the Project in the Reporting Quarter are summarized in the following table.

Environmental Aspect	Monitoring Parameter	Monitoring Station/ Location	Date / Number of Monitoring
Air Quality	1-hour Total Suspended Particulates	AM(D)1, AM(D)2, AM(D)3, AM(D)5a, AM(D)6a, AM(D)7a	558 sessions
	24-hour Total Suspended Particulates		186 sessions
Noise	$L_{eq(30min)}$ Daytime	NM1	14 sessions
Water Quality (Surface water)	DO, Turbidity, pH, SS and chemical parameters etc.	WM1	3 sessions (7th Oct, 7th Nov and 5th Dec 2024)
Site Inspection	Site audit for implementation of mitigation measures	Entire site	13 sessions

ACTION AND LIMIT (A/L) LEVELS EXCEEDANCE

ES.05 In the Reporting Quarter, no exceedances of air quality monitoring, construction noise (including Action Level for noise complaint) and surface water monitoring were recorded. The summary of exceedances recorded in the Reporting Quarter is shown table below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality (Surface water)	DO	0	0	0	--	--
	Turbidity	0	0	0		
	pH	0	0	0		
	SS	0	0	0		

ES.06 The LFG monitoring was conducted for excavation and/ or blasting works in October, November and December 2024. No exceedance of Limit Levels of LFG was recorded during the Reporting Quarter.

ES.07 For landscape and visual, implementation of mitigation measures during construction phase of the Project has been monitored through regular site inspection/ audit.

ES.08 The Contractor is advised to implement the waste management plan and minimise the wastes generated through recycling or reusing. All mitigation measures stipulated in the updated EM&A Manual and waste management plans shall be fully implemented.

SITE INSPECTION

ES.09 In the Reporting Quarter, weekly joint site inspection to evaluate the site environmental performance had been carried out by the representatives of the Service Manager (SM), ET and the Contractor. No non-compliance was noted during the site inspection. In addition, Independent Environmental Checker (IEC) carried out the joint site inspections on 10th October 2024, 15th November 2024 and 12th December 2024.

ENVIRONMENTAL COMPLAINT

ES.10 In the Reporting Quarter, no environmental complaint was received.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.11 In the Reporting Quarter, no environmental summons and prosecutions were recorded.

REPORTING CHANGE

ES.12 There is no reporting change in the Reporting Quarter.

FUTURE KEY ISSUES

ES.13 Water quality mitigation measures shall be fully implemented in accordance with the Implementation Schedule for Environmental Mitigation Measures of the updated EM&A Manual.

ES.14 In addition, the Contractor should fully implement the recommended air quality mitigation measures to minimize the impact of construction dust as far as practicable.

ES.15 Construction noise would be a key environmental issue during construction work of the Project. In accordance with the EP, a noise bund of 3.5m tall has been constructed along the north eastern seafront of the existing landfill as shown in Figure 2 of the EP prior to the commencement of construction. It is reminded that the noise bund shall be properly maintained during the construction, operation and restoration of the Project.

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1 INTRODUCTION

1.1 BACKGROUND

1.1.1 The West New Territories Landfill Extension (WENTX) is classified as a Designated Project (DP) under Schedule 2, Part I of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). The Environmental Impact Assessment (EIA) Report (AEIAR-147/2009) of WENTX was approved in November 2009 and the respective Environmental Permit no. EP-393/2010 was granted in June 2010. For the WENTX development scheme adopted in the WENTX-EIA in 2009 (hereby referred to the Original Scheme), an area of about 188 hectares of land adjacent to the existing WENT landfill was considered that to be provided approximately 81 million m^3 (Mm^3) of additional landfill capacity.

1.1.2 In consideration of the interfacing projects, commitments and neighbourhood enhancement initiatives were proposed and in conjunction with the project, the reference design and implementation programme for the WENTX (hereby referred to the Enhanced Scheme) has been revised. Under the Enhanced Scheme, the boundary of WENTX has been reduced and the waste filling area and landfill capacity has been updated to 94 ha and 76 Mm^3 respectively. Variation of Environmental Permit (application number VEP-617/2022) was applied by the project proponent and EP-393/2010/A was issued by Environmental Protection Department (EPD) on 29 July 2022 subsequently. The location plan of Enhanced Scheme of WENTX Landfill Extension is shown on ***Appendix A***.

1.1.3 In August 2023, Hong Kong Resources Recovery Park (hereinafter named "HKRRP") was awarded the Design, Build and Operate (DBO) Contract of WENTX (hereinafter named "the Project"). Further Environmental Permit no. FEP-01/393/2010/A (hereinafter named "the EP") was granted to HKRRP from EPD on 6 October 2023.

1.2 DESCRIPTION OF THE PROJECT

General Description of the Project

1.2.1 The development of the WENT Landfill Extension will involve the following works:

- Site formation and preparation;
- Installation of landfill infrastructures including leachate treatment plant, landfill gas management plant, power generators, workshops and site offices;
- Installation of liner system;
- Installation of leachate collection, treatment and disposal facilities;
- Installation of gas collection and utilization facilities;
- Provision of utilities and drainage;
- Landfill operation;
- Restoration and aftercare in subsequent stages; and
- Implementation of measures to mitigate environmental impact as well as environmental monitoring and audit.

1.3 IMPLEMENTATION OF EM&A PROGRAMME

1.3.1 Action-United Environmental Services & Consulting (hereinafter called "AUES") was appointed by HKRRP as the Environmental Team (ET) to implement environmental monitoring and auditing (EM&A) programme for the initial phase of the Project.

1.3.2 In accordance with EP-393/2010/A and FEP-01/393/2010/A Condition 3.1, an updated EM&A Manual has been prepared to include the latest EM&A requirement in accordance with the information and recommendation described in the EIA Report and by taking into account

any specific site conditions that may be changed before the construction of the Project. It outlines the monitoring and audit programme for the Project for the construction phase and provided systematic procedures for monitoring, auditing and minimizing environmental impacts ensure compliance with the EIA recommendations.

1.3.3 Baseline monitoring for air quality, background noise and surface water quality were conducted from 3rd January 2024 to 31st March 2024 by the ET at all the designated or any alternative monitoring locations in accordance with the updated EM&A Manual before commencement of construction work under the project. Baseline Monitoring Report has been prepared to present the relevant baseline data and determine the set of Action and Limit Levels (A/L Levels) for the construction phase of the Project.

1.3.4 In view of commencement of construction work of Project on 3rd April 2024, the Construction Phase EM&A monitoring for relevant impact monitoring was commenced subsequently.

1.3.5 This is the **3rd** Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Project for the period from **1st October 2024 to 31st December 2024** (hereinafter called 'the Reporting Quarter).

1.4 REPORT STRUCTURE

1.4.1 The Quarterly EM&A Report is structured into the following sections:-

Section 1 *Introduction*
Section 2 *Project Organization and Construction Progress*
Section 3 *Summary of Impact Monitoring Requirements*
Section 4 *Air Quality Monitoring*
Section 5 *Construction Noise Monitoring*
Section 6 *Water Quality Monitoring*
Section 7 *Ecology Monitoring*
Section 8 *Landfill Gas Monitoring*
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 CONSTRUCTION PROGRESS AND PROJECT ORGANISATION

2.1 PROJECT ORGANISATION

2.1.1 The project organization and the key personal contact are shown in ***Appendix B***, which consists of the Project Proponent (EPD/ Environmental Infrastructure Division), Contractor, ET, Independent Environmental Checker (IEC), and Service Manager (SM) etc. It should be established to take the responsibilities for environmental protection for this landfill extension project. The IEC will be appointed by the Project Proponent to conduct independent auditing of the overall EM&A programme including environmental and operation monitoring, implementation of mitigation measures, EM&A submissions, and any other submissions required under the EP. The individual responsibilities are:

Environmental Protection Department (EPD)

EPD/ Environmental Infrastructure Division is the Project Proponent of the Project.

Contractor

- Employment of an ET to carry out environmental monitoring, laboratory analysis and reporting of environmental monitoring and audit;
- Submission of proposals of mitigation measures in case of exceedances of Action and Limit (A/L) Levels in accordance with the Event and Action Plan (EAP);
- Implementation of mitigation measures to reduce the impacts where A/L Levels are exceeded; and
- Adherence to the agreed procedures for carrying out complaint investigation.

ET

- Setting up of all the required environmental monitoring stations;
- Monitoring of various environmental parameters as required;
- Analysis of monitoring and audit data and review the success of EM&A programme to cost-effectively confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carrying out site inspections to investigate and audit the Contractor's site practices, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to resolve problems;
- Auditing and preparation of audit reports on environmental monitoring data and site conditions;
- Reporting of environmental monitoring and audit results to the IEC, Contractor, SM and Project Proponent or its delegated representative;
- Recommendation of suitable mitigation measures to the Contractor in case exceedance of A/L Levels in accordance with the EAP;
- Undertaking of regular on-site audits/ inspections and reporting to the Contractor and SM of any potential non-compliance; and
- Following up and closing out of non-compliance actions.

IEC

- Review of EM&A programme by the ET (at not less than monthly intervals);
- Auditing of monitoring activities and results (at not less than monthly intervals);
- Reporting of audit results to the SM and Project Proponent in parallel;
- Reviewing of EM&A reports (monthly, quarterly and annual summary reports) submitted by the ET;
- Reviewing of proposal of mitigation measures submitted by the Contractor in accordance with the EAP;

- Checking of mitigation measures recommended in the EIA Report and EM&A Manual, and ensuring they are properly implemented in timely manner when required; and
- Reporting of findings of site inspections and other environmental performance reviews to SM and Project Proponent.

SM

- Verification and checking Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Informing Contractor when action is required to reduce impacts in accordance with the EAP; and
- Ensure compliance with the agreed EAP in case any exceedance.

2.1.2 Sufficient and suitably qualified professional and technical staff should be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme for the duration of the Project.

2.2 CONSTRUCTION PROGRESS

2.2.1 The 3-month construction programme of the Project are shown in ***Appendix C***, and the major construction activities carried out in the Reporting Quarter are listed below:-

Reporting Month	Major construction activities
October 2024	Portion A1, B1a, B1c & B6 • Soft excavation • Hard excavation • Blasting Portion B10 • Site clearance and pre-drilling work • Piling work • Leachate Treatment Works & Landfill Gas Treatment Plant Portion C1 • Temporary Site Office construction • External manholes construction • Temporary drainage diversion at nullah Portion B2 • J-Channel Construction Portion C7 • Loading and unloading pre-cast unit and construction material Portion D1 • Pipe Laying Works
November 2024	Portion A1, B1a, B1c & B6 • Soft excavation • Hard excavation • Blasting

	Portion B10 • Piling work • Leachate Treatment Works & Landfill Gas Treatment Plant Portion C1 • Temporary Site Office construction • External manholes construction • Temporary drainage diversion at nullah Portion B2 • J-Channel Construction Portion C7 • Loading and unloading pre-cast unit and construction material Portion D1 • Pipe Laying Works
December 2024	Portion A1, B1a, B1c & B6 • Soft excavation • Hard excavation • Blasting Portion B10 • Piling work • Leachate Treatment Works & Landfill Gas Treatment Plant Portion C1 • Temporary Site Office construction • External manholes construction • Temporary drainage diversion at nullah Portion B2 • J-Channel Construction Portion C7 • Loading and unloading pre-cast unit and construction material Portion D1 • Pipe Laying Works Portion B8 • Soil Nail Works

2.3 SUMMARY OF ENVIRONMENTAL LICENSES AND PERMITS

2.3.1 To implement the project works, summary of the relevant permits, licenses, and/or notifications on environmental protection are presented in ***Table 2-1.***

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
1	Environmental Permit	FEP-01/393/2010/A	6 Oct 2023	--
2	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7048594	22 Sep 2023	--
3	Chemical Waste Producer Registration	WPN: 5213-431-H4441-01	18 Oct 2023	--
4	Water Pollution Control Ordinance - Discharge License	WT10002363-2023 (Portion C1)	6 May 2024	31 May 2029
		WT10002525-2023 (Portion B1a)	6 May 2024	31 May 2029
		WT00045324-2024 (Portion B2)	12 Dec 2024	31 Dec 2029
5	Noise Control Ordinance – Construction Noise Permit	GW-RW0702-24 (Portion C1)	18 Aug 2024	17 Nov 2024
		GW-RW1068-24 (Portion C1)	18 Nov 2024	17 Feb 2025
		GW-RW1248-24 (Portion C1)	27 Dec 2024	26 Mar 2025
		GW-RW0988-24 (Portion C7)	22 Oct 2024	21 Jan 2025
		GW-RW0643-24 (Portion B1a)	19 Jul 2024	18 Oct 2024
		GW-RW0981-24 (Portion B1a)	19 Oct 2024	18 Jan 2025
		GW-RW1070-24 (Portion B1a)	8 Nov 2024	7 Feb 2025
		GW-RW1127-24 (Portion B1a)	22 Nov 2024	21 Feb 2025
		GW-RW0922-24 (Portion B2)	28 Sep 2024	27 Dec 2024
		GW-RW1061-24 (Portion B2)	8 Nov 2024	7 Feb 2025
		GW-RW0709-24 (Portion B4)	4 Aug 2024	3 Nov 2024
		GW-RW0686-24 (Portion B9)	29 Jul 2024	28 Oct 2024
		GW-RW1011-24 (Portion B9)	29 Oct 2024	28 Jan 2025

3 AIR QUALITY MONITORING

3.1 MONITORING REQUIREMENTS

3.1.1 Monitoring of the Total Suspended Particulate (TSP) levels shall be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action be taken to rectify the situation. 1-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. The 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, USA, Chapter 1 (Part 50), Appendix B. Upon approval by the IEC, 1-hour TSP levels can be measured by direct reading methods which are capable of producing comparable results as that by the high volume sampling method, to indicate short event impacts.

3.1.2 All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and other special phenomena and work progress of the concerned site etc. shall be recorded down in details.

3.1.3 The ET shall carry out impact monitoring during the course of the Works. In case of non-compliance with the dust criteria, more frequent monitoring exercise, as specified in the Action Plan, shall be conducted within 24 hours after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified.

3.2 MONITORING PARAMETER, FREQUENCY AND DURATION

3.2.1 In accordance with the EP requirement, for regular impact monitoring, the sampling frequency of at least twice in every six-days, shall be strictly observed at all the monitoring stations for 24-hr TSP monitoring. For 1-hr TSP monitoring, the sampling frequency of at least six times in every six-days should be undertaken when the highest dust impact occurs. The specific time to start and stop the 24-hr TSP monitoring shall be clearly defined for each location and be strictly followed by the Contractor.

3.3 MONITORING LOCATIONS

3.3.1 Five dust monitoring locations have been recommended in the approved Final EM&A Manual and two additional monitoring stations (AM(D)6 and AM(D)7) were suggested in VEP supporting document. Joint site visits by the Contractor and ET have been conducted at the recommended locations to verify their status and obtain agreement to install dust monitoring equipment for before the implementation of EM&A Programme.

3.3.2 When alternative monitoring locations are proposed, the following criteria, as far as practicable, should be followed:

- At the site boundary or such locations close to the major dust emission source;
- Close to the sensitive receptors; and
- Account for the prevailing meteorological conditions

<u>Proposed Alternative Locations</u>

<u>AM(D)4</u>

A formal email has been sent to Black Point Power Station on 27th December 2023 for access authorization to the premise in order to carry out dust monitoring. The corresponding team of Black Point Power Station replied that due to the safety and security reason, they rejected to provide access for dust monitoring activities in their premise.

After AM(D)4 (Black Point Power Station Office and Control Room) rejected the proposal of installing dust monitoring equipment within their premises, alternative locations were sought which included locations near the Lung Kwu Sheung Tan Village Supply Tank and Lung Kwu Sheung Tan Service Reservoir. Visits to the above 2 locations were made after the rejection received on 18 January 2024 for 4 weeks and it was concluded that there was no site personnel permanently stationed at these 2 locations and these premises are probably visited by personnel on an ad-hoc basis. Furthermore, it was observed that building/office have been equipped with air-conditioning with dust filter, with the implementation of the dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation, adverse air quality impact is not anticipated at these 2 locations. Thus, it was concluded that no further alternation location can be considered.

AM(D)5

During baseline monitoring conducted at AM(D)5 on 27th Jan to 9th Feb 2024, it has been observed that 9 out of 14 monitoring days recorded 24-hour TSP levels exceeding the Limit Level (260μg/m^3). Investigation was conducted to identify cause of high baseline 24-hour TSP result, and it is considered that the frequent passage of heavy vehicles, particularly on the unpaved access road to the nearby warehouses, was the main contributing factor to the elevated 24-hour TSP levels. As the baseline level for 24-hour TSP at AM(D)5 exceeded the limit level, and the exceedances were due to the local traffic. In accordance with the updated EM&A Manual, ET had conducted a second set of baseline monitoring at new location closer to the WENTX site, which demonstrate a more representative data on dust impact associated from WENTX (hereinafter named AM(D)5a) for the parameters of 1-hour and 24-hour TSP from 16th to 31st March 2024.

AM(D)6

Site visit and meeting with T · Park was held on 15th January 2024 and it is concluded and agreed that air quality monitoring equipment should be relocated to the rooftop of T · Park workshop instead of the T · Park office, which is the best available alternative monitoring location in the facility. The distance between T · Park office and workshop is approximately 100m. They are both located to the north of the site boundary and experiencing the same prevailing meteorological conditions.

AM(D)7

Site visit was conducted at the proposed designated location on 28th December 2023, and after discussion with the management representative of the premises, access authorization to carry out dust monitoring was rejected due to unsuitable conditions.

An alternative location has been sought based on the recommended criteria. It is proposed to relocate the monitoring location (north facing) to the site boundary of Middle Tsang Tsui Ash Lagoon and at the location avoid the emission from the premises (east facing). The proposed alternative monitoring location AM(D)7a is approximately 10 meters away from the designated location AM(D)7. Both locations are situated to the north-west of the site boundary and experiencing the same prevailing meteorological conditions. The southern boundary of the Tsang Tsui Columbarium site such as the entrance area has been explored subsequently, but it is not feasible without stable electricity.

The updated dust monitoring locations have been included in the updated EM&A Manual. The proposed dust monitoring locations for impact monitoring are shown in ***Table 3-1*** and illustrated in ***Appendix D***.

Table 3-1 Dust Monitoring Locations

Station ID	ASR ID	Location	Land use
AM(D)1	A1-1	Ha Pak Nai	Residential
AM(D)2	A1-2	Ha Pak Nai	Residential
AM(D)3	A1-3	Ha Pak Nai	Residential
AM(D)5a	A4-1	Lung Kwu Sheung Tan	Place of Worship
AM(D)6a	A3-1	Rooftop of T·Park workshop	Office
AM(D)7a	A5-2	Site boundary of Middle Tsang Tsui Ash Lagoon	Community

3.3.3 The status and locations of dust sensitive receivers may change from time to time. If such cases exist, the ET Leader shall propose updated monitoring locations and seek approval from SM and IEC and agreement from EPD on the proposal.

3.4 MONITORING EQUIPMENT

1-hour TSP

3.4.1 Portable direct reading dust meters brand named "Sibata LD-5R Laser Dust monitor Particle Mass Profiler & Counter", "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" and "Sidepak Personal Aerosol Monitor AM510" were used to 1-hour TSP measurement. These portable direct reading dust meters provided a real time 1-hour TSP measurement based on 90° light scattering.

3.4.2 The portable direct reading dust meters were used within the valid period following manufacturer's Operation and Service Manual. It was calibrated annually and determined periodically by the calibrated High-Volume Sampler to check the validity and accuracy of the results measured by direct reading method. The proposed use of portable direct reading dust meters was submitted to the IEC and obtained agreement and stated in ***Section 4.3*** of the Updated EM&A Manual.

3.4.3 The portable direct reading dust meters used for impact air quality monitoring are listed in ***Table 3-2***. The copies of calibration certificates for 1-hour TSP air quality monitoring equipment are shown in the corresponding EM&A Reports.

Table 3-2 1-hour TSP Air Quality Monitoring Equipment

Equipment	Model	Serial No.
Portable Dust Meter of Particle Mass Profiler & Counter	Sidepak Personal Aerosol Monitor AM510	11008060 (AUES Equipment No. EQ101)
	Sibata LD-3B Laser Dust monitor	2X6145 (AUES Equipment No. EQ105)
		366407 (AUES Equipment No. EQ107)
		366418 (AUES Equipment No. EQ108)
		366410 (AUES Equipment No. EQ110)
		456621 (AUES Equipment No. EQ118)
	Sibata LD-5R Laser Dust monitor	467389 (AUES Equipment No. EQ125)
		467390 (AUES Equipment No. EQ126)

24-hour TSP

3.4.4 The 24-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*. The filter paper of 24-hour TSP measurement shall be provided and determined

by HOKLAS accredited laboratory. Equipment used for 24- hour TSP of impact air quality monitoring is listed in ***Table 3-3***.

Table 3-3 24-hour TSP Air Quality Monitoring Equipment

Equipment	Model
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A

3.4.5 The equipment used for 24-hour TSP measurement is a 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 High Volume Sampler (HVS) consists of the following:
(i) An anodized aluminum shelter;
(ii) A 8”x10” stainless steel filter holder;
(iii) A blower motor assembly;
(iv) A continuous flow/pressure recorder;
(v) A motor speed-voltage control/elapsed time indicator;
(vi) A 7-day mechanical timer, and
(vii) A power supply of 220v/50 Hz

3.4.6 Prior to the 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer’s instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5028A). Valid calibration certificate of the calibration kit with the certificate of HVS calibrated are attached in the corresponding EM&A Reports.

Wind Data Monitoring Equipment

3.4.7 In consideration of the safety concerns of setting up wind sensor at 10m above ground, the ETL proposed alternative method to obtain representative wind data. Meteorological information as extracted from “the Hong Kong Observatory Lau Fau Shan Station” is alternative method to obtain representative wind data. Lau Fu Shan Station is located nearby the Project site. Moreover, Lau Fau Shan station is located at 31m above mean sea level which in compliance with the general setting up requirement. This station can also provide other meteorological information include air temperature, relative humidity, wind direction, wind speed and mean sea level pressure. Adoption of meteorological information from Hong Kong Observatory is a common alternative method for a lot of EM&A projects in Hong Kong.

3.5 MONITORING PROCEDURES

1-hour TSP

3.5.1 The portable direct reading dust meters brand named “Sibata LD-5R Laser Dust monitor Particle Mass Profiler & Counter”, “Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter” and “Sidepak Personal Aerosol Monitor AM510” was used for impact monitoring. It is a portable, battery-operated laser photometer and provides a real time 1-hour TSP measurement based on 90^0 light scattering.

3.5.2 The 1-hour TSP meter used is within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter was follow manufacturer’s Operation and Service Manual.

24- hour TSP

3.5.3 Prior of 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The 24-hour TSP Monitoring using the HVS was also processed in accordance with the manufacturer's Operations Manual.

3.5.4 A filter paper of 24- hour TSP on filters of HVS collected by the ET would be delivered to ALS Technichem (HK) Pty Ltd (ALS) carry out quantifies. Also, ALS will keeps all the sampled 24-hour TSP filter papers in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25ºC, for six months prior to disposal.

3.6 ACTION/LIMIT LEVELS FOR AIR QUALITY

3.6.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. Following the guidelines for establishing the Action and Limit Levels for air quality monitoring, the Action and Limit Levels are presented in ***Table 3-4***. 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.***

Table 3-4 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	1-hour TSP		24-hour TSP	
	Action Level (μg /m^3)	Limit Level (μg /m^3)	Action Level (μg /m^3)	Limit Level (μg /m^3)
AM(D)1	317	500	155	260
AM(D)2	313	500	156	260
AM(D)3	334	500	155	260
AM(D)5a	371	500	238	260
AM(D)6a	294	500	159	260
AM(D)7a	331	500	215	260

3.7 AIR QUALITY MONITORING RESULTS

3.7.1 The monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarized in the following sub-sections.

3.7.2 In the Reporting Quarter, 1-hour and 24-hour TSP monitoring were carried out at all monitoring stations. The monitoring results in the Reporting Quarter are summarized in ***Tables 3-5 and Table 3-6***. Graphical plots of trends in monitored parameters over the past three months are shown in ***Appendix H***.

Table 3-5 Summary of 1-hour TSP Monitoring Results

1-hour TSP (μg/m^3)				
Monitoring Station	Average (Range)	No. of Event	Action Level	Limit Level
AM(D)1 - Village house at Ha Pak Nai	58 (28 – 99)	93	317	500
AM(D)2 - Village house at Ha Pak Nai	60 (21 – 165)	93	313	500
AM(D)3 - Village house at Ha Pak Nai	63 (25 – 106)	93	334	500
AM(D)5a - Lung Kwu Sheung Tan	121 (33 – 263)	93	371	500
AM(D)6a - Rooftop of T·Park Workshop	68 (21 – 124)	93	294	500
AM(D)7a - Site boundary of Middle Tsang Tsui Ash Lagoon	110 (29 – 255)	93	331	500

Table 3-6 Summary of 24-hour TSP Monitoring Results

24-hour TSP (μg/m³)				
Monitoring Station	**Average (Range)**	**No. of Event**	**Action Level**	**Limit Level**
AM(D)1 - Village house at Ha Pak Nai	45 (14 – 91)	31	155	260
AM(D)2 - Village house at Ha Pak Nai	42 (17 – 91)	31	156	260
AM(D)3 - Village house at Ha Pak Nai	51 (10 – 109)	31	155	260
AM(D)5a - Lung Kwu Sheung Tan	140 (14 – 232)	31	238	260
AM(D)6a - Rooftop of T·Park Workshop	62 (22 – 128)	31	159	260
AM(D)7a - Site boundary of Middle Tsang Tsui Ash Lagoon	118 (15 – 206)	31	215	260

3.7.3 In the Reporting Quarter, all the 1-hour and 24-hour TSP monitoring results were below the Action/Limit Levels and no corrective action was therefore required.

4 CONSTRUCTION NOISE MONITORING

4.1 MONITORING REQUIREMENTS

4.1.1 Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq30min}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, L_{eq5min} shall be employed for comparison with the Noise Control Ordinance (NCO) criteria. As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

4.1.2 In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Event and Action Plan shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

4.2 MONITORING PARAMETER, FREQUENCY AND DURATION

4.2.1 During normal construction working hour (0700-1900 Monday to Saturday), monitoring of $L_{eq30min}$ noise levels (as 6 consecutive L_{eq5min} readings) shall be carried out at the designated monitoring location NM1- Ha Pak Nai once every week.

4.3 MONITORING LOCATIONS

4.3.1 According to the updated EM&A Manual, the ET shall carry out noise monitoring during the construction phase at the designated monitoring station as shown in ***Table 4-1*** and illustrated in ***Appendix D***.

Table 4-1 Construction Noise Monitoring Station

Monitoring ID	EIA NSR Ref	Location	Type of Monitoring	Monitoring Parameters	Supplementary Information
NM1	NSR-1	Village house at Ha Pak Nai	Construction & Operation	30mins and or 5mins of L_{Aeq}	L_{A10} and L_{A90}

4.4 MONITORING EQUIPMENT

4.4.1 As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications were used for carrying out the noise monitoring. Immediately prior to and following each noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements would be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.

4.4.2 Noise measurements were made in accordance with standard acoustical principles and practices in relation to weather conditions. Weather information such as wind speed and wind direction would be extracted from Lau Fau Shan weather station during the impact monitoring.

4.4.3 The ET was responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. Sufficient noise measuring equipment and associated instrumentation are available for carrying out the impact monitoring. The equipment and associated instrumentation have been clearly labelled.

4.4.4 Noise monitoring equipment used for impact monitoring is listed in ***Table 4-2***.

Table 4-2 Noise Monitoring Equipment

Equipment	Model	Serial No.
Integrating Sound Level Meter	Rion NL-52 / B&K2238	00921191 / 2285722
Calibrator	Rion NC-74 / B&K 4231	34657231 / 2713428

4.4.5 Sound level meter listed above comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), which was used for impact noise monitoring. The copies of calibration certificates of noise monitoring equipment were shown in corresponding EM&A Reports.

4.5 MONITORING PROCEDURES

4.5.1 The microphone of the sound level meter was set at a height of about 1.5m subject to site condition and oriented pointed to the site, with the microphone facing perpendicular to the line of sight. Moreover, the microphone was positioned away from any reflective surface, and a correction of +3 dB(A) has been made for the free field measurements.

4.5.2 Prior to the noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The calibration level from before and after the noise measurement agrees to within 1.0dB.

4.5.3 Leq_{30min} shall be taken as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. After the measurement, the data were recorded and stored automatically within the sound level meter system. At the end of the monitoring period, noise levels in term of L_{eq}, L_{90} and L_{10} were recorded.

4.5.4 All the monitoring data stored in the sound level meter system were downloaded through the computer software, and all these data were checked and reviewed on computer.

4.6 ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE

4.6.1 Following the guidelines for establishing the Action and Limit Levels for construction noise monitoring, the Action and Limit Levels are presented in ***Table 4-3***. 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***

Table 4-3 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1	When one or more documented complaints are received	75 dB(A)
Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.		

4.7 NOISE MONITORING RESULTS

4.7.1 The monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarized in the following sub-sections.

4.7.2 In the Reporting Quarter, ***14*** sessions of noise measurements were carried out at designated monitoring station NM1. The noise monitoring results in the Reporting Quarter are summarized in ***Table 4-4.*** Graphical plots of trends in monitored parameters over the past

three months are shown in ***Appendix H***.

Table 4-4 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Station ID	**Description of location**	**Range**	**No. of Event**	**Action Level**	**Limit Level**
NM1	Village house at Ha Pak Nai	49 - 58	14	When one documented complaint is received at anytime during the construction period	75

Remarks

(*) *Noise measurements was conducted at free field condition and façade correction (+3 dB(A) was added according to acoustical principles and EPD guidelines*

4.7.3 As shown in ***Table 4-4***, no construction noise measurement results triggered the Limit Level (75 dB(A)) in the Reporting Quarter. Due to the construction programme, construction works during restricted hour was commenced from 15 November 2024. According to site inspection and auditing on Contractor's record have shown that the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority for construction works during restricted hours were followed. Thus, the stipulated requirement on noise impact control during restricted hour was achieved.

4.7.4 Furthermore, no valid noise complaint (which triggered Action Level exceedance) was recorded in the Reporting Quarter.

5 WATER QUALITY MONITORING

5.1 MONITORING REQUIREMENTS

5.1.1 According to the updated EM&A Manual, the Contractor shall carry out surface water monitoring from the commencement of the works until the issue of the Aftercare Certificate.

5.1.2 According to general water quality monitoring criteria, water sampling depth should be:

- If the water depth during sampling is exceeded 6m, three depths: 1m below water surface, 1m above river/stream bed and mid-depth.
- If the water depth during sampling is exceeded 3m but less than 6m, two depths: 1m below water surface and 1m above river/stream bed.
- If the water depth is less than 3m, one depth: perform at mid-depth.

5.1.3 Duplicate samples and repeat in-situ measurement shall be taken from each sampling depth.

5.2 MONITORING FREQUENCY AND DURATION

5.2.1 During the construction phase, monthly monitoring of the surface water discharges shall be carried out in order to show if contamination of surface water by leachate is occurring.

5.3 MONITORING LOCATIONS

5.3.1 The surface water monitoring should be carried out at the specified point WM1 in accordance with Figure 5.1 in the updated EM&A Manual, which is shown in ***Appendix D***, unless otherwise agreed by IEC and approved by the SM.

5.4 ANALYSIS PARAMETERS

5.4.1 According to Section 5.5 of the updated EM&A Manual, the parameters of surface water monitoring included in-situ measurement and laboratory analysis are listed below.

A. *In-situ measurement:*
Temperature (°C), pH (unit), Salinity (ppt), Turbidity (NTU), Dissolved Oxygen (DO) (mg/L) & Dissolved Oxygen Saturation (DOS) (%), Electrical Conductivity (µS/cm), Water Flow direction (degree) / speed (m/s) and Water depth (m).

B. *Laboratory Analysis (mg/L):*
Alkalinity, Chemical Oxygen Demand (COD), 5-day Biochemical Oxygen Demand (BOD_5), Total Organic Carbon (TOC), Suspended Solids (SS), Ammonia Nitrogen (NH_3-N), Total kjeldahl nitrogen, Nitrate (NO_3), Sulphate & Sulphite, Phosphate, Chloride and Oil & Grease.

C. *Laboratory Analysis:*
Sodium (µg/L) and Coliform Count (cfu/100mL).

D. *Heavy Metals Analysis(µg/L):*
Magnesium (Mg), Calcium (Ca), Potassium (K), Iron (Fe), Nickel (Ni), Zinc (Zn), Manganese (Mn), Copper (Cu), Lead (Pb) and Cadmium (Cd).

5.5 MONITORING EQUIPMENT

5.5.1 Water quality monitoring equipment used for impact monitoring is listed in ***Table 5-1.***

Table 5-1 Surface Water Monitoring Instrument

Equipment	Model	Serial No.
A Digital Global Positioning System	Garmin eTrex	N/A
Thermometer & DO	YSI Professional DSS	[20J101862/ 15H103928]/

Equipment	Model	Serial No.
meter	Multifunctional Meter	[EQW018] and [17B102764/17B100758]/ [EQW019]
pH meter		
Turbidimeter		
Salinometer		
Conductivity meter		
Current Meter	Valeport Model 106 Current Meter	[60011]
Sample Container	High density polythene bottles provided by laboratory	N/A
Storage Container	'Willow' 33-liter plastic cool box with ice pad	N/A

5.5.2 All in-situ measurement instruments such as DO measuring instruments, turbidity measuring instruments, salinometer and A portable pH meter, would be calibrated by HOKLAS accredited laboratory at three-month intervals. Valid calibration certificate is attached in corresponding EM&A Reports.

5.6 LABORATORY ANALYSIS

5.6.1 A local HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration number: HOKLAS 066) was appointed as a testing laboratory to carry out chemical analytical. The HOKLAS accredited certificate of laboratory is shown in corresponding EM&A Reports. The determination was started within 24 hours or recommended hold time of collection of water samples. The method of chemicals analysis is shown below ***Table 5-2***.

Table 5-2 Test Method and Reporting Limit of Chemicals Analysis

Analyte Description	ALS Method Code	Method Reference	Limit of Reporting (LOR)
pH value @25°C	EA002	APHA 4500 H: B	0.1 pH Unit
Conductivity @25°C	EA010	APHA 2510 B	1µS/cm
Suspended Solids	EA025-LL**	APHA 2540 D	0.1mg/L
Total Alkalinity as $CaCO_3$	ED037	APHA 4500 H: B	1mg/L
Sulphate as SO_4	ED041K	USEPA 375.4	1mg/L
Chloride	ED045K	USEPA 325.1	0.5mg/L
Cadmium Copper Lead Manganese Nickel Zinc	EG020 T	USEPA 6020	0.2µg/L 1µg/L 1µg/L 1µg/L 1µg/L 10µg/L
Calcium Iron Magnesium Potassium Sodium	EG032 T	USEPA 6010	50µg/L 10µg/L 50µg/L 50µg/L 50µg/L
Ammonia as N	EK055K	APHA 4500 NH3 G	0.01mg/L
Nitrate as N	EK058A	APHA 4500 NO3: I	0.01mg/L
Total Kjeldahl Nitrogen as N	EK061A	APHA 4500 Norg: D; USEPA 1688	0.1mg/L
Reactive Phosphorus as P	EK071K	APHA 4500 P: B & F	0.01mg/L

Analyte Description	ALS Method Code	Method Reference	Limit of Reporting (LOR)
Sulphite as SO_3^{2-}	EK086 **	APHA 4500 SO3: B	2mg/L
Total Organic Carbon	EP005	APHA 5310 B	1mg/L
Oil and Grease	EP020	APHA 5520 B	5mg/L
Chemical Oxygen Demand (COD) (Closed Reflux method)	EP026C	APHA 5220 C	5mg/L
Biochemical Oxygen Demand (BOD)	EP030	APHA 5210 B	2mg/L
Total Coliforms	EM003	DoE section 7.8, 7.9.4.1 & 3	1 CFU/100mL

*Remarks: Except ** Item, all the methods as quoted is HOKLAS accredited*

5.7 MONITORING PROCEDURES

5.7.1 Prior to conducting in-situ measurement and water sampling, general information such as the sampling date, time, weather conditions and the personnel responsible for the monitoring would be recorded on the field data sheet. The location of water quality monitoring station was confirmed using GPS prior to in-situ monitoring and sampling. Moreover, the water depth at the monitoring station will be measured using a portable digital global positioning system.

5.7.2 In order to collect sufficient impact data, surface water monitoring will be conducted at two specific tide points: one mid-ebb and one mid-flood.

5.7.3 Before the surface water sampling, water flow and distance would be measured by Valeport Current Meter. Moreover, water temperature, DO & DOs, pH, salinity, conductivity and turbidity were taken by YSI Professional DSS Multifunctional Meter. These measurement results would be downloaded from instruments and recorded.

5.7.4 As the water depth was less than 3m, in-situ measurement and water sampling was conducted at mid-depth only. Water samples were collected repeatedly using the water sampler to obtain adequate water volumes for laboratory analysis. All the obtained water volumes would be directly filling into sample container as provided by the testing laboratory. Also, sample container would be pre-labeled with date, location, tide, depth, parameters and replicate information of the sample. The water sampler would be rinsed using local marine water before it used to collect marine water sample. Container is sealed with a screw cap after completed water filling then packed in cool box (maintain 4°C without being frozen) and delivered to the laboratory on the same day of sample collection for analysis. Also, the water sample filled into container until no remaining air space and then the lid securely screwed on. Where samples are to be preserved with acid or alkalis prior to transport to the laboratory, the sample bottles would be filled to the specified level which advised by the testing laboratory.

5.7.5 Before each round of monitoring, the dissolved oxygen probe would be calibrated by wet bulb method; a zero check in distilled water would be performed with the turbidity and salinity probes; 4 and 10 values of the standard solution would be undertaken to check the accuracy of pH value.

5.7.6 Additionally, the laboratory will retain all water samples after analysis for a period of 3 months, allowing for the possibility of repeat analysis if needed.

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

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

5.8.2 For monitoring parameters that require laboratory analysis, the testing laboratory would be according with the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

Action/Limit Levels for Surface Water Quality

5.8.3 Following above guidelines for establishing the Action and Limit Levels for surface water quality monitoring, the Action and Limit Levels of the Project are presented in ***Table 5-3***.

Table 5-3 Action and Limit Levels for Surface Water Monitoring during Construction Phase

Monitoring Parameter	Action Level	Limit Level
DO mg L^{-1}	6.4	4.0
pH, (unit)	Beyond the range of 6.5 to 8.5	Beyond the range of 6 to 9
Turbidity, NTU	23.4	34.1
SS, mg L^{-1}	47.3	50.0

5.9 RESULTS OF SURFACE WATER QUALITY MONITORING

5.9.1 The monitoring schedule is presented in ***Appendix G*** and the monitoring results are summarized in the below sections.

5.9.2 Surface water quality monitoring was carried out at the designated monitoring station WM1 on monthly basis, which were on 7th October 2024, 7th November 2024 and 5th December 2024. As the water depth at WM1 was less than 3m, in-situ measurement and water sample collection were conducted at mid-depth.

5.9.3 There are no exceedances recorded for surface water monitoring. Graphical plots of trends in monitored parameters over the past three months are shown in ***Appendix H***.

6 ECOLOGY MONITORING

6.1 REQUIREMENTS

6.1.1 The EIA stipulated that ecological monitoring should be undertaken throughout the design, construction, operation, restoration and aftercare phases of WENT Landfill Extension to ensure that all mitigation measures should be fully complied with. The objectives of design audit for ecology are to ensure that the design for ecological mitigation specified in the EIA Report will be conducted to ensure that such designs are ecologically feasible and effective.

6.1.2 The performance of monitoring and audit from an ecological prospective should be integrated with the overall monitoring and audit plan for the project as a whole. The information on the commencement and programme of the engineering works should enable the ecological monitoring to be prepared with considerations of seasonality factors. An EMIS of the recommended mitigation measures is presented in ***Appendix* K**

6.2 ECOLOGICAL MITIGATION MEASURES

6.2.1 Ecological mitigation measures to be implemented before commencement of relevant construction phase should include survey and transplantation of plant species of conservation interest and setting up water quality monitoring stations inside Tai Shui Hang catchment to monitor the conditions of the habitat for the rare freshwater fish, *Acrossocheilus parallens*. In addition, although potential impacts to stream loss and fish species of conservation interest are ranked as minor and insignificant and no mitigation is required, a precautionary measure – fish capture and translocation survey for the three fish species of conservation interest including *Squaliobarbus curriculus, Osteochilus vittatus* and *Kuhlia marginata* will also be implemented before site clearance.

6.3 MONITORING AND AUDIT FOR ECOLOGY

6.3.1 The ecological monitoring and audit programme in relation to construction phase would be survey and transplantation of the plant species of conservation interest and 2 years of monitoring after.

6.3.2 According to the EIA Report, four plant species of conservation interest were found and directly impacted by the WENT Landfill Extension in June 2009. However, during the latest field survey in January 2024, only three groups of *Nepenthes mirabilis* (Pitcher Plant) could be found, and the remaining mentioned plants were not located. For *Ixonanthes reticulata* recorded at Tsang Kok Stream from the VEP were not found during the survey in January 2024. If *Ixonanthes reticulata* is found in the future, further assessment will be carried out to review the feasibility of transplantation.

6.3.3 Upon completion of transplantation, monitoring should be implemented for 2 years. The health and condition of individuals of the transplanted plant species of conservation interest should be monitored during the first 2 years after transplantation. Monitoring should be conducted monthly during first 6 months, and bi-monthly in the next 18 month to ensure survival. Since die-back of current year's growth is not uncommon, new stems, leaves and/or flowers produced from the cuttings in the following years, if observed in the following season, should be marked separately but also counted as survived individuals.

6.3.4 Monitoring of transplanted species will be carried out after the transplantation work. No monitoring is required in the Reporting Quarter.

7 LANDSCAPE AND VISUAL MONITORING

7.1 MONITORING REQUIREMENTS

7.1.1 The EIA study has recommended landscape and visual mitigation measures to be undertaken during the construction and operation phases, as well as the restoration and aftercare phases of the project. Compared with the approved WENTX EIA, two new visual sensitive receivers (VSRs) within the visual envelop from the boundary of the Project are identified. Other VSRs are the same as the EIA. This section outlines the EM&A requirements of these measures to mitigate the landscape and visual impacts. An EMIS of the recommended mitigation measures is presented in ***Appendix K.***

7.1.2 Measures to mitigate the landscape and visual impacts during the construction and operation phases should be checked to ensure compliance with the intended aims of the measures. The progress of the engineering works should be regularly reviewed on site to identify the earliest practical opportunities for the landscape works to be undertaken. The event and action plan for landscape and visual monitoring during the construction phase is summarised in ***Appendix F***.

7.2 MONITORING AND OBSERVATION

7.2.1 In order to monitor the landscape and visual impact after providing mitigation measures effectively, all the specified and affected landscape character areas, landscape resources and visually sensitive receivers should be monitored. Implementation of mitigation measures during construction phase of the Project has been monitored through regular site inspection/ audit.

8 LANDFILL GAS MONITORING

8.1 REQUIREMENT

8.1.1 Landfill gas (LFG) monitoring should commence at the start of specific construction works, such as excavation and drilling for blasting, and through the operation, restoration and until completion of aftercare phases. The measured LFG results should be checked for compliance against pre-defined A/L Levels in this EM&A Manual. In case exceedance of compliance level was detected at any locations, the EAP should be triggered for necessary action to be taken.

8.2 MONITORING PARAMETERS

A suite of LFG monitoring parameters include:

Monitoring Method	Monitoring Parameters	Requirement of Monitoring
• Monitoring borehole:	Methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), flammable gas	If the blasting works are within the 250m consultation zone of WENT Landfill, gas monitoring shall be conducted at the nearest monitoring boreholes(#).
• Surface gas location:	CH_4, CO_2, O_2	For excavation works between 300mm and 1m deep and deeper than 1m; and throughout the whole process of the blasting
• Gas well head:	CH_4, CO_2, O_2, flammable gas, volatile organic compounds (VOC)	Once the gas well(#) is set up
• Off-site location:	VOC	Once WENTX starts receiving waste

Remark: (#) Monitoring boreholes will be installed for LFG monitoring at the borehole and gas well head. The programme for borehole installation will be synchronized with the construction programme.

8.2.1 The existing WENT Landfill is required to conduct LFG monitoring during landfill operation from drillholes, boreholes, gas probes and piezometers around the perimeter of the Site as specified in their contract. Before setting up the monitoring boreholes for WENTX, the Contractor should refer to the monitoring data collected from the existing WENT Landfill. This data serves as a reference and provides valuable information regarding historical gas levels and trends at the site.

8.3 MONITORING EQUIPMENT

Monitoring for Construction Works

8.3.1 Intrinsically safe portable gas detectors should be used during excavation or when working in any confined spaces, which have the potential for presence of LFG and risk of explosion or asphyxiation. The monitoring equipment should alarm, both audibly and visually, when the concentrations of the following gases were exceeded:

- CH_4: > 10% of the Lower Explosion Limit (LEL);
- CO_2: > 0.5% by volume; and
- O_2: < 19% by volume

Calibration and Maintenance

8.3.2 All portable instrument should be calibrated and serviced according to the manufacturer's instructions. Calibration gases should be used for checking portable instrument for methane

and carbon dioxide detection before and after use. Instrument for monitoring oxygen should be calibrated against normal expected air concentrations. Any significant variations in instrument performance outside that expected through normal drift should be noted with the instrument calibration timely corrected.

8.3.3 Gas analyser was used for carrying out LFG monitoring for Construction Works. **Table 8-1** summarises the equipment that were used in the LFG monitoring programme and the calibration certificates are shown in the corresponding EM&A Reports.

Table 8-1 LFG Monitoring Equipment

Monitoring Parameter	Equipment	Model	Serial No.
CH_4, CO_2 & O_2	Gas Analyser	SKY3000-R5	02100C44A2002
		GA5000	G510348

8.4 MONITORING LOCATIONS

8.4.1 During the construction stage, when excavation of 1m deep or more, surface LFG concentrations should be monitored at before entry and periodically during the progress of works.

8.4.2 The blasting work is scheduled to be carried out in 6 Phases and during Phase 1, the Contractor will utilise the existing WENT's monitoring wells for carrying out landfill gas monitoring as the WENTX landfill gas monitoring boreholes have yet to be completed. However, the Contractor is committed to complete the proposed landfill gas monitoring boreholes along the WENTX waste boundary for both Phase 1 and 2 blasting areas while Phase 1 blasting work is being carried out and so on for subsequent phases. In other words, when the blasting work is completed for Phase 1, the landfill gas monitoring boreholes for subsequent phase (i.e. Phase 2) is also complete and likewise for subsequent Phases. After Phase 1 blasting work is completed, WENT's monitoring wells will no longer be needed as the next phase proposed monitoring wells would have already been constructed. The landfill gas monitoring will be carried out in accordance with the requirement either within 250m consultation zone of the WENT Landfill or within 250m from the waste boundary of the WENT landfill extension site.

8.5 MONITORING FREQUENCY

8.5.1 The monitoring frequency and areas to be monitored should be set down prior to commencement of groundworks either by the Registered Safety Officer or by an appropriately qualified person. Routine monitoring should be carried out the in slope cutting by blasting, in all excavations, manholes and chambers and any other confined spaces that may have been created by, for example, the temporary storage of building materials on the site surface. All measurements in excavations should be made with the monitoring tube located not more than 10mm from the exposed ground surface.

8.5.2 The Contractor will maintain close liaison with WENT Landfill operator on a weekly basis and provide a two weeks tentative blast schedule at least 1 week before the blasting work. The tentative blast schedule will include the schedule blast date, location of blast works and the approximate separation distance between the blast area and existing WENT Landfill boundary.

8.5.3 The frequency and the locations of the LFG monitoring within the excavation area should be determined prior to commencement of the blasting works. The monitoring requirements and procedures specified in *Paragraphs 8.23 to 8.28 of the EPD's Landfill Gas Hazard Assessment*

Guidance Note shall be strictly followed.

A. *For blasting works on existing slope*

The Contractor will perform landfill gas monitoring for all blasting works within the 250m consultation zone of the WENT Landfill (i.e. plan distance from the edge of the existing waste boundary of WENT Landfill site) at the schedule below.

- The Contractor will inform WENT Landfill operator about the selected perimeter monitoring wells along WENT's landfill boundary for landfill gas monitoring that may be required. When existing WENT's monitoring wells are proposed, permission from WENT's Landfill operator must be obtained.
- The Contractor will carry out landfill gas monitoring at the nearest monitoring wells (within 250m from WENT boundary) and the results shall be reported to the Service Manager. If the methane concentration is measured and remained to be less than 1%, drilling of blast holes can be proceeded after receiving confirmation from the Service Manager.
- Drilling of blast holes will take multiple days, thus, landfill gas monitoring shall be carried out every morning at the nearest blast hole following the same procedure as mentioned above prior to resume drilling work.

i) Surface Emission Monitoring

- a walkover survey for surface gas emission to be undertaken within the blasting area, with a portable gas measuring probe to detect the air condition at about 10 millimeters above the ground level to ensure no LFG is present.

B. *For excavation works deeper than 1m*

i) Measurements should be made:

- at ground surface before excavation work commences;
- immediately before any worker enters the excavation;
- at the beginning of each working day for the entire period the excavation remains open; and
- periodically through the working day whilst workers are in the excavation.

C. *For excavation between 300mm and 1m deep*

i) Measurements should be made:

- directly after the excavation has been completed; and
- periodically whilst the excavation remains open.

8.5.4 For excavations less than 300mm deep, monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person.

8.5.5 During the construction (specific construction works) operation, restoration and until completion of aftercare phases, LFG monitoring should be conducted in monthly basis at designated monitoring locations and gas monitoring boreholes, supplemented by monthly site surveys of the surrounding environment including natural cracks and fissures, service drains and ducts, area with sign of vegetation death, and any below ground enclosed spaces.
If the monitoring results indicate evidence of gas migration, the monitoring frequency should be increased accordingly, with the implementation of appropriate mitigation measures under the EAP.

8.5.6 The monitoring frequency should be reviewed throughout the on-going development of WENT Landfill Extension and revised as necessary based on the LFG monitoring data.

8.6 A/L Levels and Event Action Plan

8.6.1 The A/L Levels and relevant EAP for LFG detected in excavation, utilities and enclosed onsite areas are summarised in ***Table 8-1***.

Table 8-1 A/L Levels and EAP for LFG

Parameter	Level	Action
Oxygen (O_2)	Action Level <19% O_2	• Ventilate trench/void to restore O_2 to >19%
	Limit Level <18% O_2	• Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore O_2 to >19%
Methane (CH_4)	Action Level >10% LEL*	• Prohibit hot works • Increase ventilation to restore CH_4 to <10% LEL
	Limit Level >20% LEL	• Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore CH_4 to <10% LEL
Carbon dioxide (CO_2)	Action Level** >0.5%** CO_2	• Ventilate to restore CO_2 to < 0.5%
	Limit Level >1.5% CO_2	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore CO_2 to <0.5%

* LEL: Lower Explosive Limit – concentrations in air below which there is not enough fuel to continue an explosion.

** This Action Level of CO_2 at 0.5% is set for reference only, assuming no CO_2 emission from a particular location. Depending on the baseline CO_2 levels, the Action Level at a particular location will be changed.

8.7 Monitoring Results

8.7.1 The LFG monitoring was conducted for excavation work in October, November and December 2024. There were no exceedance of Limit Levels of LFG was recorded during the Reporting Quarter.

8.7.2 No effect that arose from the other special phenomena and work progress of the concerned site was noted during the current monitoring month.

9 WASTE MANAGEMENT

9.1 GENERAL WASTE MANAGEMENT

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

9.2 RECORDS OF WASTE QUANTITIES

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

- Inert construction & demolition (C&D) Material; and
- Non-inert C&D waste

9.2.2 The Contractors are advised to minimise the wastes generated through recycling or reusing. All mitigation measures stipulated in the updated EM&A Manual and waste management plans shall be fully implemented.

9.2.3 The quantities of waste for disposal of in this Reporting Quarter are summarized in ***Tables 9-1*** and ***9-2*** and they are made reference to the Waste Flow Table provide by the Contractor which shown in ***Appendix I***.

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

Type of Waste	Oct 24 Quantity	Nov 24 Quantity	Dec 24 Quantity
Total generated C&D Materials (Inert) (in '000m^3)	117.878*	64.119	120.593
Reused in this Contract (Inert) (in '000m^3)	86.728	55.299	84.717
Reused in other Projects (Inert) (in '000m^3)	31.150*	8.820	34.967
Disposal as Public Fill (Inert) (in '000m^3)	0	0	0.909

*Remarks: Quantity had been updated after Monthly EM&A Report for Oct 2024 was issued

Table 9-2 Summary of Quantities of Non-inert C&D Wastes

Type of Waste	Oct 24 Quantity	Nov 24 Quantity	Dec 24 Quantity
Recycled Metals (in kg)	23140	80660	0.3
Recycled Paper / Cardboard Packaging (in kg)	0	4	1.7
Recycled Plastics (in kg)	0.6	2.3	1.6
Chemical Waste (in '000kg)	0	1.2	0
Yard Waste (in tonne)	2678.7	196.550	324.590
General Refuse (in '000m^3)	0.115	0.179	0.174

10 SITE INSPECTION

10.1 REQUIREMENTS

10.1.1 According to the updated 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 QUARTER

10.2.1 In the Reporting Quarter, weekly joint site inspection to evaluate the site environmental performance had been carried out by the representatives of the Consultants, ET and the Contractor. No non-compliance was noted during the site inspection. In addition, monthly IEC carried out the joint site inspections on 10th October 2024, 15th November 2024 and 12th December 2024. No non-compliance was noted.

10.2.2 The summary of site inspection during the Report Quarter are shown in ***Table 10-1***.

Table 10-1 Site Inspection and Observations

Reporting Month	Days of Inspection	No. of Findings / Deficiencies	Status
October 2024	4th, 10th, 17th, 23rd and 31st October 2024	21 observations	All rectified
November 2024	7th, 15th, 21st and 28th November 2024	18 observations	All rectified
December 2024	5th, 12th, 19th and 24th December 2024	11 observations	All rectified

10.2.3 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 Contracts.

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 Quarter.

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

Table 11-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
3rd April – 30th September 2024	0	0	NA
1st – 31st October 2024	0	0	NA
1st – 30th November 2024	0	0	NA
1st – 31st December 2024	0	0	NA

Table 11-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
3rd April – 30th September 2024	0	0	NA
1st – 31st October 2024	0	0	NA
1st – 30th November 2024	0	0	NA
1st – 31st December 2024	0	0	NA

Table 11-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
3rd April – 30th September 2024	0	0	NA
1st – 31st October 2024	0	0	NA
1st – 30th November 2024	0	0	NA
1st – 31st December 2024	0	0	NA

11.2 OTHER ENVIRONMENTAL NON-COMPLIANCES

11.2.1 In addition, no emergency events related to violation of environmental legislation for illegal dumping and landfilling were received in the Reporting Quarter.

12 IMPLEMENTATION STATUS OF MITIGATION MEASURES

12.1 GENERAL REQUIREMENTS

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

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

12.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

12.2.1 According to information provided by the Contractor, the construction works under the Project in the next month are listed below:

Portion A1, B1a, B1c & B6
- Soft excavation
- Hard excavation
- Blasting

Portion B10
- Piling work
- Leachate Treatment Works & Landfill Gas Treatment Plant

Portion C1
- Temporary Site Office construction
- External manholes construction
- Temporary drainage diversion at nullah

Portion B2
- J-channel construction

Portion C7
- Loading and unloading pre-cast unit and construction material

Portion D1
- Pipe Laying Works

Portion B8
- Soil Nail Works

12.3 KEY ISSUES FOR THE COMING MONTH

12.3.1 Key issues for the coming month include the following:
- Implementation of control measures for rainstorm / adverse weather;
- Regular clearance of stagnant water;
- Implementation of dust suppression measures at all times;
- Implementation of permanent/temporary drainage system and control measures for the surface runoff;
- Implementation of dust suppression measures for the dry/loose/exposure soil surface/dusty material;

- Implementation of control measures to avoid disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Regular maintenance of sediment catch-pits and silt removal facilities;
- Management of chemical wastes;
- Implementation of control measures to avoid discharge of site effluent to the nearby stream;
- Implementation of waste management; and
- Implementation of construction noise preventative control measures.

13 CONCLUSIONS AND RECOMMENDATIONS

13.1 CONCLUSIONS

13.1.1 This is the **3rd** Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Project for the period from **1st October 2024 to 31st December 2024.**

13.1.2 In this Reporting Quarter, no 1-hour and 24-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 Quarter, no noise complaint (which is an Action Level exceedance) was received and no construction noise measurement result triggered the Limit Level was recorded in this Reporting Quarter. Moreover, all construction works during restricted hours were followed the CNP requirement. Therefore, no corrective action was issued.

13.1.4 In this Reporting Quarter, no surface water quality monitoring result that triggered the Action or Limit Levels was recorded. No corrective action was required.

13.1.5 The LFG monitoring was conducted for excavation and / or blasting work in October, November and December 2024. No exceedance of Limit Levels of LFG was recorded during the Reporting Quarter.

13.1.6 For landscape and visual, implementation of mitigation measures during construction phase of the Project has been monitored through regular site inspection/ audit.

13.1.7 In the Reporting Quarter, no environmental complaint, summons and prosecution was received. In addition, no emergency events related to violation of environmental legislation for illegal dumping and landfilling were received.

13.1.8 In the Reporting Quarter, weekly joint site inspection to evaluate the site environmental performance had been carried out by the representatives of the Consultants, ET and the Contractor. No non-compliance was noted during the site inspection. In addition, monthly IEC carried out the joint site inspections on 10th October 2024, 15th November 2024 and 12th December 2024. No non-compliance was noted.

13.2 RECOMMENDATIONS

13.2.1 Water quality mitigation measures shall be fully implemented in accordance with the Implementation Schedule for Environmental Mitigation Measures of the updated EM&A Manual.

13.2.2 In addition, the Contractor should fully implement the recommended air quality mitigation measures to minimize the impact of construction dust as far as practicable.

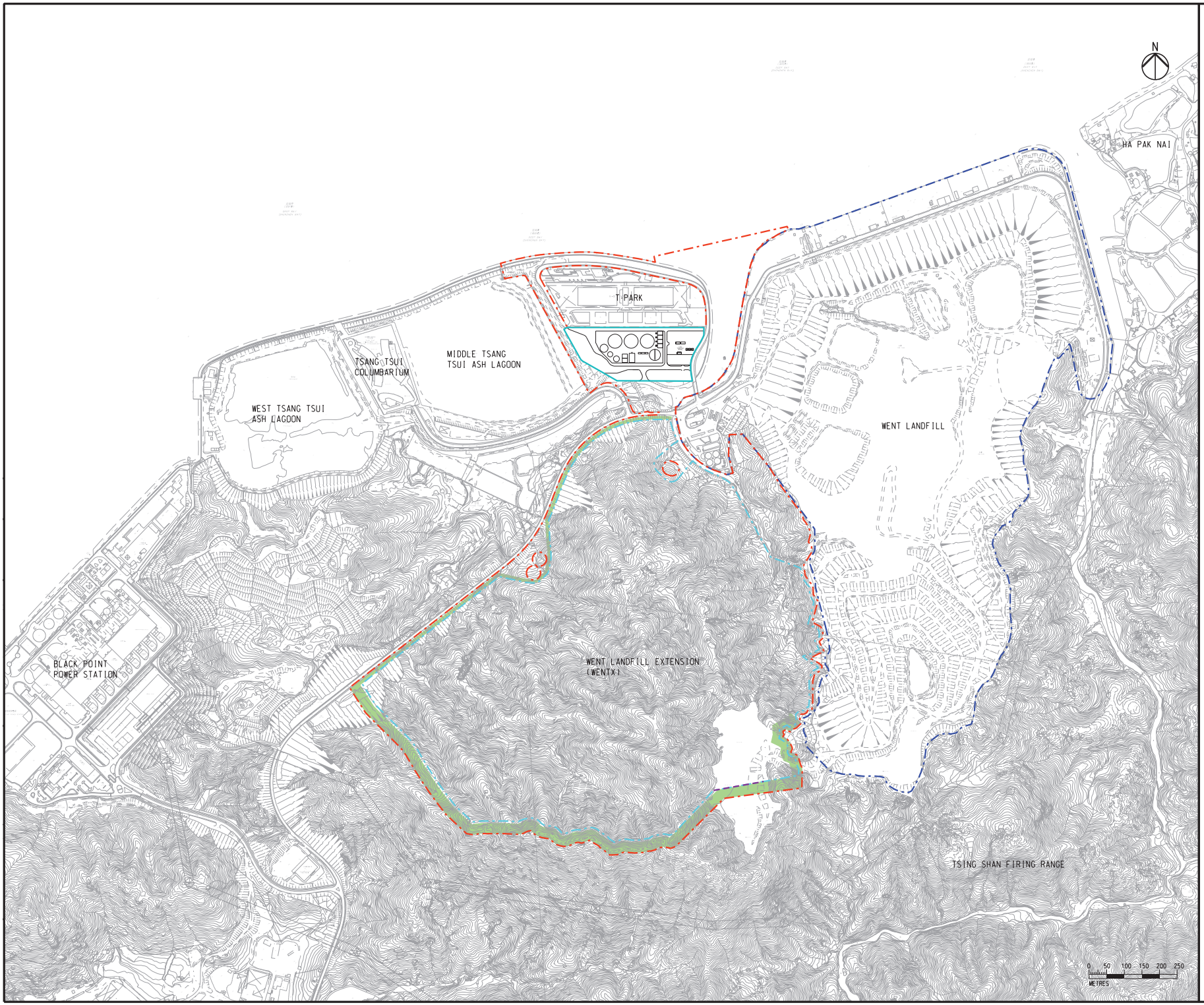
13.2.3 Construction noise would be a key environmental issue during construction work of the Project. In accordance with the EP, a noise bund of 3.5m tall has been constructed along the north eastern seafront of the existing landfill as shown in Figure 2 of the EP prior to the commencement of construction. It is reminded that the noise bund shall be properly maintained during the construction, operation and restoration of the Project.

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

Appendix A

Location Plan of Enhanced Scheme

of WENTX Landfill Extension



LEGEND

- WENT LANDFILL EXTENSION (WENTX) BOUNDARY
- WENTX WASTE BOUNDARY
- LANDFILL INFRASTRUCTURE FOR WENTX
- WENT LANDFILL BOUNDARY
- TREE PLANTING BUFFER

Project title

Contract No. EP/SP/186/21 West New Territories Landfill Extension

Drawing title

GENERAL PLAN
OF ENHANCED SCHEME

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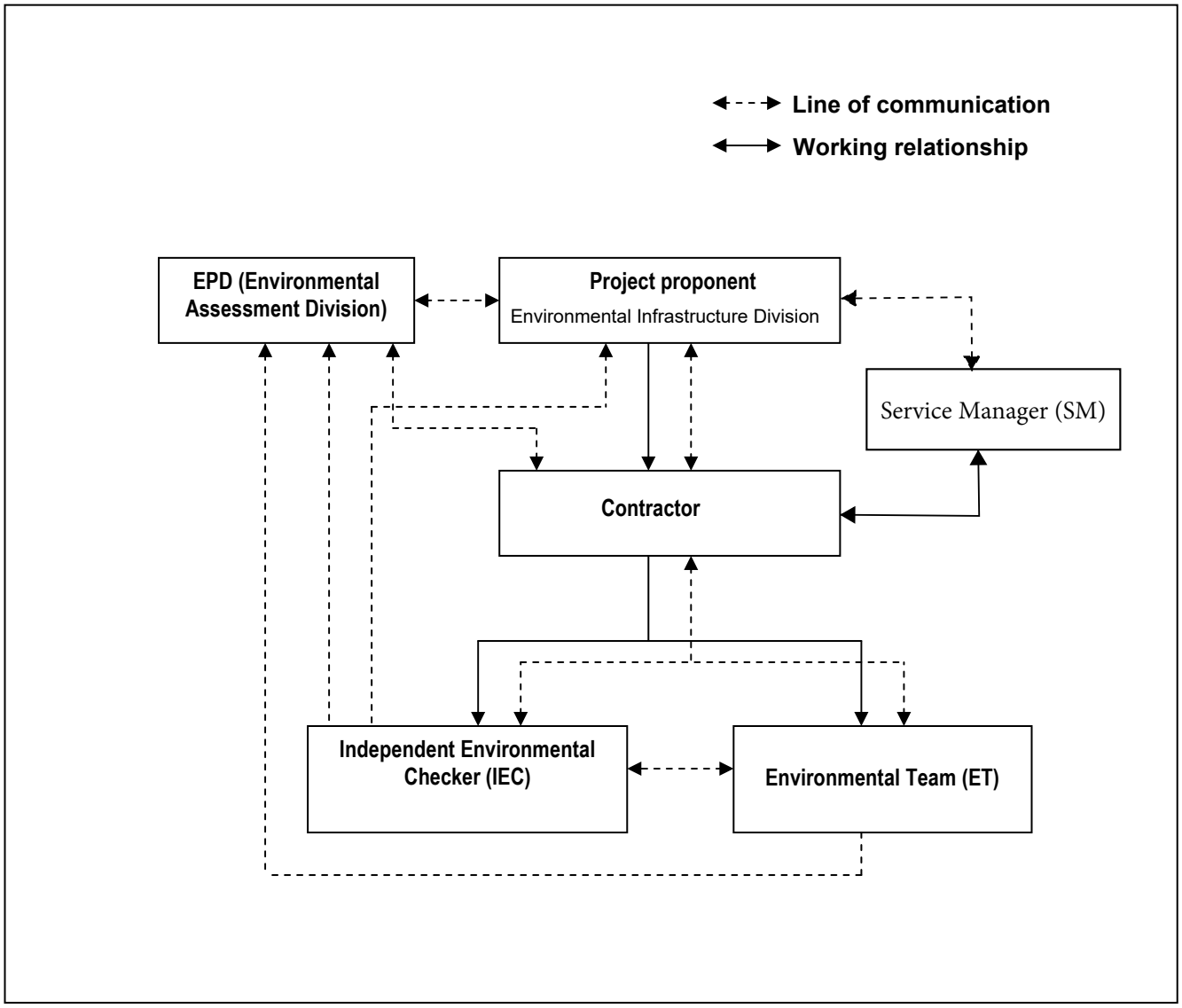
Appendix B

Project Organization and the key personal contact

Flow chart showing Line of Communication and Working Relationship



Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
HKRRP	Project Manager	Mr. Victor Wu	2862 5013	--
HKRRP	Environmental Manager	Mr. Kenneth Lau	9315 4944	--
ANEWR	Independent Environmental Checker	Mr. James Choi	2618 2831	3007 8648
AUES	Environmental Team Leader	Mr. Tam Tak Wing	2959 6059	2959 6079

Legend:

ANEWR (IEC) – ANewR Consulting Limited

AUES (ET) – Action-United Environmental Services & Consulting

HKRRP - (the Contractor) – Hong Kong Resources Recovery Park

Appendix C

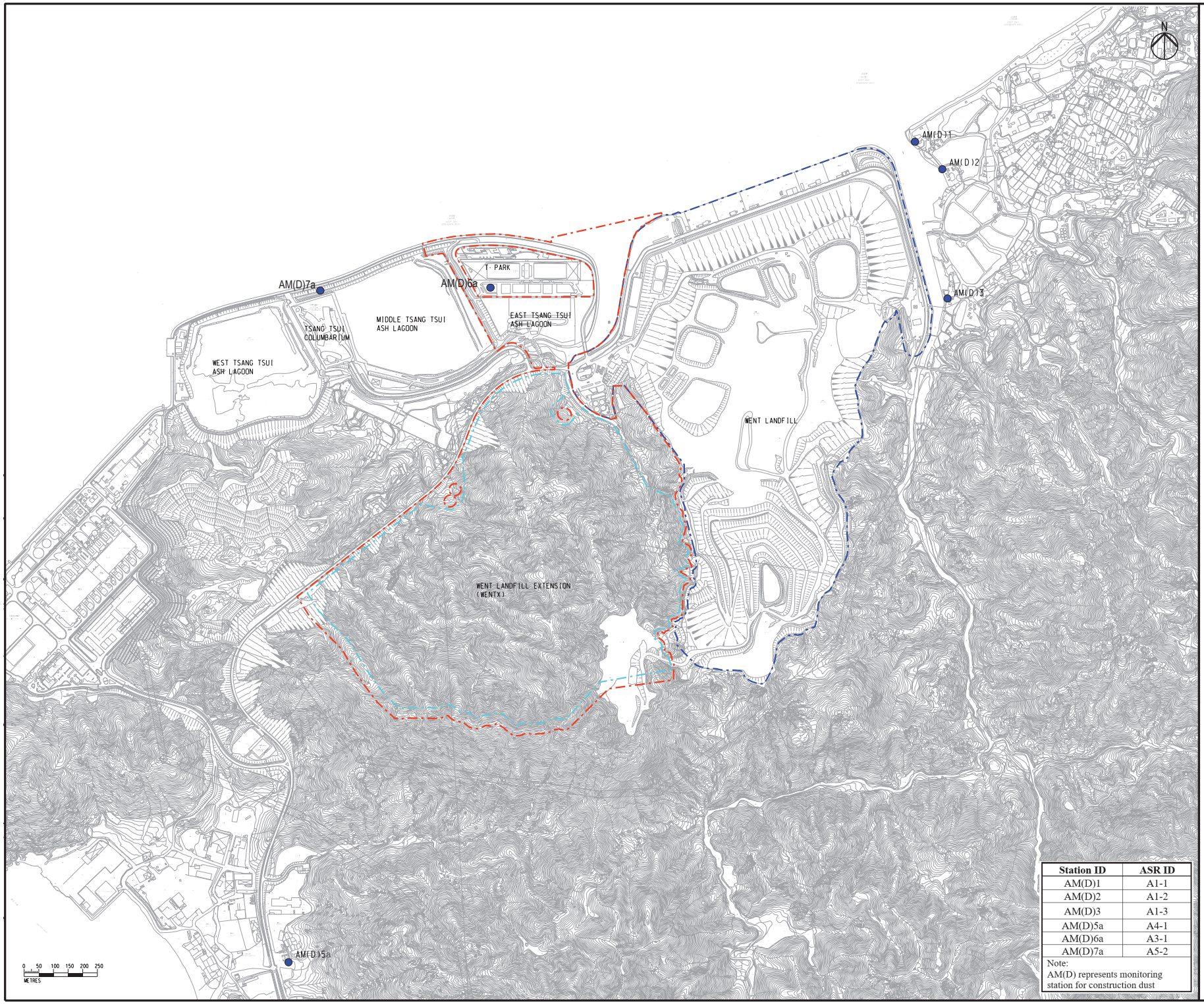
3-month Construction Programme

Construction Programme (Oct 2024 to Jan 2025)
West New Territories Landfill Extension (WENTX)

Construction Activities	2024			2025
	Oct	Nov	Dec	Jan
Ground Investigation Works				
Eastern Platform - Site Formation				
- Soft Excavation				
- Rock Excavation				
- Blasting				
Landfill Waste Filling Area (Phase I) - Site Formation				
- Soft Excavation				
- Rock Excavation				
- Blasting				
Fresh Water Pump House and Fresh Water Pipe Connection				
- Pipe Laying Works				
River Surge Box Culvert Construction				
- Box Culvert Construction				
Marine Works				
- Temporary Drainage Channel				
Leachate Treatment Works & Landfill Gas Treatment Plant				
- Foundation Works				
- Footing Construction				
Construction of Site Office				

Appendix D

Monitoring Locations



LEGEND

- WENT LANDFILL EXTENSION (WENTX) BOUNDARY
- WENTX WASTE BOUNDARY
- WENT LANDFILL BOUNDARY
- AIR QUALITY MONITORING LOCATIONS

Station ID	ASR ID
AM(D)1	A1-1
AM(D)2	A1-2
AM(D)3	A1-3
AM(D)5a	A4-1
AM(D)6a	A3-1
AM(D)7a	A5-2

Note:
AM(D) represents monitoring station for construction dust

Consultant

Project title

Contract No. EP/SP/186/21
West New Territories Landfill Extension

Drawing title

LOCATIONS OF AIR QUALITY MONITORING STATIONS

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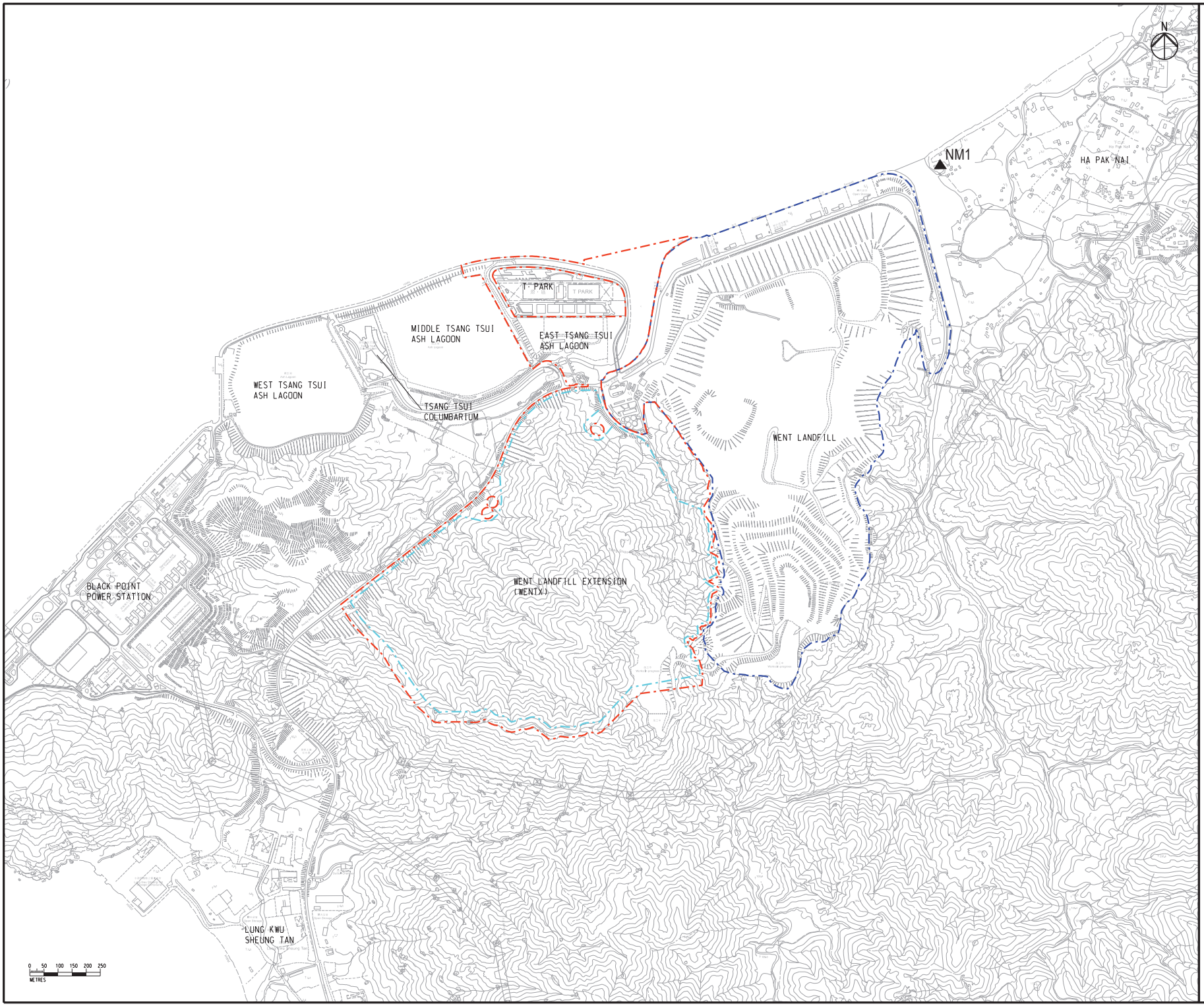

LEGEND

- WENT LANDFILL EXTENSION (WENTX) BOUNDARY
- WENTX WASTE BOUNDARY
- WENT LANDFILL BOUNDARY
- NOISE MONITORING LOCATION

Consultant

Contract No. EP/SP/186/21
West New Territories Landfill
Extension

Drawing title

NOISE MONITORING LOCATION

LEGEND

- WENT LANDFILL EXTENSION (WENTX) BOUNDARY
- WENTX WASTE BOUNDARY
- WENT LANDFILL BOUNDARY
- SURFACE WATER MONITORING STATION

Consultant

Project title

Contract No. EP/SP/186/21 West New Territories Landfill Extension

Drawing title

SURFACE WATER MONITORING STATION

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Appendix E

Meteorological Data

Date		Weather	Total Rainfall (mm)	Lau Fau Shan Station			
				Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Oct-24	Tue	Fine, very hot during the day	0	29.9	34	66.7	N
2-Oct-24	Wed	Dry with sunny periods.	0	26.7	30	62.5	N
3-Oct-24	Thu	Mainly fine and dry.	0	25.8	22	56.5	N
4-Oct-24	Fri	Dry with sunny periods.	0	26.8	13.7	53	NE
5-Oct-24	Sat	Moderate north to northeasterly winds.	0	28.3	11.5	61	NE
6-Oct-24	Sun	Mainly fine and dry.	0	29.1	8.7	67.5	E/NE
7-Oct-24	Mon	Very hot with sunny periods in the afternoon.	0	29.8	11.2	66.5	E/NE
8-Oct-24	Tue	Mainly fine, dry and hot in the afternoon.	0	29	13.7	59.5	NE
9-Oct-24	Wed	Sunny intervals during the day.	Trace	26.5	15	70.5	E
10-Oct-24	Thu	Dry with sunny periods.	Trace	27.2	11.2	66.0	E/NE
11-Oct-24	Fri	Mainly fine, dry and hot in the afternoon.	8.7	26.9	10.8	64.7	E/NE
12-Oct-24	Sat	Cloudy periods tonight.	0	28.7	12.7	69.1	E
13-Oct-24	Sun	Moderate easterly winds.	0	29.2	14.2	68.5	E
14-Oct-24	Mon	Mainly fine. Moderate easterly winds.	0	24.2	11.2	72	E
15-Oct-24	Tue	Mainly fine in the afternoon.	0	29.3	9.2	73.5	E
16-Oct-24	Wed	Sunny periods in the afternoon.	Trace	29.9	14	70	E
17-Oct-24	Thu	Mainly cloudy tonight.	Trace	28.9	16	71.2	E
18-Oct-24	Fri	Mainly cloudy tonight. Moderate easterly winds.	Trace	28.8	12	78.5	E
19-Oct-24	Sat	Mainly cloudy tonight.	0	29.5	8.7	74.2	W/SW
20-Oct-24	Sun	Sunny periods in the afternoon.	1.9	29.4	21.5	74.5	E
21-Oct-24	Mon	Mainly cloudy. Sunny intervals during the day.	Trace	Maintance	11	Maintance	W/NW
22-Oct-24	Tue	Moderate east to northeasterly winds.	0	Maintance	17	Maintance	N
23-Oct-24	Wed	Sunny periods in the afternoon.	0	25.1	22	64.5	N
24-Oct-24	Thu	Mainly cloudy tonight.	0	24	24	52	N
25-Oct-24	Fri	Mainly cloudy tonight. Moderate easterly winds.	0	25.5	25	50	N
26-Oct-24	Sat	Sunny periods in the afternoon.	0.7	27.3	17.8	67.5	N
27-Oct-24	Sun	Mainly cloudy tonight.	Trace	26.7	11	69.7	NE
28-Oct-24	Mon	Cloudy periods tonight.	Trace	25.7	16.5	69.2	NE
29-Oct-24	Tue	Moderate east to northeasterly winds	Trace	25.5	11.5	74.0	E/NE
30-Oct-24	Wed	Sunny periods.	0	26	11.2	66.5	N/NE
31-Oct-24	Thu	One or two light rain patches at night.	0	26.1	19.5	61.0	N/NW

Date		Weather	Total Rainfall (mm)	Lau Fau Shan Station			
				Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Nov-24	Fri	Moderate east to northeasterly winds	0	27.1	26	54	N
2-Nov-24	Sat	Moderate to fresh east to northeasterly winds	0	24.4	11.2	65.2	N
3-Nov-24	Sun	Mainly cloudy with one or two light rain patches tonight.	0	26	8.7	71.5	E/NE
4-Nov-24	Mon	Sunny periods in the afternoon.	Trace	27.2	9.2	75	E
5-Nov-24	Tue	Moderate east to northeasterly winds	Trace	27.4	12.5	66.5	NE
6-Nov-24	Wed	Fine and dry.	Trace	26.5	29.5	52.5	NE
7-Nov-24	Thu	Moderate north to northeasterly winds.	Trace	24.6	17.5	57	NE
8-Nov-24	Fri	fine. Very dry during the day.	0	23.2	12.5	51.5	NE
9-Nov-24	Sat	Sunny periods in the afternoon.	1.9	26.6	11.7	68.5	E
10-Nov-24	Sun	Sunny periods. One or two isolated showers	6.2	25.3	13.2	76.0	E
11-Nov-24	Mon	Moderate east to northeasterly winds,	0	26.7	10.7	70.0	E/NE
12-Nov-24	Tue	Mainly fine. Moderate northeasterly winds	0	27.2	8.7	71.5	E/NE
13-Nov-24	Wed	Winds will moderate and showers	14.8	24.2	7.5	88	N/NE
14-Nov-24	Thu	Sunny periods. One or two isolated showers	6.3	23.9	18.7	97	E/NE
15-Nov-24	Fri	Cloudy with a few rain patches.	36.6	24.3	10	97.5	E/NE
16-Nov-24	Sat	Moderate to fresh northeasterly winds	33.3	25.6	12.7	95.2	E/NE
17-Nov-24	Sun	Sunny periods.	6.1	24.4	6.2	91.2	E/NE
18-Nov-24	Mon	A few rain patches later.	Trace	24.7	18	78.7	N/NE
19-Nov-24	Tue	Moderate to fresh north to northeasterly winds	7.3	19.3	20.5	88.7	NE
20-Nov-24	Wed	Cloudy to overcast with rain.	73.8	17.3	16.2	98.7	NE
21-Nov-24	Thu	Mainly cloudy.	5.6	19.2	10.7	87.5	NE
22-Nov-24	Fri	Dry and warm	Trace	19.5	16.7	78.2	NE
23-Nov-24	Sat	Light to moderate northeasterly winds	Trace	19.4	12.5	87.2	NE
24-Nov-24	Sun	Dry and warm	1	19.1	10	90	E/NE
25-Nov-24	Mon	Sunny periods.	Trace	20.7	10.7	88	NE
26-Nov-24	Tue	Moderate east to northeasterly winds	1.2	19.6	20	75.5	N/NE
27-Nov-24	Wed	Fine and dry.	0	17.9	13.7	56.5	NE
28-Nov-24	Thu	Moderate east to northeasterly winds,	0	18.4	13.7	42.5	NE
29-Nov-24	Fri	Fine and dry.	0	18.5	19.2	39.0	NE
30-Nov-24	Sat	fine. Very dry during the day.	0	17.7	17.8	37.5	NE

Date		Weather	Total Rainfall (mm)	Lau Fau Shan Station			
				Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Dec-24	Sun	Light to moderate northeasterly winds	0	18.1	8.7	73	E/SE
2-Dec-24	Mon	Dry and warm	0	20.2	10	73.5	E/SE
3-Dec-24	Tue	Mainly cloudy	0	20.9	7	87	E
4-Dec-24	Wed	Mainly fine. Moderate east to northeasterly winds.	0	23.4	11.2	72.5	E
5-Dec-24	Thu	Moderate east to northeasterly winds	0	21	7.5	81.7	E
6-Dec-24	Fri	Mainly fine.	0	20.2	10	71.7	E/NE
7-Dec-24	Sat	Warm with sunny periods during the day.	0	19.7	16.7	72.5	NE
8-Dec-24	Sun	Moderate east to northeasterly winds	0	17.3	14.2	65	NE
9-Dec-24	Mon	Warm with sunny periods during the day.	0	18.4	10.2	68.5	NE
10-Dec-24	Tue	Mainly fine.	0	21.2	9.7	72.0	E
11-Dec-24	Wed	Mainly cloudy and dry	0	21.9	10.5	74.5	N/NW
12-Dec-24	Thu	Sunny intervals during the day	0	18.2	16.7	67	NE
13-Dec-24	Fri	Mainly cloudy and dry	0	16.8	20.2	66.2	NE
14-Dec-24	Sat	Mainly cloudy and dry	0	14.7	17.1	57	NE
15-Dec-24	Sun	Sunny intervals during the day	Trace	13.8	13.7	40	N/NE
16-Dec-24	Mon	Very dry during the day	0	15.7	9.5	40	NE
17-Dec-24	Tue	Very dry during the day	0	16.5	5.5	55	S/SE
18-Dec-24	Wed	Moderate north to northeasterly winds.	0	19.1	11.2	77.5	E/NE
19-Dec-24	Thu	Very dry during the day	0	14.7	13.7	40	N/NE
20-Dec-24	Fri	Fine. Cold in the morning.	0	13.8	11.2	43	NE
21-Dec-24	Sat	Dry with sunny intervals during the day	0	15.3	10.8	41.2	N/NE
22-Dec-24	Sun	Very dry during the day	0	14.9	13.2	45.5	E/NE
23-Dec-24	Mon	Moderate to fresh northeasterly winds	0	16	14.5	52.5	N/NE
24-Dec-24	Tue	Mainly cloudy.	0	17.7	14.2	52.5	NE
25-Dec-24	Wed	Fine and dry.	Trace	16.4	9.2	71.2	N/NE
26-Dec-24	Thu	Moderate to fresh northeasterly winds	0	20	9.2	71.2	N/NE
27-Dec-24	Fri	Mainly cloudy.	0	20.5	9	66.1	N/NE
28-Dec-24	Sat	Very dry during the day	0	16.2	10.2	67	E
29-Dec-24	Sun	Light to moderate east to northeasterly winds.	0	14.8	10	65.0	E
30-Dec-24	Mon	Fine and dry.	0	16.5	8.5	71	E
31-Dec-24	Tue	Very dry during the day	Trace	19.0	12.0	55.0	E

Appendix F

Event and Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET	**IEC**	**SM**	**Contractor**
Action level exceedance for one sample	1. Identify source 2. Inform IEC, SM and Contractor 3. Repeat measurements to confirm findings. 4. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily	1. Check monitoring data and Contractor's working methods	1. Notify Contractor for the identification of cause	1. Rectify any unacceptable practice 2. Amend working methods if appropriate
Action level exceedance for two or more consecutive samples	1. Identify source 2. Notify IEC, SM and Contractor 3. Repeat measurements to confirm findings. 4. Investigate the cause of exceedance and check Contractor's working procedures 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Discuss with IEC and SM on remedial actions required 7. If exceedance continues, arrange meeting with IEC and Contractor 8. If exceedance stops, cease additional monitoring.	1. Review monitoring data submitted by ET 2. Review the investigation finding submitted by ET and check the Contractor's working method 3. Review the proposed remedial measures by Contractor and advise SM accordingly 4. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing 2. Require Contractor to propose remedial measures for the analysed dust problem 3. Ensure remedial measures properly implemented.	1. Rectify any unacceptable practice 2. Amend working methods if appropriate 3. Submit proposals for remedial actions to IEC within 3 working days of notification 4. Implement the agreed proposals 5. Amend proposal if appropriate.
Limit level exceedance for one sample	1. Identify source 2. Inform IEC, SM and Contractor 3. Repeat measurements to confirm findings. 4. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SM informed of the results	1. Review monitoring data submitted by ET 2. Discuss amongst SM, ET Leader and Contractor on the potential remedial actions. 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of exceedance in writing 2. Require Contractor to propose remedial measures for the analysed dust problem 3. Ensure remedial measures properly implemented	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. Amend proposal if appropriate
Limit level exceedance for two or more consecutive samples	1. Identify source 2. Repeat measurements to confirm findings 3. Inform IEC, SM, Contractor and EPD 4. Investigate the cause of exceedance and carry out	1. Review monitoring data submitted by ET 2. Discuss amongst SM, ET Leader and	1. Confirm receipt of notification of exceedance in writing 2. Require Contractor to propose	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC

Event	Action			
	ET	**IEC**	**SM**	**Contractor**
	analysis of Contractor's working procedures to determine possible mitigation to be implemented 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SM informed of the results 7. If exceedance continues, arrange meeting with IEC and Contractor 8. If exceedance stops, cease additional monitoring.	Contractor on the potential remedial actions. 3. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise SM accordingly 4. Supervise the implementation of remedial measures.	remedial measures for the analysed dust problem 3. Ensure remedial measures properly implemented; 4. If exceedance continues, consider what activity of the work is responsible and instruct Contractor to stop that activity of work until the exceedance is abated	within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SM until the exceedance is abated.

Notes:
ET – Environmental Team
IEC – Independent Environmental Checker
SM – Service Manager

Event / Action Plan for Construction Noise

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

Notes:
ET – Environmental Team
IEC – Independent Environmental Checker
SM – Service Manager

Event / Action Plan for Water Quality

Event	ET	IEC	SM	Contractor
Action level being exceeded by one sampling day	• Identify source(s) of impact; • Inform IEC, Contractor; Check monitoring data, all plant, equipment and Contractor's working methods.	• Check monitoring data and Contractor's working methods.	• Confirm receipt of notification of non-compliance in writing; and • Notify Contractor.	• Rectify unacceptable practice; and • Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	• Identify source(s) of impact; • Inform IEC, Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; Ensure mitigation measures are implemented; • If the exceedance is confirmed to be Project related after investigation, increase the monitoring frequency to daily until no exceedance of Action level	• Check monitoring data and Contractor's working method; • Discuss with ET and Contractor on possible remedial actions; • Review the proposed mitigation measures; and • Supervise the implementation of mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Ensure mitigation measures are properly implemented; and • Assess the effectiveness of the implemented mitigation measures	• Rectify unacceptable practice; • Check all plant and equipment and consider changes of working methods; • Submit proposal of additional mitigation measures to IEC within 3 working days of notification; and • Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	• Identify source(s) of impact; • Inform IEC, SM and Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, SM and Contractor; Ensure mitigation measures are implemented; and • If the exceedance is confirmed to be Project related after investigation, repeat measurement on next day of exceedance.	• Check monitoring data submitted by ET and Contractor's working method; • Discuss with ET and Contractor on possible remedial actions; • Review the proposed mitigation measures submitted by Contractor and advise the SM accordingly.	• Confirm receipt of notification of failure in writing; • Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to review the working methods.	• Take immediate corrective actions to avoid further exceedance; • Submit proposal of mitigation measures to IEC within 3 working days; • Implement the agreed mitigation measures; • Submit further mitigation measures if problem still not under control;

Event	ET	IEC	SM	Contractor
Limit level being exceeded by two or more consecutive sampling days	• Identify source(s) of impact; • Inform IEC, SM, EPD • Check monitoring data, all plant, equipment and • Contractor's working methods; Discuss mitigation measures with IEC, SM and Contractor; • Ensure mitigation measures are implemented; • If the exceedance is confirmed to be Project related after investigation, increase the monitoring frequency to daily until no exceedance of Limit level	• Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; • Review the • Contractor's mitigation measures • whenever • necessary to assure their effectiveness; • Supervise the implementation of mitigation measures.	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; • Make agreement on the mitigation measures and ensure mitigation measures are properly implemented; • Consider and instruct, if necessary, to slow down or stop that activity of work until exceedance is abated.	• Take immediate corrective actions to avoid further exceedance; • Submit proposal of mitigation measures to IEC within 3 working days; • Implement the agreed mitigation measures; Resubmit proposals if problem still not under control; • Slow down or to stop relevant activity until exceedance is abated.

Notes:
ET – Environmental Team
IEC – Independent Environmental Checker
SM – Service Manager

Event and action plan for landscape and visual monitoring during Construction

	ET	IEC	SM	Contractor
Design checking	Check final design conforms to the requirements of EP and prepare report	Check report. Recommend remedial design if necessary	Undertake remedial design if necessary	Ensure compliance with EP requirements
Exceedance on one occasion	Identify source of impact Inform IEC and SM Discuss remedial actions with IEC, SM and Contractor Monitor remedial actions until rectification has been completed	• Check monitoring report • Check Contractor's working method • Discuss with ET and Contractor on possible remedial measures • Advise SM on effectiveness of proposed remedial measures • Check implementation of remedial measures	• Notify Contractor • Ensure remedial measures are properly implemented	• Amend working methods • Rectify damage and undertake any necessary replacement
Repeated Exceedance(s)	• Identify source of impact • Inform IEC and SM • Increase monitoring frequency • Discuss remedial actions with IEC, SM and Contractor • Monitor remedial actions until rectification has been completed • If exceedance stops, cease additional monitoring	• Check monitoring report • Check Contractor's working method • Discuss with ET and Contractor on possible remedial measures • Advise SM on effectiveness of proposed remedial measures • Supervise implementation of remedial measures	• Notify Contractor • Ensure remedial measures are properly implemented	• Amend working methods • Rectify damage and undertake any necessary replacement

Notes:
ET – Environmental Team
IEC – Independent Environmental Checker
SM – Service Manager

Appendix G

Monitoring Schedule

Impact Monitoring Schedule (October 2024)

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

Impact Monitoring Schedule (November 2024)

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

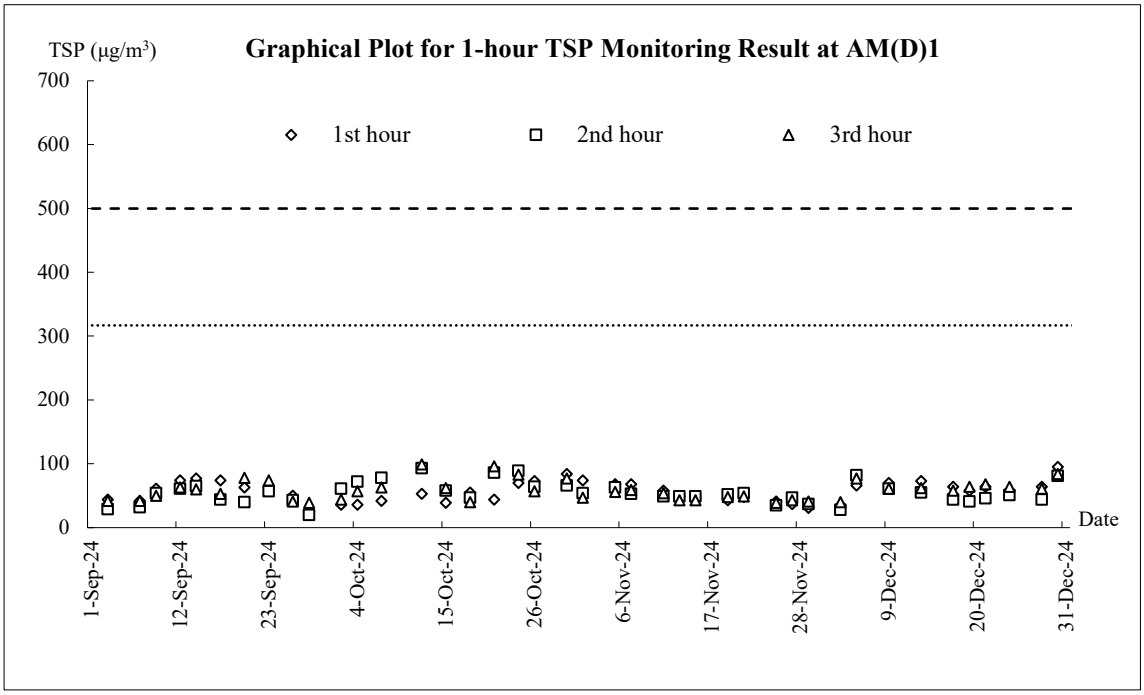
Impact Monitoring Schedule (December 2024)

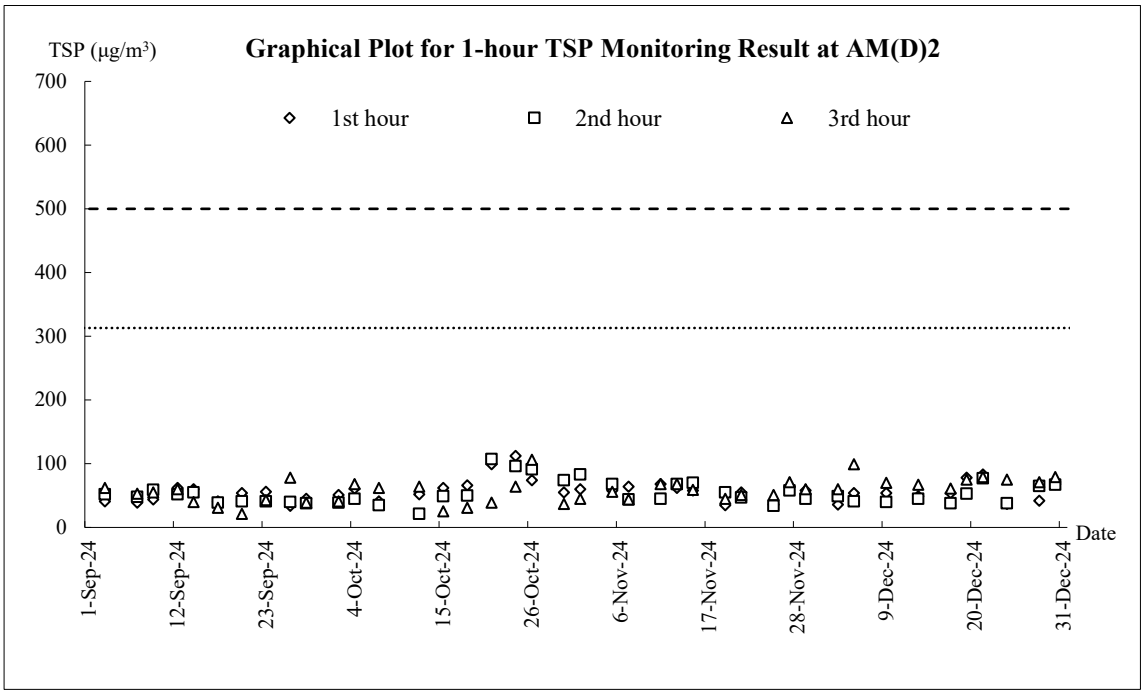
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 1-Hr TSP X3 24-Hr TSP Noise	4	5 1-Hr TSP X3 24-Hr TSP Surface Water	6	7
8	9 1-Hr TSP X3 24-Hr TSP Noise	10	11	12	13 1-Hr TSP X3 24-Hr TSP	14
15	16	17 1-Hr TSP X3 24-Hr TSP Noise	18	19 1-Hr TSP X3 24-Hr TSP	20	21 1-Hr TSP X3 24-Hr TSP
22	23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

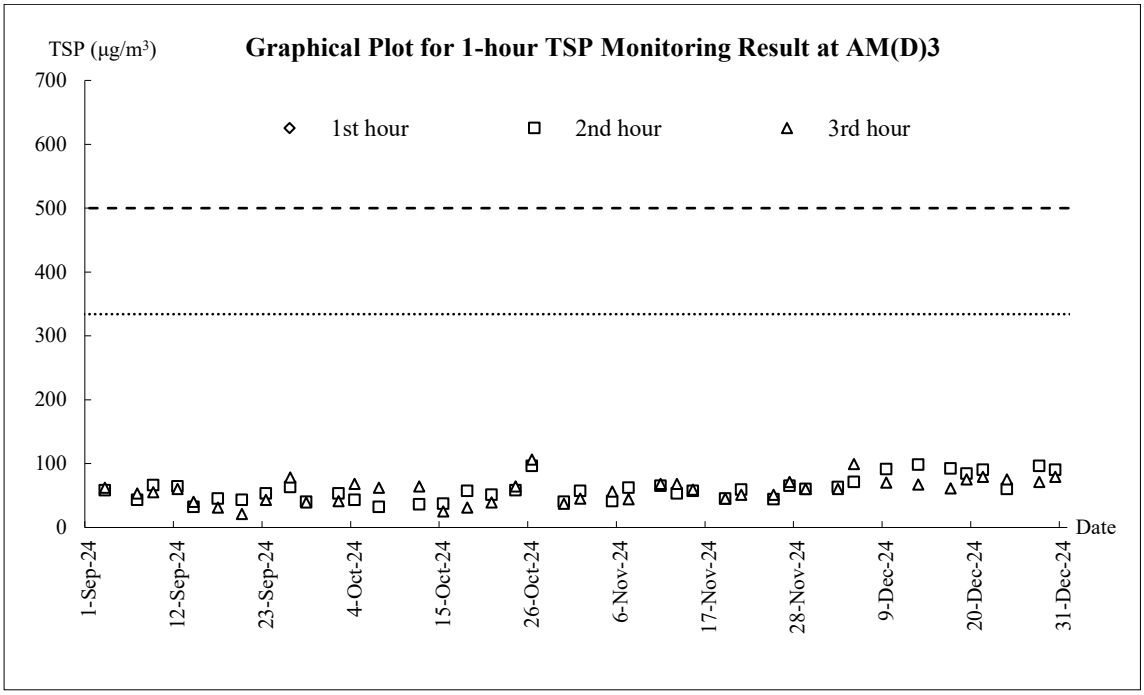
Appendix H

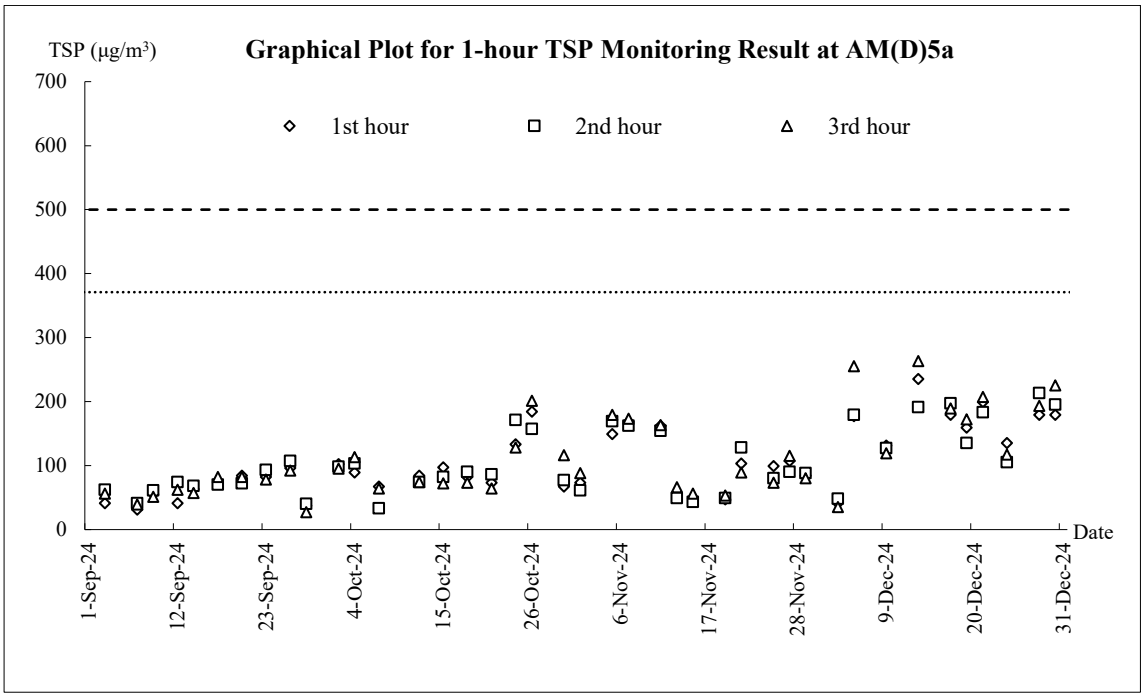
Graphical Plots for Monitoring Result

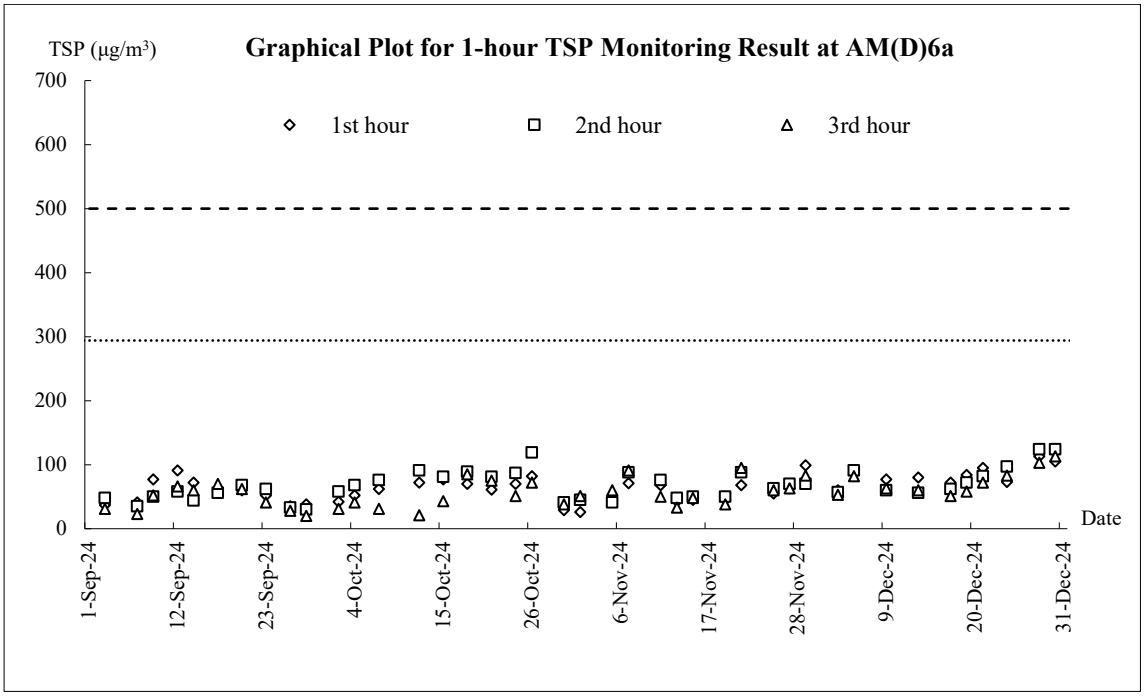
Air Quality – 1-hour TSP

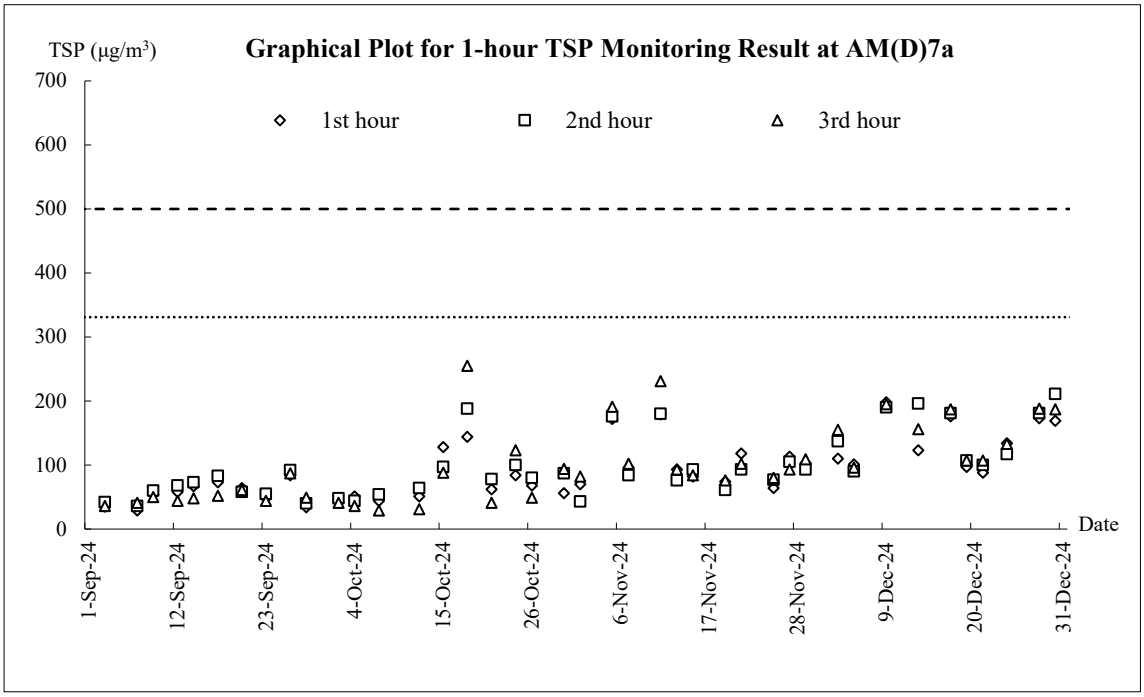




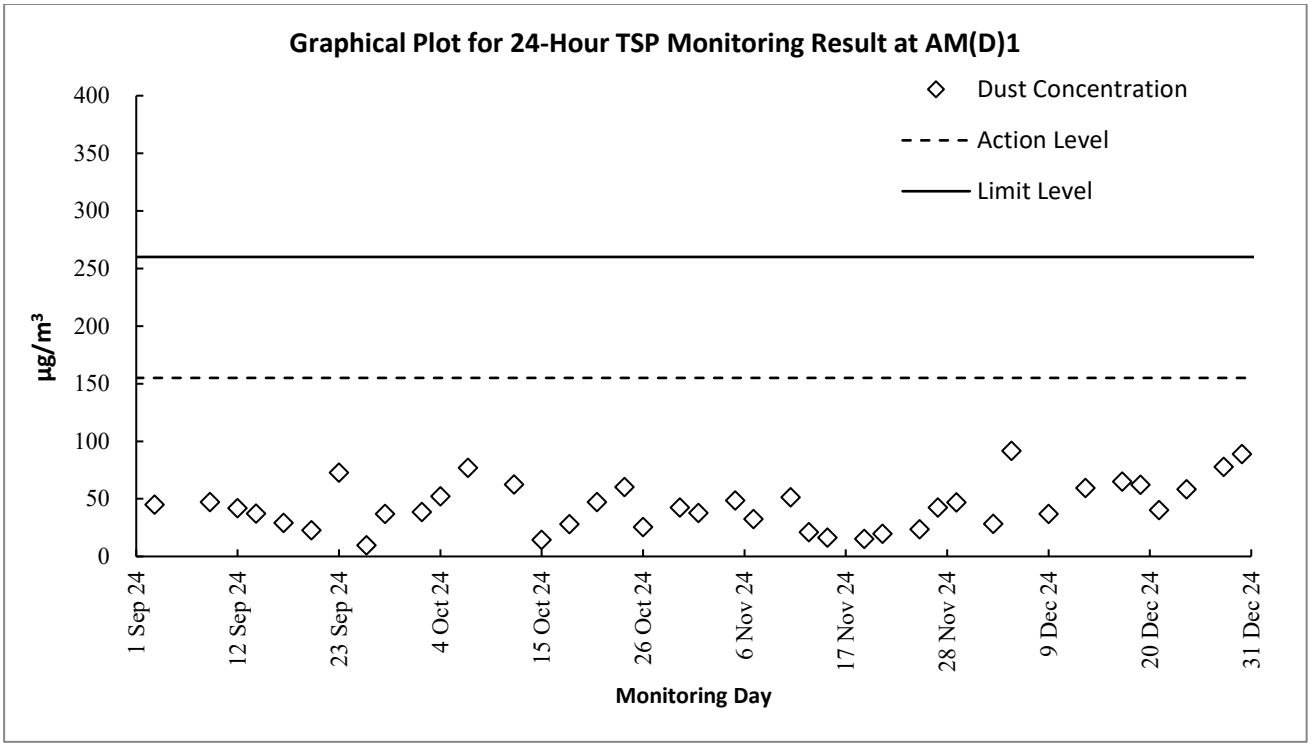

Graphical Plot for 1-hour TSP Monitoring Result at AM(D)3
TSP (μg/m³)
700
600
500
400
300
200
100
0
1st hour
2nd hour
3rd hour
Date
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24

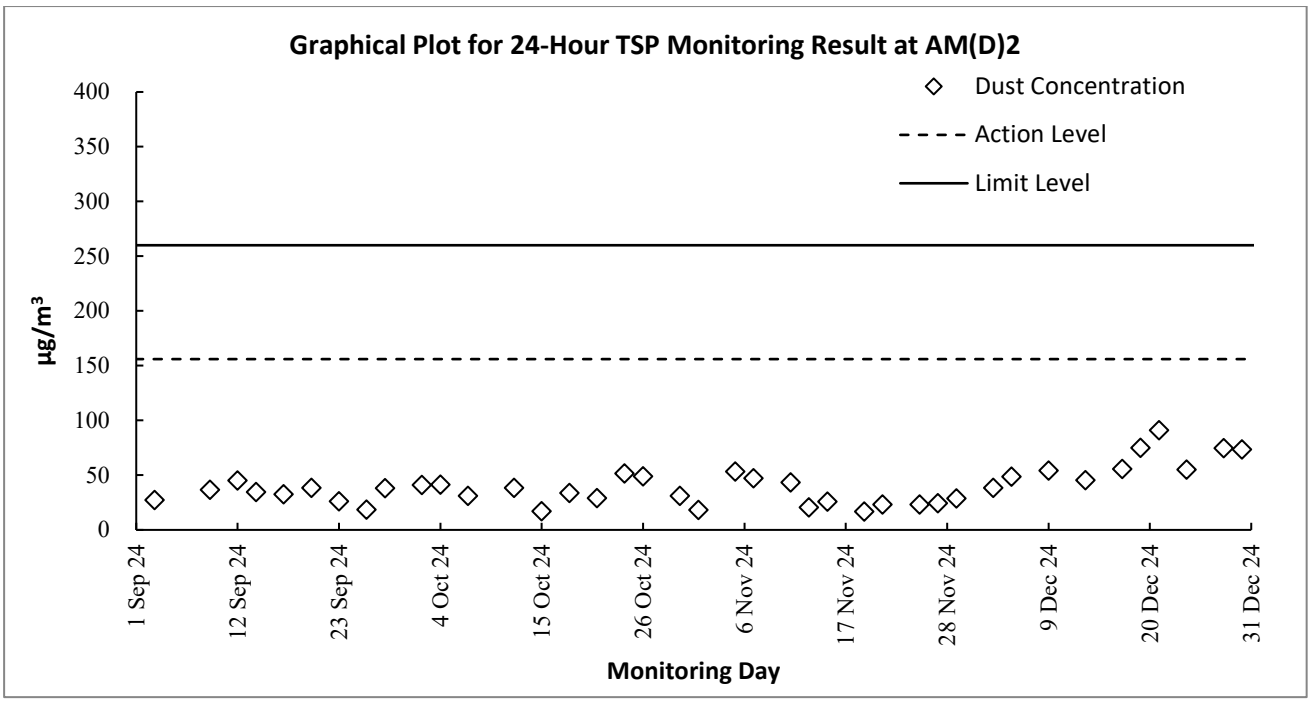

Graphical Plot for 1-hour TSP Monitoring Result at AM(D)5a
TSP (μg/m³)
700
600
500
400
300
200
100
0
1st hour
2nd hour
3rd hour
Date
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24

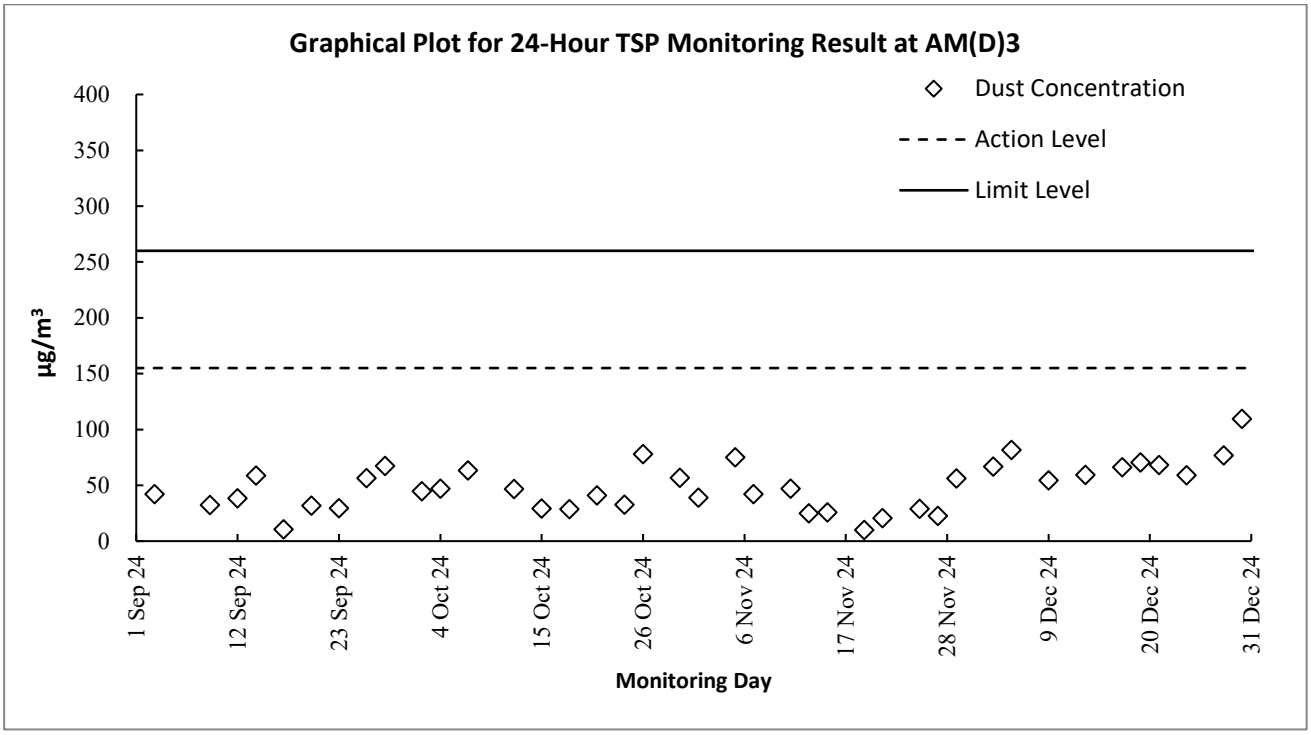

Graphical Plot for 1-hour TSP Monitoring Result at AM(D)6a
TSP (μg/m³)
700
600
500
400
300
200
100
0
1st hour
2nd hour
3rd hour
Date
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24

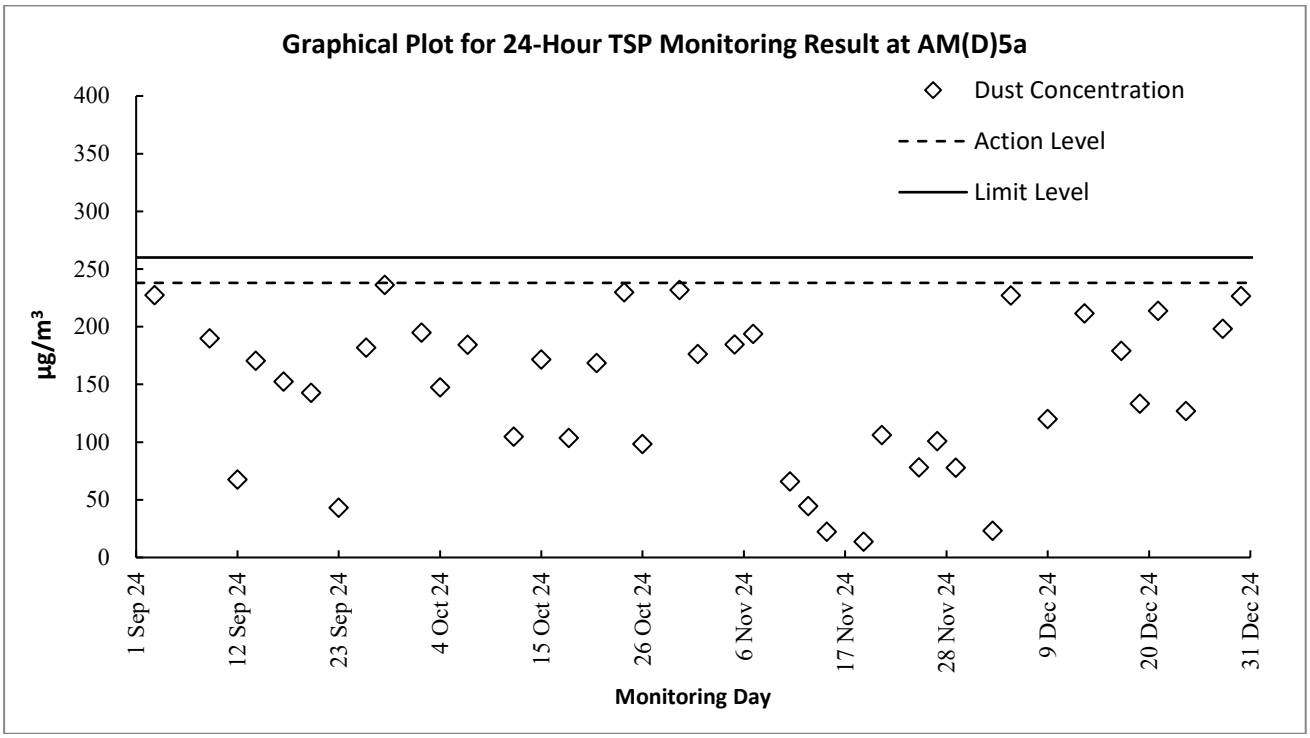

Graphical Plot for 1-hour TSP Monitoring Result at AM(D)7a
TSP (μg/m³)
700
600
500
400
300
200
100
0
1st hour
2nd hour
3rd hour
Date
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24

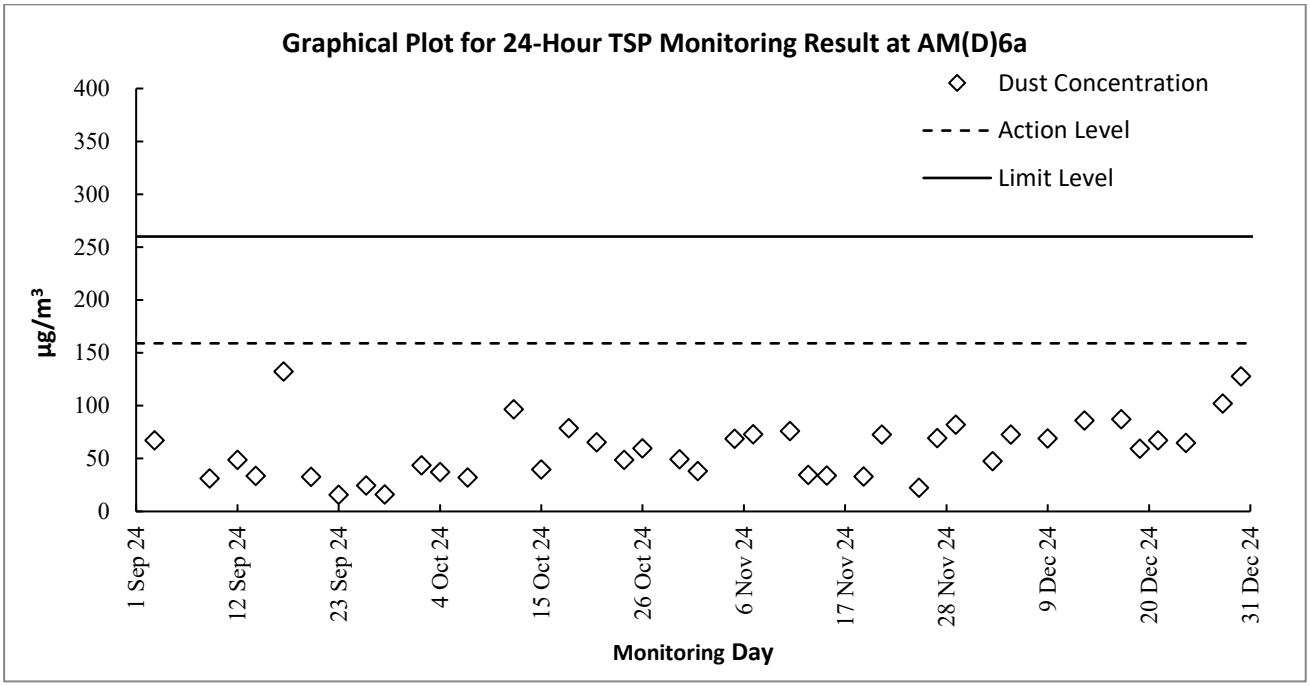
Air Quality – 24-hour TSP

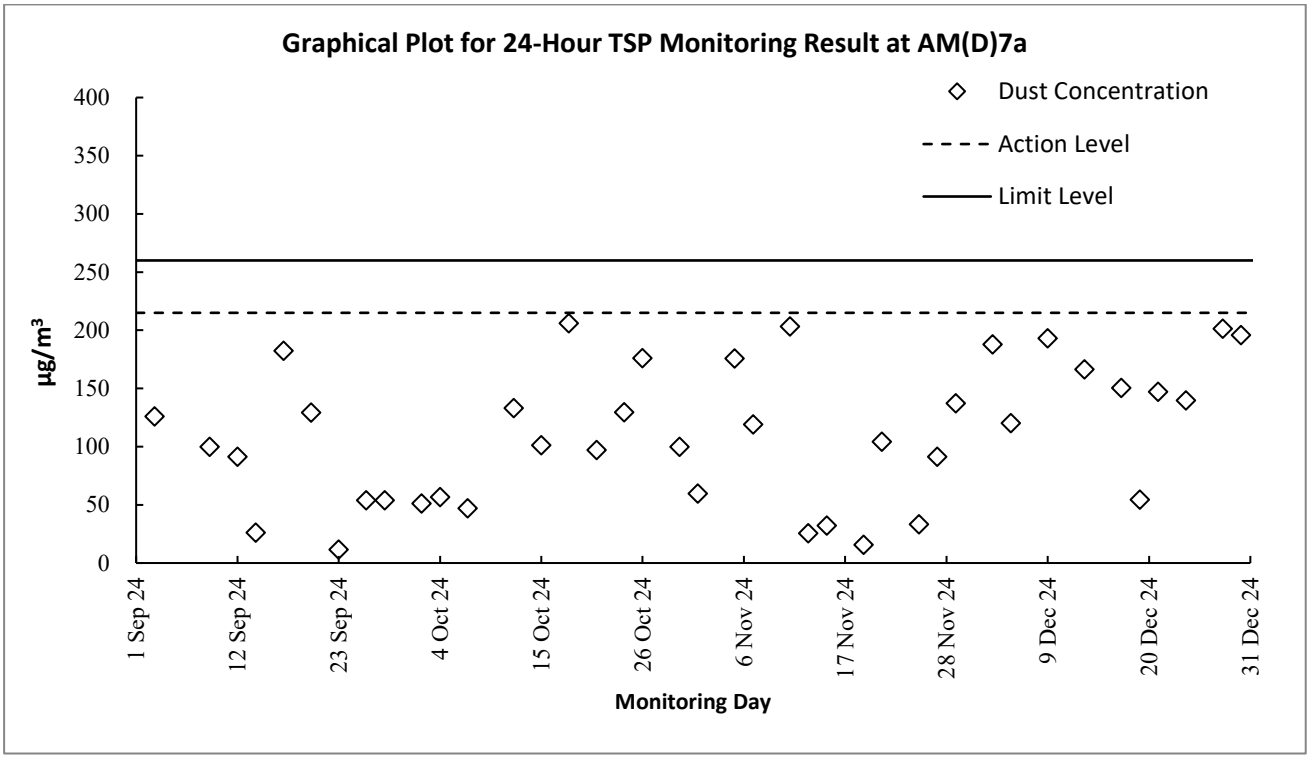




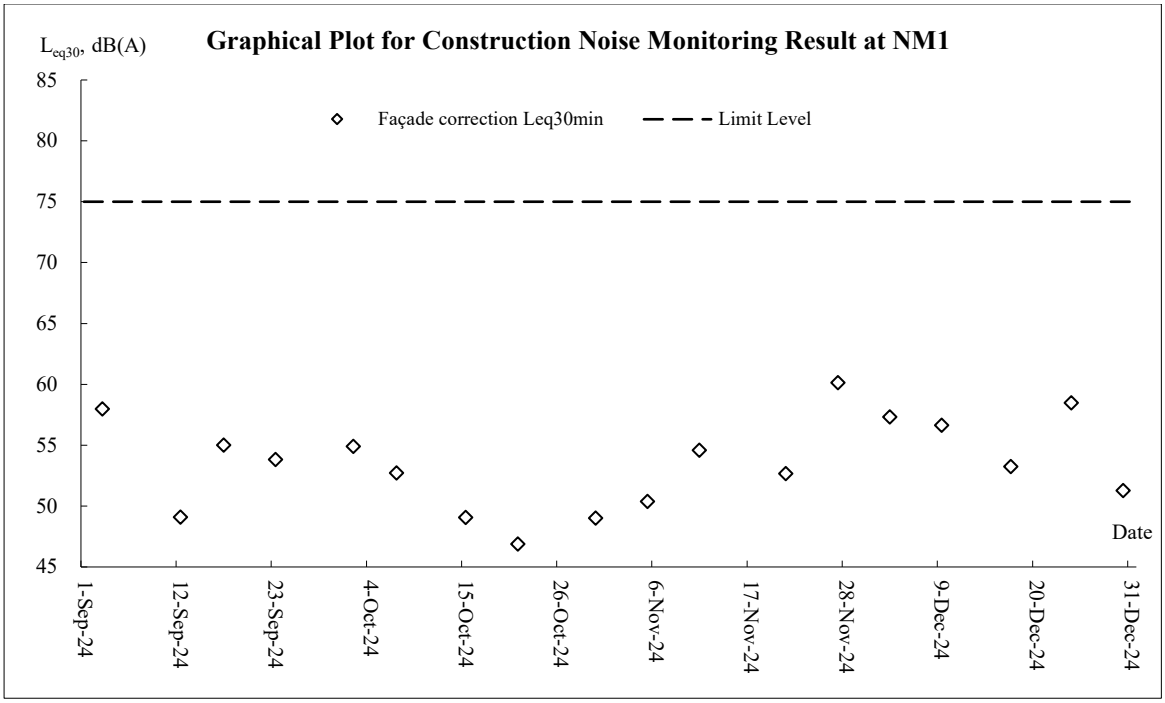

Graphical Plot for 24-Hour TSP Monitoring Result at AM(D)3
Dust Concentration
Action Level
Limit Level
µg/m³
400
350
300
250
200
150
100
50
0
1 Sep 24
12 Sep 24
23 Sep 24
4 Oct 24
15 Oct 24
26 Oct 24
6 Nov 24
17 Nov 24
28 Nov 24
9 Dec 24
20 Dec 24
31 Dec 24
Monitoring Day


Graphical Plot for 24-Hour TSP Monitoring Result at AM(D)5a
Dust Concentration
Action Level
Limit Level
µg/m³
400
350
300
250
200
150
100
50
0
1 Sep 24
12 Sep 24
23 Sep 24
4 Oct 24
15 Oct 24
26 Oct 24
6 Nov 24
17 Nov 24
28 Nov 24
9 Dec 24
20 Dec 24
31 Dec 24
Monitoring Day

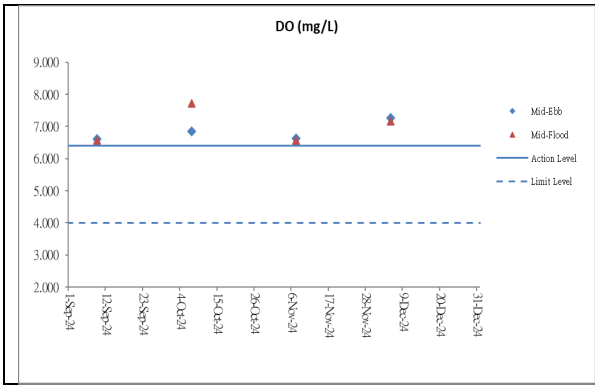

Graphical Plot for 24-Hour TSP Monitoring Result at AM(D)6a
Dust Concentration
Action Level
Limit Level
µg/m³
400
350
300
250
200
150
100
50
0
1 Sep 24
12 Sep 24
23 Sep 24
4 Oct 24
15 Oct 24
26 Oct 24
6 Nov 24
17 Nov 24
28 Nov 24
9 Dec 24
20 Dec 24
31 Dec 24
Monitoring Day

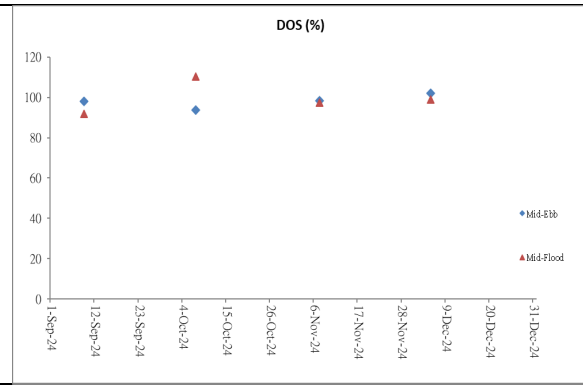

Graphical Plot for 24-Hour TSP Monitoring Result at AM(D)7a
Dust Concentration
Action Level
Limit Level
µg/m³
400
350
300
250
200
150
100
50
0
1 Sep 24
12 Sep 24
23 Sep 24
4 Oct 24
15 Oct 24
26 Oct 24
6 Nov 24
17 Nov 24
28 Nov 24
9 Dec 24
20 Dec 24
31 Dec 24
Monitoring Day

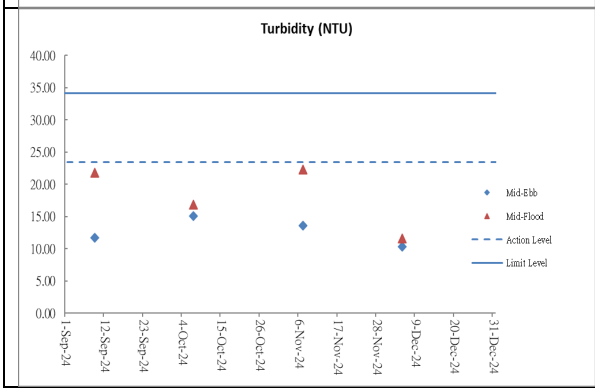
Construction Noise

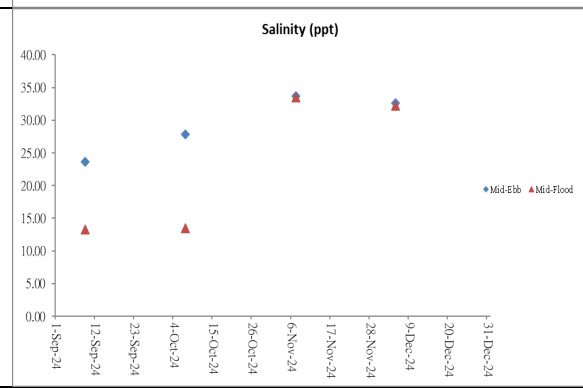


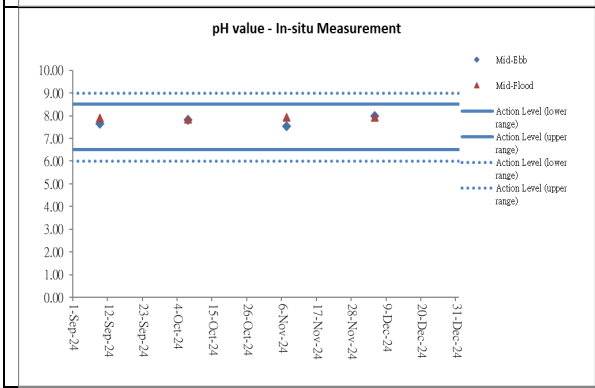
Surface Water

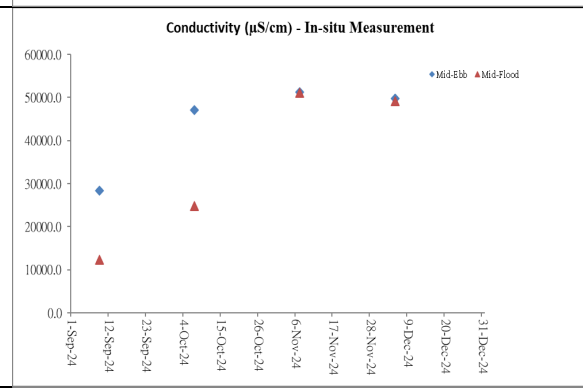


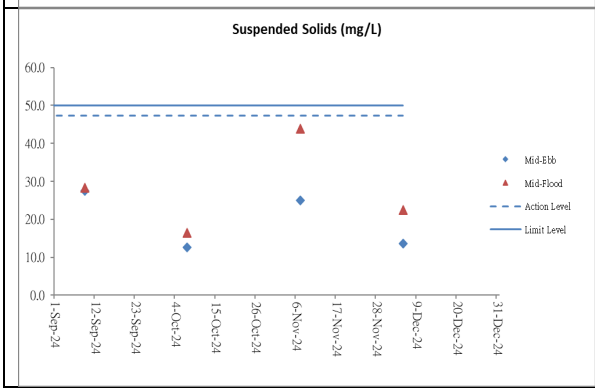


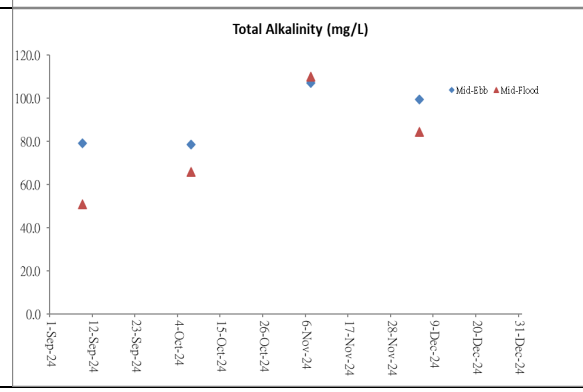


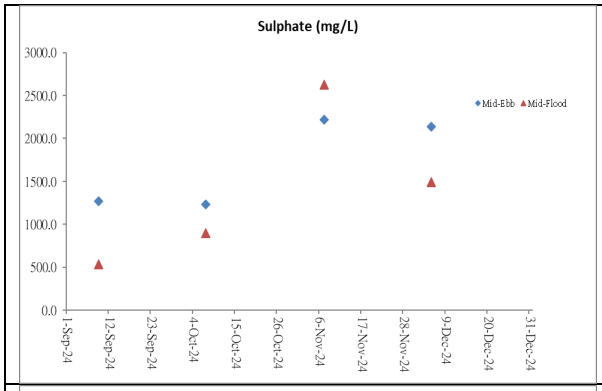


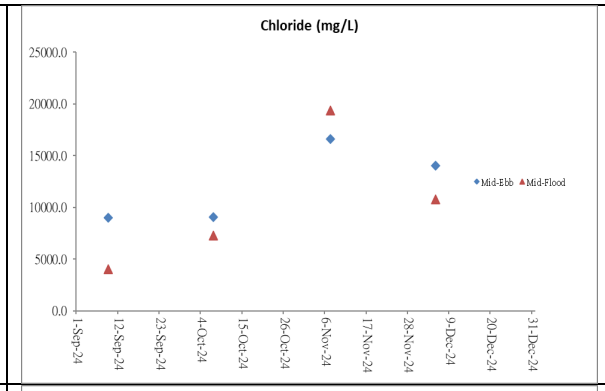


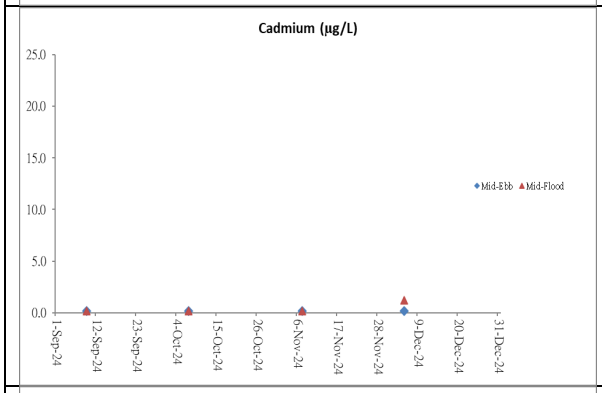


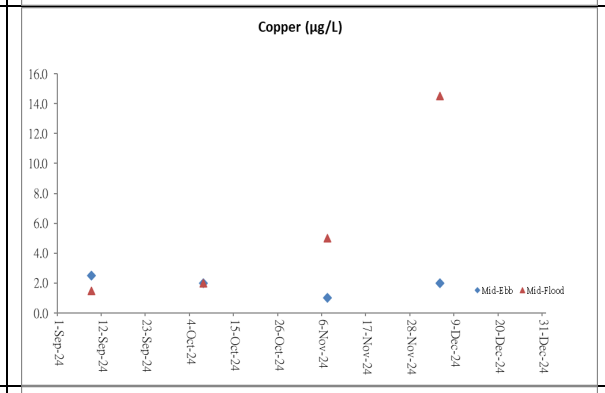


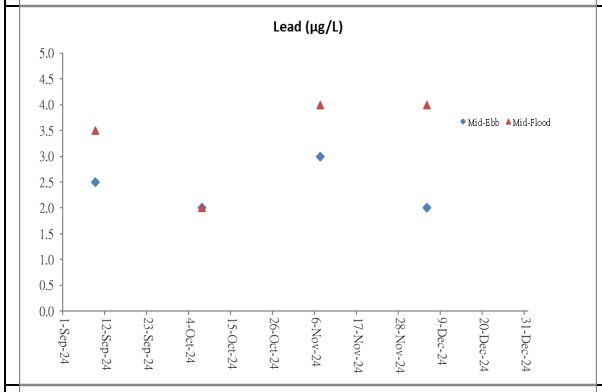


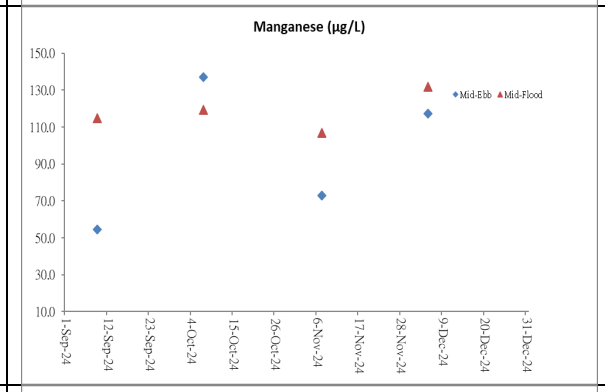

Sulphate (mg/L)
Mid-Ebb
Mid-Flood

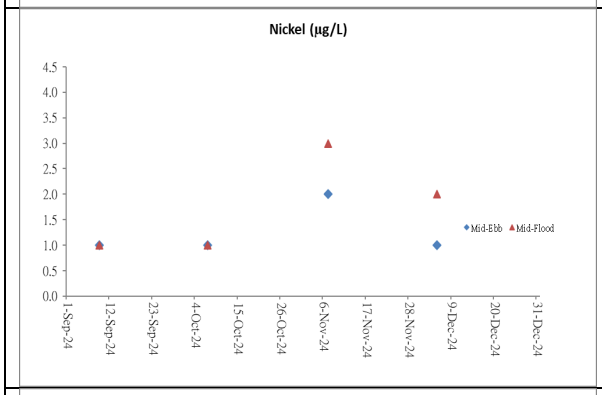

Chloride (mg/L)
Mid-Ebb
Mid-Flood

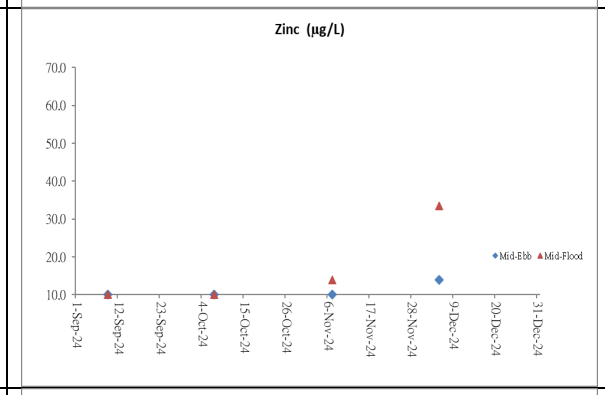

Cadmium (µg/L)
Mid-Ebb
Mid-Flood

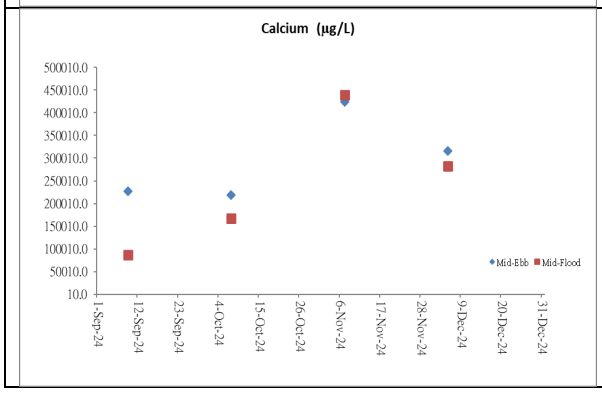

Copper (µg/L)
Mid-Ebb
Mid-Flood

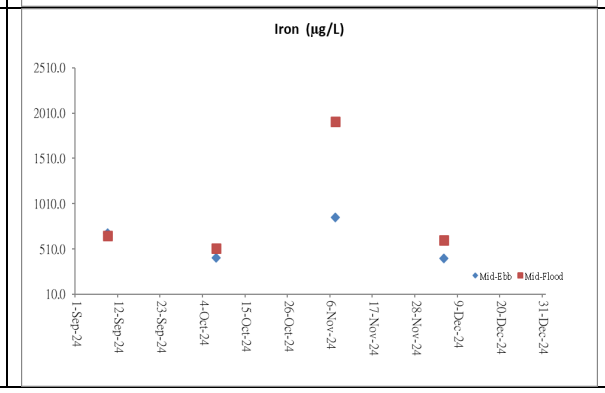

Lead (µg/L)
Mid-Ebb
Mid-Flood

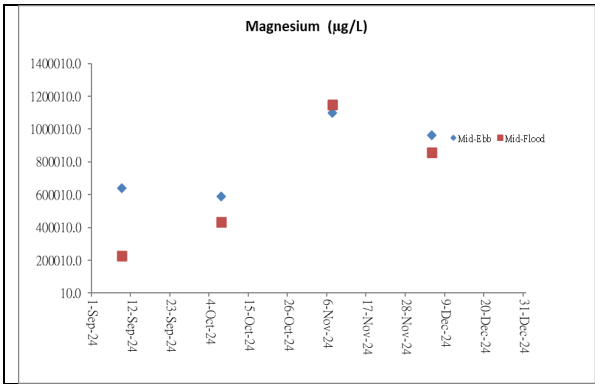

Manganese (µg/L)
Mid-Ebb
Mid-Flood

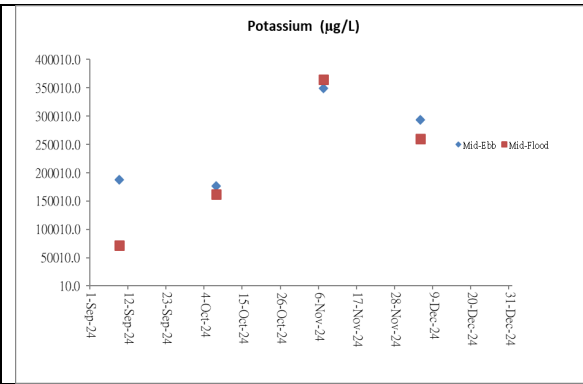

Nickel (µg/L)
Mid-Ebb
Mid-Flood

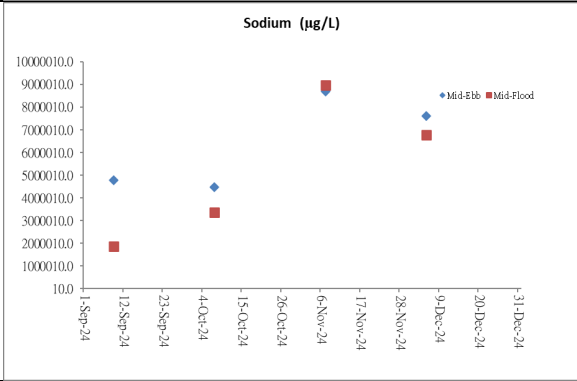

Zinc (µg/L)
Mid-Ebb
Mid-Flood

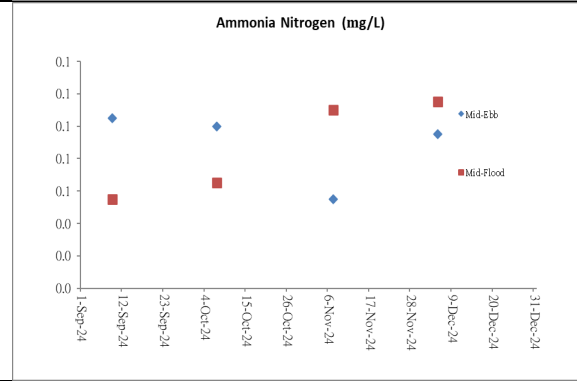

Calcium (µg/L)
Mid-Ebb
Mid-Flood

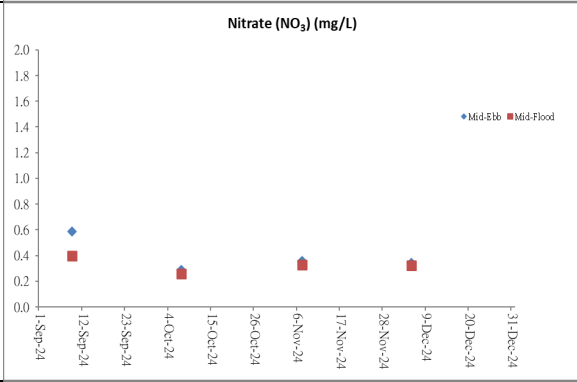

Iron (µg/L)
Mid-Ebb
Mid-Flood

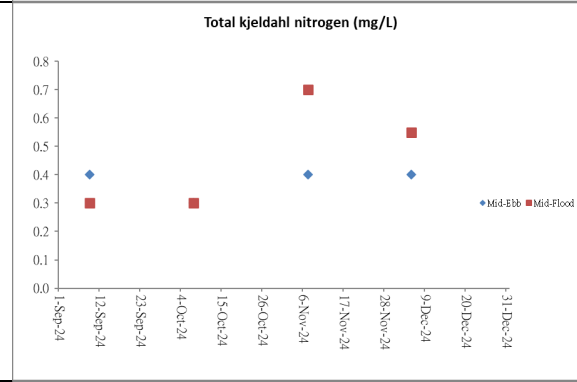

Magnesium (µg/L)
Mid-Ebb
Mid-Flood

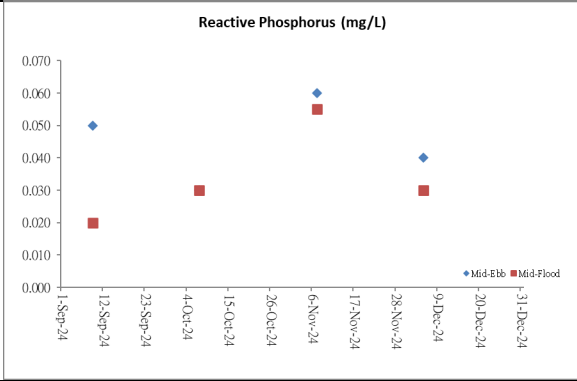

Potassium (µg/L)
Mid-Ebb
Mid-Flood

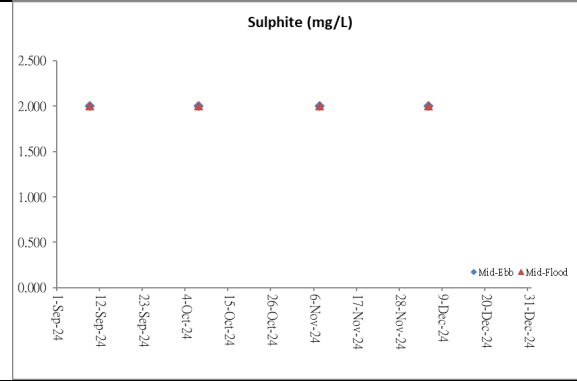

Sodium (µg/L)
Mid-Ebb
Mid-Flood

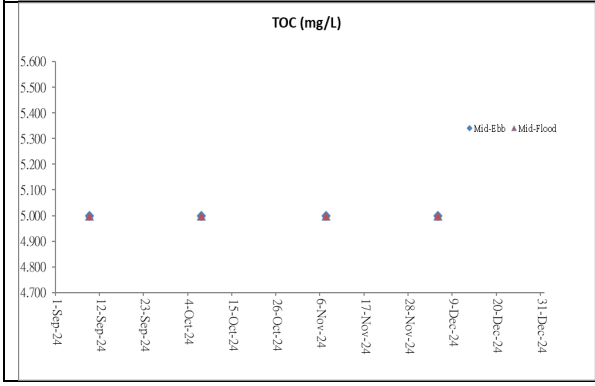

Ammonia Nitrogen (mg/L)
Mid-Ebb
Mid-Flood

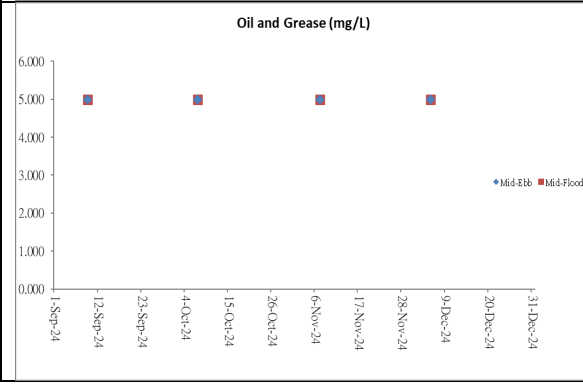

Nitrate (NO_3) (mg/L)
Mid-Ebb
Mid-Flood

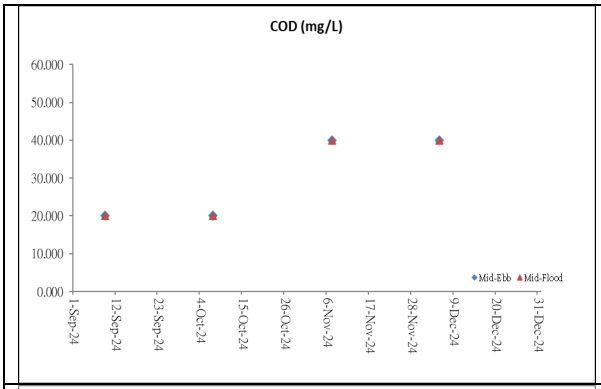

Total kjeldahl nitrogen (mg/L)
Mid-Ebb
Mid-Flood

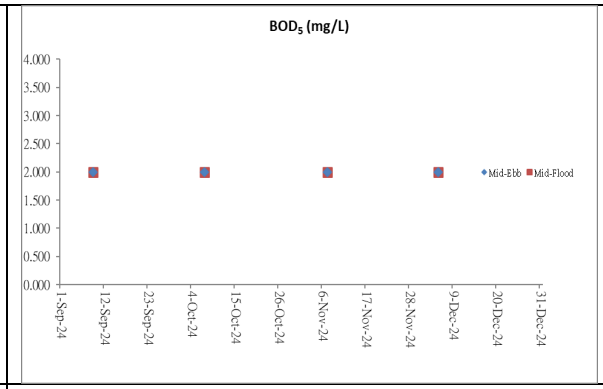

Reactive Phosphorus (mg/L)
Mid-Ebb
Mid-Flood

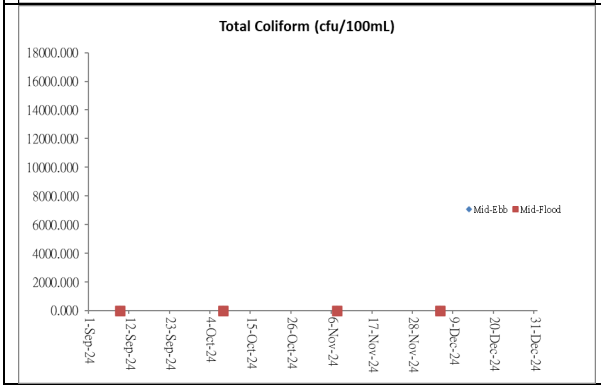

Sulphite (mg/L)
Mid-Ebb
Mid-Flood


TOC (mg/L)
Mid-Ebb
Mid-Flood


Oil and Grease (mg/L)
Mid-Ebb
Mid-Flood


COD (mg/L)
60.000
50.000
40.000
30.000
20.000
10.000
0.000
Mid-Ebb
Mid-Flood
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24


BOD5 (mg/L)
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
Mid-Ebb
Mid-Flood
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24


Total Coliform (cfu/100mL)
18000.000
16000.000
14000.000
12000.000
10000.000
8000.000
6000.000
4000.000
2000.000
0.000
Mid-Ebb
Mid-Flood
1-Sep-24
12-Sep-24
23-Sep-24
4-Oct-24
15-Oct-24
26-Oct-24
6-Nov-24
17-Nov-24
28-Nov-24
9-Dec-24
20-Dec-24
31-Dec-24

Appendix I

Waste Flow Table

Monthly Summary Waste Flow Table

(Specification Part A Clause 1.16.5.4 refers)

Name of Department: EPD

Contract No.: EP/SP/186/21 West New Terriories Landfill Extension

Monthly Summary Waste Flow Table for 2024 (year)

Month	Actual Quantites of Inert C&D Materials Generated Monthly						Actual Quantites of C&D Waste Generated Monthly					
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Yard Waste	Others, e.g. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in kg)	(in kg)	(in kg)	(in '000kg)	(in tonne)	(in '000m3)
Since 2023	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**1118.650**	**0.042**
Jan	0.000	0.000	0.000	0.000	0.000	11.921	0.000	0.000	0.000	0.000	106.800	0.005
Feb	0.000	0.000	0.000	0.000	0.000	21.832	4.000	19.000	0.000	0.000	0.000	0.017
Mar	1.130	0.000	1.130	0.000	0.000	22.943	0.000	0.000	0.000	0.000	477.140	0.006
Apr	5.986	0.000	5.986	0.000	0.000	37.411	0.000	0.000	0.000	0.000	328.910	0.012
May	4.842	0.000	4.842	0.000	0.000	48.736	3.000	16.000	3.000	0.000	172.390	0.019
Jun	18.896	0.000	18.896	0.000	0.000	7.022	0.000	6.000	0.000	0.000	11.120	0.028
Sub-Total	30.854	0.000	30.854	0.000	0.000	149.865	7.000	41.000	3.000	0.000	2215.010	0.129
Jul	11.883	0.000	11.883	0.000	0.000	0.304	0.000	15.000	3.000	0.000	510.840	0.551
Aug	36.426	0.000	36.426	0.000	0.000	5.923	0.600	20.500	6.200	0.000	145.530	6.049
Sep	49.812	0.000	46.992	2.820	0.000	7.864	0.300	11.600	1.600	0.000	916.640	3.759
Oct	117.878	0.000	86.728	31.150	0.000	4.955	23140.000	0.000	0.600	0.000	2678.700	0.115
Nov	64.119	0.000	55.299	8.820	0.000	13.258	80660.000	4.000	2.300	1.200	196.550	0.179
Dec	120.593	0.000	84.717	34.967	0.909	13.232	0.300	1.700	1.600	0.000	324.590	0.174
Total	**431.565**	**0.000**	**352.899**	**77.757**	**0.909**	**195.401**	**103808.200**	**93.800**	**18.300**	**1.200**	**6987.860**	**10.954**

Note:

(1) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials

(2) Project Commenced in Sep 2023.

(3) The waste flow table shall also include C&D materails that are specified in the Contract to be imported for use at the Site.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m3.

(5) Density values and Bulk Factors adopted:

Hard Rock and Large Broken Concrete:	2.5 T/m^3(in-situ)	Imported Rock	2.0 T/m^3
Soil/Fill:	2.0 T/m^3(in-situ)	Imported Soil	1.8 T/m^3
General Refuse:	900 Kg/m^3	Imported Sand	1.6 T/m^3

(6) Actual quantity of Yard Waste includes those were disposed in landfill and sent to Y Park as recyclable.

Appendix J

Environmental Complaints Log

Environmental Complaint Log

Log ref.	Date of Complaint	Complaint Route	Complaint Nature	Investigation fining	Status

Appendix K

Environmental Mitigation Implementation Schedule

Appendix B1 – Air Quality

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Air Quality							
S3.8.1	A1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation. • Dust emission from construction vehicle movement is confined within the worksites area. • Watering facilities will be provided at every designated vehicular exit point. • Watering will be carried out 8 times per day during construction phase.	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	Entire WENT Landfill Extension site	Construction and Restoration phases	• To control the dust impact to within the EM&A criteria (Ref. 1-hr and 24-hr TSP levels are 500μgm^{-3} and 260μgm^{-3}, respectively)
S3.8.2	A2	The following measures shall be exercised for stack discharge from Ammonia Stripping Plant (ASP), Flare and LFG Power Generator: • The maximum allowable discharge limit and pollutant removal efficiency for ASP, flare and LFG power generator should be specified in the design specification. • Owing to the requirement for the installation of stack, the design requirement shall be submitted to IEC and SM for vetting by the Contractor. • Subject to the subsequent EPD's requirement on chimney installation, regular stack monitoring of air pollutants, including NOx, SO2, RSP, NMOCs, vinyl chloride, and benzene shall be carried out at a quarterly interval (i.e. once every 3 months), and the operating conditions, including exhaust gas temperature and velocity shall be monitored continuously in order to demonstrate compliance during the operations. • A monthly monitoring report should be prepared by ET and submitted to IEC and SM for approval.	Minimize the release of harmful air pollutant to the atmosphere	Contractor	Flare, ASP and LFG Power Generator of WENT Landfill Extension	Design, Operation and Restoration phases	• TM-EIA, Annex 4

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S3.8.2	A3	The following measures shall be exercised for the VOC surface emission: • The arrangement of the landfill gas collection system and surface covering material for inactive tipping area shall be reviewed by Contractor every 5 years to identify any modern technology/arrangement (covering material, LFG well spacing and locations). A working team shall be formulated to review all processes, control practice and extraction system in order to maximize the efficiency of the system. A review report should be prepared by the Contractor for the submission to SM and IEC on the implementation/arrangement of LFG extraction system. The first review report should be submitted to SM and IEC for agreement before commencement. With a good system to collect LFG (high extraction efficiency), surface release of VOC to the nearby environment can be much reduced or utilised. • Maintain a slightly negative pressure within the entire tipping area (by suction). Minimise any potential leakage of LFG to the surrounding by increase the number of gas-extraction wells. Improve the extraction efficiency by checking/reinstate gas wells with abnormally low extraction rate due to blockage/soil movement or sedimentation. • Increase the coverage of inactive tipping phases with HDPE/plastic sheet which can enhance the anaerobic decomposition (reduce air getting in and VOC leaking out). • EM&A will be conducted at ASR to establish the future VOC ambient level. This monitoring work should be carried out in a frequency once every 3 months. By comparing the monitoring data at the boundary and at ASR, the cause of VOC and the general downwind dispersion effect (dilution effect) from the boundary to the ASR can be identified. The findings of the monitoring should be incorporated into the landfill gas collection system review report as mentioned above.	Minimize the release of harmful VOC to the environment	Contractor	Active, Inactive and Restored Tipping areas	Design, Before commencement of Operation, Operation and Restoration phases	• TM-EIA, Annex 4

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S3.8.2	A4	The following design options shall be considered in the future leachate treatment plants: • Adopted updated treatment method such as Sequencing Batch Reactor for future leachate treatment. Provision of ventilated cover for the leachate storage lagoons / tanks and emissions extracted to suitable odour removal filters with odour removal efficiency of 99%. • Ferric nitrate or sodium hypochlorite can be added to oxidise the odourous chemical in the leachate. The pH value of leachate can be controlled to a suitable value from future onsite experiment such that the generation of any odourous H_2S and ammonia can be optimised. • The locations of discharge points and discharge heights should be in accordance with the assumptions adopted in the EIA Report and VEP supporting document. If the future locations / heights of the stacks deviate from the assumptions adopted in the EIA Study VEP supporting document, reassessment of the air quality impact should be conducted. • The overall arrangement should be investigated in details by the Contractor and agreed with IEC and EPD.	Environmental Enhancement to improve the air quality and visual impact to nearby sensitive receivers	Contractor	Leachate treatment plants	Design, Operation and Restoration phases	• Environmental Enhancement
S3.8.2	A5	The following are some odour precautionary measures that shall be considered by EPD and FEHD: • As an improvement measure to enhance to environmental standard for waste transfer, EPD could take the initiative to recommend others to use enclosed type RCV in the long run (dominantly government and sludge types). • Clearing / watering of the surface and clearing of the waste water receptor of government RCV is recommended before leaving refuse transfer station or government Refuse Collection Point (FEHD).	Environmental Enhancement to improve the odour impact during the transit of waste	EPD, FEHD	Government RC from RTS and RCP	Operation phase	• Environmental Initiative

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S3.8.2	A6	The Contract shall exercise adequate precautionary measures to minimize any potential odour nuisance from tipping activities: • Planting rows of trees along the northern side of WENT Landfill Extension (ie slope toe) and along Nim Wan Road. • Providing a vehicle washing facility before the exit of the landfill and providing sufficient signage to remind Refuse Collection Vehicles (RCV) drivers to pass through the facility before leaving the landfill. • Reminding the RCV drivers to empty the liquor collection sump and close the valve before leaving the tipping face. • Washing down the area where spillage of RCV liquor is discovered promptly. • Reminding operators to properly maintain their RCVs properly and that liquor does not leak from the vehicles. • Installation of vertical and/or horizontal LFG extraction system to enhance extraction of LFG from the waste mass and hence minimise odour associated with fugitive LFG emissions. • Progressive / temporary restoration of the areas which reach the finished profile (a final capping system including an impermeable liner will be put in place) and installation of a permanent LFG extraction system. • Daily cover the compacted waste with 150mm of soil. • Covering the non-active phase with 300mm to 600mm of soil / an impermeable liner (on top of the intermediate cover), which will not only prevent odour emissions from landfilled waste but also enhance LFG extraction by the LFG extraction system. • Providing deodoriser for the LTP. • Enclosing all the leachate storage and treatment tanks and diverting the exhaust air from these tanks to a deodoriser to avoid potential odour emissions from the LTP. • As an improvement measure to enhance to environmental standard for waste transfer, EPD could take the initiative to recommend others to use enclosed type RCVs (dominantly government vehicles and sludge vehicles).	Minimize the potential odour impact for tipping area to nearby sensitive receivers	Contractor	Tipping areas	Operation and Restoration phases	• TM-EIA, Annex 4 • Odour patrol with 2 Odour Level or below at ASR without causing potential odour nuisance

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		• Cleaning / watering of the surface and clearing of the waste water receptor of government RCV is recommended before leaving refuse transfer station or government Refuse Collection Point (FEHD). • The trench for special waste shall be covered with soil immediately upon the disposal of special waste to reduce the odour emission. • For Waste requiring co-disposal (e.g., special waste) by trench, the open trench shall be covered with a mobile de-odouriser cover when the trench is not in use for waste disposal, including the time interval between two consecutive disposal operations. • The use of alternative daily cover (less permeable layer) instead of inert material should be considered under worst-case weather condition, subject to EM&A Programme. • The use of immediate daily cover for odorous waste such as animal waste etc. under critical condition should also be considered, subject to EM&A Programme. • In accordance with some reference from New Zealand, odour from active tipping area can be much reduced if the waste is covered by sandwich covering material such that it is confined in a solid/semi solid condition. Such covering material will be acted as sandwich protective layers to block the interaction of waste. Only diffusion mode (small scale) will be present. These would be applied during very hot and stable weather condition. Twice daily covering (mid day and close of business) can be arranged in case odour patrol identify potential odour nuisance, subject to EM&A Programme. • Posi-shell and/or other suitable materials will be applied to cover the active tipping face at the end of each operation day according to the Enhanced Scheme. • There will also be immediate cover of 300 mm thick soil on the special trench for special wastes.					

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S3.8.2	A6 (Con't)	• Continue to maintain the integrity of the capping system. • Provision of vertical and/or horizontal LFG extraction system to enhance extraction of LFG from the waste mass and hence minimise odour associated with fugitive LFG emissions. • Enclosing all the leachate storage and treatment tanks and diverting the exhaust air from these tanks to a deodoriser to avoid potential odour emissions from the LTP.	Minimize the potential odour impact for tipping area to nearby sensitive receivers	Contractor	Entire WENT Landfill Extension Site	Aftercare phase	• TM-EIA, Annex 4 • Odour patrol with 2 Odour Level or below at ASR without causing potential odour nuisance
Specific measure from VEP							
		• Regular watering on construction / restoration workfronts, haul roads, stockpiling areas etc (at least once per hour). • The quantity of explosive used at each time and spacing of shot holes shall be carefully designed. Blast nets, screens and other protective covers shall be adopted to prevent any fly rocks resulting from blasting activities. • The areas within 30 m from the blasting area will be wetted with water prior to blasting, • Blasting shall not be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted. Water spraying shall be conducted immediately after each blasting to avoid dispersion of dust. • For marine emissions, on-shore power supply shall be provided where practicable for the construction barges and marine vessels to power the cranes and other machinery on the barges / vessels at the berths to avoid emission from idling at the berth. • The crushers, including the inlets and outlets will be enclosed and ducted to a dust extraction and collection system such as fabric filter in accordance with "A Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plants) (BPM 11/1(95))". • All transfer points and conveyor belts will also be enclosed. • Water spraying system will be installed at all feeding and outlet areas to	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	Entire WENT Landfill Extension site	Construction and Restoration phases	• To control the dust impact to within the EM&A criteria (Ref. 1-hr and 24-hr TSP levels are 500μgm^{-3} and 260μgm^{-3}, respectively)

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		further suppress dust emission. The contractor shall also apply and obtain the license from EPD for operation of the rock crushing plants under the Air Pollution Control Ordinance and ensure the rock crushing plants designed and operated in accordance with BPM 11/1(95). • Posi-shell and/or other suitable materials will be applied to cover the active tipping face at the end of each operation day according to the Enhanced Scheme. • There will also be immediate cover of 300 mm thick soil on the special trench for special wastes.					

Notes :
Entire WENT Landfill Extension site includes Office, Waste Reception Area, Leachate Treatment Works, LFG Treatment Works, Active, Inactive and Restored Tipping Areas.

Appendix B2 – Noise

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Construction Noise							
S4.4.3.1	N1	Use of good site practices to limit noise emissions by considering the following: • 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; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	Control construction airborne noise by means of good site practices	Contractor	Entire site construction	Construction phase	• Noise Control Ordinance
S4.4.3.2	N2	Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	Reduce the noise levels of plant items	Contractor	Entire site construction	Construction phase	• Noise Control Ordinance & its TM • Annex 5, TM-EIA
Operation Noise							
S4.6.2	N3	Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	Reduce the noise levels of plant items	Contractor	Entire site construction	Operation and Restoration phases	• Noise Control Ordinance & its TM • Annex 5, TM-EIA
S4.6.2	N4	Build a noise bund of about 3.5m tall along the north eastern seafront of the existing WENT Landfill to provide a screening effect of at least 5dB(A) from the berths.	Reduce the noise levels of barges	Contractor	Existing Landfill WENT	Construction, operation and restoration phases	• Noise Control Ordinance & its TM • Annex 5, TM-EIA

Appendix B3 – Water Quality

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Construction Water Quality							
S5.6.7	W1	Construction Runoff • 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 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 site/sediment trap. The sediment/silt 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 ProPECC PN 2/23, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. • 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, or alternatively, within 14 days of the cessation of earthworks where practicable. 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. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they 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. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50 m^3 should be covered with tarpaulin or similar	Control construction runoff and erosion from site surface, drainage channel, stockpiles, barging facility, wheel washing facilities, etc to minimize water quality during construction stage	Contractor	Entire construct site	Construction phase	• ProPECC PN 2/23 • Water Pollution Control Ordinance

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		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 summarised in Appendix A2 of ProPECC PN 2/23. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. • 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 bay should be provided at every construction site exit. 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 access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors should be provided in the site 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. Requirements for solid waste management are detailed in Section 6 of this Report. • 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.					

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S5.6.7	W2	<u>Sewage Effluent from Workforce</u> • Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. • Notices will 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 can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	Control sewage effluent arising from the sanitary facilities provided for the onsite construction workforce	Contractor	On-site sanitary facilities	Construction phase	• ProPECC PN 2/23 • Water Pollution Control Ordinance • Waste Disposal Ordinance
S5.6.7	W3	<u>Accidental Spillage of Chemical</u> Any service workshop and maintenance facilities shall be located within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of equipment involving activities with potential for leakage and spillage will only be undertaken within the areas.	Control of chemical leakage	Contractor	Service workshop and maintenance facilities	Construction phase	• ProPECC PN 2/23 • Water Pollution Control Ordinance • Waste Disposal Ordinance

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Operation Water Quality							
S5.7.8	W4	<u>Erosion Control Measures</u> a. Preserve Natural Vegetation This Best Management Practices will involve preserving natural vegetation to the greatest extent possible during the construction process, and after construction where appropriate. Maintaining natural vegetation is the most effective and inexpensive form of erosion prevention control. b. Provision of Buffer Zone A buffer zone consists of an undisturbed area or strip of natural vegetation or an established suitable planting adjacent to a disturbed area that reduces erosion and runoff. The rooted vegetation holds soils acts as a wind break and filters runoff that may leave the site. c. Seeding (Temporary/Permanent) A well-established vegetative cover is one of the most effective methods of reducing erosion. Vegetation should be established on construction sites as the slopes are finished, rather than waiting until all the grading is complete. Besides, Hydroseeding will be applied on the surface of stockpiled soil and on temporary soil covers for inactive tipping areas to prevent soil erosion during rainy season. d. Ground Cover Ground Cover is a protective layer of straw or other suitable material applied to the soil surface. Straw mulch and/or hydromulch are also used in conjunction with seeding of critical areas for the establishment of temporary or permanent vegetation. Ground cover provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. e. Hydraulic Application Hydraulic application is a mechanical method of applying erosion control materials to bare soil in order to establish erosion-resistant vegetation on disturbed areas and critical slopes. By using hydraulic equipment, soil amendments, mulch, tackifying agents, Bonded Fiber Matrix (BFM) and liquid co-polymers can be uniformly broadcast, as homogenous slurry, onto the soil. These erosion and dust control materials can often be applied in one operation.	Erosion control	Contractor	Drainage system	Construction, Operation, Restoration and Aftercare phases	• ProPECC PN 2/23 • Water Pollution Control Ordinance

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		f. Sod Establishes permanent turf for immediate erosion protection and stabilizes rainageways. g. Matting There are numerous erosion control products available that can be described in various ways, such as matting, blankets, fabric and nets. These products are referred as matting. A wide range of materials and combination of materials are used to produce matting including, but not limited to: straw, jute, wood fiber, coir (coconut fiber), plastic netting, and Bonded Fiber Matrix. The selection of matting materials for a site can make a significant difference in the effectiveness of the Best Management Practices. h. Plastic Sheeting Plastic Sheeting will provide immediate protection to slopes and stockpiles. However, it has been known to transfer erosion problems because water will sheet flow off the plastic at high velocity. This is usually attributable to poor application, installation and maintenance. i. Dust Control Dust Control is one preventative measure to minimize the wind transport of soil, prevent traffic hazards and reduce sediment transported by wind and deposited in water resources.					
S5.7.8	W5	Temporary surface water drainage system will be provided to manage runoff during construction and operation. This system will consist of channels as constructed around the perimeter of the site area. This system will collect surface water from the areas of higher elevations to those of lower elevations and ultimately to the point of discharge. Erosion will therefore be minimised. The temporary surface water drainage system will include the use of a silt fence around the soil stockpile areas to prevent sediment from entering the system. Regular cleaning will be carried out to prevent blockage of the passage of water flow in silt fence. Intermediate drainage system will be installed for filled cell/phase. The major purpose of the intermediate drainage system is to prevent the clean surface water run-off from the filled phases coming into contact with the waste mass in active cell and to prevent excessive surface water infiltration through the intermediate cover, thus contribute to increasing volume of leachate. The intermediate drainage system will collect the clean surface water run-off and	Surface Water Manageme / Control run off	Contractor	Surface water system	Construction, Operation, Restoration and Aftercare phases	• Water Pollution Control Ordinance • TM-water

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		divert it to the permanent discharge channels connected to the public drainage system. In addition, surface flow from the haul road (especially near the wheel washing facility) will be collected to a dry weather flow interceptor and conveyed to the on-site leachate treatment plant for further treatment.					
S5.7.8	W6	Monitoring of the surface water discharges and groundwater discharge under the environmental monitoring programme.	Control run off and underground water leakage	Contractor	Surface and underground water system	Operation, Restoration and Aftercare phases	• Water Pollution Control Ordinance • TM-water
S5.7.8	W7	Formulate contingency Plan on Accidental Leakage of Leachate • Design Contingency Plan for Groundwater Contamination • Design Contingency Plan for Surface Water Contamination	Control contamination to surface and ground water	Contractor	Drainage system	Operation, Restoration and Aftercare phases	• TM-water • Water Pollution Control Ordinance

Appendix B4 – Waste Management

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Waste Management							
S6.5	WM1	C&D Materials Implement proper waste management measures during construction phase as stipulated in the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 Environmental Management in Construction Sites. Implement a trip-ticket system to ensure that the movement of C&D materials are properly documented and verified in accordance with TCW No. 6/2010. Copies/counterfoils from trip-tickets (with quantities of C&D Materials off-site) should be kept for record purposes. Appropriate waste management should be implemented in accordance with the ETWB TC(W) No 19/2005. Make provisions in Contract documents to allow and promote the use of recycled aggregates where appropriate. Careful design, planning and good site management to minimise overordering and waste materials such as concrete, mortars and cement grouts. The design of formwork should maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork or plastic fencing should be considered to increase the potential for reuse. The Contractor should recycle as much as possible the C&D waste on-site through proper waste segregation on-site. Concrete and masonry should be used as general fill and steel reinforcement bars can be used by scrap steel mills. Proper areas should be designated for waste segregation and storage wherever site conditions permit. Maximise the use of reusable steel formwork to reduce the amount of C&D material. Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement. On-site sorting and segregation facility of all type of wastes is considered as one of the best practice in waste management and hence, should be implemented in all projects generating construction waste. The sorted public fill and C&D waste should be properly reused. Excavated slope, stockpiled material and bund walls should be covered by tarpaulin until used in order to prevent wind-blown dust during dry weather, and to reduce muddy runoff during wet weather. Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. If any topsoil-like materials need to be stockpiled for any length of time,	Good site practice to minimise C&D waste generation and reuse/recycle all C&D on-site as far as possible	Contractor	Entire construction site	Construction phase	Waste Disposal Ordinance ETWB TC(W) No.19/2005 TCW No. 6/2010

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		consideration should be given to hydroseeding of the topsoil on the stockpile to improve its visual appearance and prevent soil erosion. Nomination of approved personnel to be responsible for good site practices and making arrangements for collection of all wastes generated on-site and effective disposal. Training of site personnel for cleanliness, proper waste management procedures including chemical waste handling, and waste reduction, reuse and recycling concepts. Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. Prior to disposal of C&D waste, wood, steel and other metals should be separated for re-use and/or recycling to minimise the quantity of waste to be disposed of to landfill. Proper storage and site practices should be implemented to minimise the potential for damage or contamination of construction materials. Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. Minimise excessive ordering of concrete, mortars and cement grout by doing careful check before ordering.					
S6.5	WM2	<u>Chemical Waste</u> Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Plant/equipment maintenance schedule should be designed to optimise maintenance effectiveness and to minimise the generation of chemical wastes. Where possible, chemical wastes (e.g. waste lube oil) should be recycled by licensed treatment facilities Containers used for storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD. Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulation. The storage area for chemical wastes should be clearly labelled and used solely for storage of chemical waste, enclosed with at least 3 sides, having an	Ensure proper disposal of chemical waste generated on-site to minimise the associated hazards on human health and environment	Contractor	Entire construction site	Construction, Operation, Restoration and Aftercare phases	Waste Disposal (Chemical Waste) General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		impermeable floor and bund of sufficient capacity to accommodate 110% of volume of the largest container or 20 % of total volume of waste stored in that area, whichever is the greatest, having adequate ventilation, being covered to prevent rainfall entering, and being arranged so that incompatible materials are adequately separated. Chemical waste should be collected by licensed waste collectors and disposed of at licensed facility, e.g. Chemical Waste Treatment Centre.					
S6.5	WM3	<u>General Refuse</u> General refuse generated on-site should be properly stored in enclosed bins or compaction units separately from construction and chemical wastes. All recyclable materials (separated from the general waste) should be stored on-site in appropriate containers with cover prior to collection by a local recycler for subsequent reuse and recycling. Residual, nonrecyclable, general waste should be stored in appropriate containers to avoid odour. Regular collection should be arranged by an approved waste collector in purpose-built vehicles that minimise environmental impacts during transportation Reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. Aluminum cans should be separated from general waste stream and collected by recyclers. Proper collection bins should be provided on-site to facilitate the waste sorting. Office waste paper should be recycled if the volume warrant collection by recyclers. Participation in community waste paper recycling programme should be considered by the Contractor, including waste paper, aluminum cans, plastic bottles, waste batteries, etc.	Minimise generation of general refuse to avoid odour, pest and visual nuisance	Contractor	Entire construction site	Construction, Operation, Restoration and Aftercare phases	Waste Disposal Ordinance
S6.5	WM4	<u>Sludge from Leachate Treatment Works</u> Sludge should be collected by a licensed collector at regular intervals, to suit the operation schedule of the leachate treatment plant. The use of purpose-built sludge tankers can minimise the potential of environmental impacts during transportation.	Proper management of sludge arising from leachate treatment works to minimise the associated hazards on human health and environment	Contractor	Leachate Treatment Works	Construction, Operation, Restoration and Aftercare phases	Waste Disposal Ordinance

Appendix B5 – Landfill Gas

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measu (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
LFG							
Within WENT Landfill Extension							
S7.6.1	LFG1	Special LFG precautions should be taken due to close proximity of WENT Landfill Extension site to existing landfill to avoid potential hazards of LFG exposure (ignition, explosion, asphyxiation, toxicity).	To minimise the risk of LFG hazards to personnel in construction site	Contractor	Entire WENT Landfill Extension site	Construction phase	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.1	LFG2	Prominent safety warning signs should be erected on-site to alert all personnel and visitors of LFG hazards during excavation works.					
S7.6.1	LFG3	No smoking or burning should be permitted on-site.					
S7.6.1	LFG4	Prominent 'No smoking' and 'No Naked Flames' signs should be erected on-site.					
S7.6.1	LFG5	No worker should be allowed to work alone at any time in excavated trenches or confined areas on-site.					
S7.6.1	LFG6	Adequate fire fighting equipment should be provided on-site.					
S7.6.1	LFG7	Construction equipment should be equipped with vertical exhaust at least 0.6m above ground installed with spark arrestors.					
S7.6.1	LFG8	Electrical motors and extension cords should be explosion-proof and intrinsically safe for use on-site.					
S7.6.1	LFG9	'Permit to Work' system should be implemented.					
S7.6.1	LFG10	Welding, flame-cutting or other hot works should be conducted only under 'Permit to Work' system following clear safety requirements, gas monitoring procedures and presence of qualified persons to supervise the works.					
S7.6.1	LFG11	For piping assembly or conduit construction, all valves and seals should be closed immediately after installation to avoid accumulation and migration of LFG. If installation of large diameter pipes (diameter >600mm) is required, the pipe ends should be sealed on one side during installation. Forced ventilation is required prior to operation of installed pipeline. Forced ventilation should also be required for works inside trenches deeper than 1m.					

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Measu (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S7.6.1	LFG12	Frequency and location of LFG monitoring within excavation area should be determined prior to commencement of works. LFG monitoring in excavations should be conducted at no more than 10mm from exposed ground surface.	To minimise the risk of LFG hazards to personnel in construction site	Contractor	Entire WENT Landfill Extension site	Construction phase	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.1	LFG13	For excavation works deeper than 1m, LFG monitoring should be conducted (1) at ground surface prior to excavation, (2) immediately before workers entering excavations, (3) at the beginning of each working day for the entire period of excavation remains open, and (4) periodically throughout the working day when workers are in the excavation.					
S7.6.1	LFG14	Any cracks on ground level encountered on-site should be monitored for LFG periodically. Appropriate action should be taken in accordance with the action plan in Table 7.8 of EIA Report.					
S7.6.1	LFG15	LFG precautionary measures involved in excavation and piping works should be provided in accordance with LFG Guidance Note and included in Safety Plan of construction phase. Temporary offices or buildings should be located where free LFG has been proven or raised clear of ground at a separation distance of at least 500mm.					
S7.6.1	LFG16	For large development such as WENT Landfill Extension, a Safety Officer trained in the use of gas detection equipment and LFGrelated hazards should be present on-site throughout the groundwork phase. The Safety Officer should be provided with an intrinsically safe portable instrument appropriately calibrated and capable of measuring the following gases: • CH_4: 0-100% LEL and 0-100% v/v • CO_2: 0-100% v/v • O_2: 0-21% v/v					

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S7.6.1	LFG17	Periodically during groundwork construction, the works area should be monitored for CH_4, CO_2 and O_2 using appropriately calibrated portable gas detection equipment. The monitoring frequency and areas should be established prior to commencement of groundwork either by Safety Officer or appropriately qualified person. Routine monitoring should be carried out in all excavations, manholes, chambers and any other confined spaces that may have been created by temporary storage of building materials on-site. All measurements in excavations should be made with monitoring tube located not more than 10mm from exposed ground surface.	To minimise the risk of LFG hazards to personnel in construction site	Contractor	Entire WENT Landfill Extension site	Construction phase	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.1	LFG18	For excavations deeper than 1m, measurements should be conducted: • At ground surface before excavation commences; • Immediately before any worker enters the excavation; • At the beginning of each working day for entire period the excavation remains open; and • Periodically throughout the working day whilst workers are in excavation.					
S7.6.1	LFG19	For excavations between 300mm and 1m, measurements should be conducted: • Directly after excavation has been completed; and • Periodically whilst excavation remains open.					
S7.6.1	LFG20	For excavations less than 300mm, monitoring may be omitted at the discretion of Safety Officer or appropriately qualified person.					
S7.6.1	LFG21	Where any service voids, manholes and inspection chambers within WENT Landfill Extension site are entered for maintenance and LFG monitoring, all safety requirements should be followed.	To minimise the risk of LFG hazards to personnel in landfill site	Contractor	Entire WENT Landfill Extension site	Construction, Operation, Restoration and Aftercare phases	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.1	LFG22	Buildings onsite should be incorporated with passive system relying on natural air movement to prevent gas build-up and active system requiring energy input to mechanically move air to protect against LFG build-up. Design measures for sub-surface building services should include generic measures e.g. gas barriers, gas vents and strategic routing of any service utilities away from potential LFG migration pathways.					

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S7.6.1	LFG23	Any new-built permanent building structures within the WENT Landfill Extension site, forced ventilation and gas detection system with audible alarm should be installed. When the internal atmosphere is detected with >10% of CH_4, forced ventilation should be triggered automatically. No person should be allowed to enter or remain in any confined areas when CO_2 levels >1.5% v/v or O_2 levels <18% v/v were detected. Access to confined spaces in the WENT Landfill Extension site should be controlled to only authorised persons.	To minimise the risk of LFG hazards to personnel in landfill site	Contractor	Entire WENT Landfill Extension site	Construction, Operation, Restoration and Aftercare phases	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.1	LFG24	Specific gas protection measures which can be applied to building services have been in Appendix 7.4 of EIA Report. They generally include gas barriers, gas vents, location of service entries above ground, and service conduits passing through Consultation Zone.					
S7.6.3	LFG25	The design of the landfill gas protection measures to be adopted onsite, e.g. utilities, buildings, LFG cut-off trench barrier, monitoring wells and facilities related to the WENT Landfill Extension project will be performed by a landfill gas specialist consultant appointed by the Contractor. Moreover, the landfill gas protection measures will be checked and certified by a qualified independent consultant. The contractor shall ensure that the required protective measures are implemented and constructed in accordance with the design and shall establish a maintenance and monitoring programme for ensuring the continual performance of the implemented protection measures. The above requirements shall be included in the tender documents of WENT Landfill Extension project. When the detailed design is available, the Contractor is required to undertake further landfill gas hazard assessment to take account of the more readily available detailed information to finalise the design of the landfill gas protection measures recommended in this report. During the future detailed design stage, a review of the preliminary qualitative LFG hazard assessment presented in the report will be carried out, a detailed qualitative LFG hazard assessment will be prepared and all the report together with the detailed design of gas protection measures will be submitted to EPD for vetting.	To ensure that the design of the landfill gas protection measures is in order and appropriate.	The Project Proponent, Contractor	Entire WENT Landfill Extension site	Detailed Design stage	

EIA Ref	EM&A Log Ref	Recommended Precautionary / Mitigation Mea (to be implemented when the trigger level is exceeded, where necessary)	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Outside WENT Landfill Extension							
S7.6.2	LFG26	Setting up a LFG cut-off trench barrier is one of the mitigation measures for preventing gas entering an area. Since there are no "design equations' for cut-off barrier specifications, it is therefore essential to seek expert recommendation before finalising the design detail of any cut-off barrier. LFG cut-off trench barrier should be built along the site boundary of the WENT Landfill Extension to prevent gas from entering an area, which is keyed into low permeability strata or extends at least 1m below the lowest groundwater level. To relieve the potential build up of gas, it may be necessary to install additional measures for venting the gas such as trenches filled with no-fines, granular material, e.g. gravel, connected to venting pipes which will provide a preferential pathway for the release of gas to atmosphere.	To cut off any gas migration from WENT Landfill Extension to the middle lagoo and T Park which falls into the 250m LFG consultation zone of WENT Landfill and its Extension.	Contractor	Outside WENT Landfill Extension site	Construction phase	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.2	LFG27	Sealing of fault line ends by grouting will be implemented. In the event that investigation works during the detailed design stage identify the presence of laterally persistent faults running beneath the landfill site, and leading towards sensitive receivers, the following works could be carried out: • Sealing of any surface exposures of the 'fault' feature exposed during the site formation works. This could be carried out through the application of a shotcrete cover prior to the placement of the landfill liner, which also acts as a barrier to landfill gas migration. • Ground treatment at the landfill boundary, comprising pressurized injection of grout within a series of inclined drillholes formed to intersect the fault at various depths. These would effectively form an impermeable barrier against the lateral migration of landfill gas along the fault line. • Adequate venting of landfill gases such that insufficient pressures develop to result in lateral or downward migration of gas.	To prevent gas migration through the fault line in particular to the existing Black Point Power Station.	Contractor	Outside WENT Landfill Extension site	Construction phase	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97) Factories and Industrial Undertakings (F&IU) (Confined Spaces) Regulations Code of Practice on Safety and Health at Work in Confined Spaces
S7.6.2	LFG28	LFG monitoring wells will be installed in the ground on the development side of the cut-off trench barrier to measure the concentration of methane and carbon dioxide. Setting up a LFG cut-off trench barrier is one of the mitigation measures for preventing gas entering an area. Since there are no "design equations' for cut-off barrier specifications, it is therefore	To determine the effectiveness of the cut-off trench barrier in preventing LFG migration.	Contractor	Outside WENT Landfill Extension site	Construction, Operation, Restoration and Aftercare phases	Landfill Gas Hazard Assessment Guidance Note (EPD/TR8/97).

		essential to seek expert recommendation before finalising the design detail of any cut-off barrier.					

Environmental Mitigation Implementation Schedule
WENT Landfill Extension

Appendix B6 – Landscape and Visual Impact

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location of Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
Landscape and Visual Impact							
S8.7	LV1	**Advanced screening tree planting (mitigation measures – MM1)** • Early planting using fast growing trees and tall shrubs at strategic locations within site to block major view corridors to the site from the VSRs, and to locally screen haul roads, excavation works and site preparation works. • Tree planting in standard tree size along the slope toe of WENT Landfill Extension.	To minimise the impact on existing vegetation retained by personnel in construction site To provide initiation on permanent landscape and visual mitigation measures	Contractor	Entire construction site	Construction and Operation phases	DEVB TC(W) No. 4/2020 – Tree Preservation ETWB TC(W) No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features WBTC No. 6/2011 – Maintenance of Man-made Slopes and Emergency Repair on Stability of Land
S8.7	LV2	**Boundary Green Belt planting (mitigation measures – MM2)** • Considerable planting belts proposed around the site perimeter and the construction of temporary soil bunds would screen the landfill operations to a certain degree. Fast growing and fire resistant plant species will be used.					
S8.7	LV3	**Temporary landscape treatment as green surface cover (mitigation measures – MM3)** • For certain areas where landfilling operations would have to be suspended temporarily for a certain period of time, simple temporary landscape treatment such as temporary green colour slope cover should be considered. The period of temporary suspended operation should be sufficiently explicit in order to undertake appropriate temporary landscape treatment. During construction and operation phases, synthetic covering material of green colour should also be used as a temporary slope cover where applicable. Given the extensive area of the proposed extension, development of the site should be divided into phases to minimize the visual impact.					
S8.7	LV4	**Existing tree preservation (mitigation measures – MM4)** • No trees should be felled or transplanted unless they are inevitably affected by the Project. Affected trees should be transplanted under circumstances where technically feasible. A tree survey report should be prepared and a tree felling application should be submitted to government during the detailed design stage for approval before site formation works commence. The numbers, locations, species and sizes of the trees to be transplanted or felled should be clearly addressed.					

Environmental Mitigation Implementation Schedule
WENT Landfill Extension

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location of Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
S8.7	LV5	**Sensible final contour grading (mitigation measures – MM5)** • The final landfill will provide a structurally stable and visually interesting landform, which is visually compatible with surrounding landscape and contoured to simulate adjacent undeveloped area. Introduction and continuation of natural features such as spurs, ridges and valleys will be considered where appropriate.	To minimise the visual impact on landfill.	Contractor	Entire construction site	Restoration and Aftercare phases	DEVB TC(W) No. 4/2020 – Tree Preservation ETWB TC(W) No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features WBTC No. 6/2011 – Maintenance of Man-made Slopes and Emergency Repair on Stability of Land
S8.7	LV6	**Sufficient cover soil of landfill final capping (mitigation measures – MM6)** • Sufficient cover soil of landfill final capping will be placed above the low-permeable layer and drainage layer, so as to sustain the proposed planting. The cover soil layer should be a minimum of 500mm in thickness for grassland, a minimum of 700mm for shrubland and 1000mm for woodland. Immediately after the completion of localized earthworks for the cover soil layer, the soil surface should be stabilized and greened by grass hydroseeding prior to subsequent landscape planting.	To provide site preparation for compensatory planting under the requirements of mitigation measures.	Contractor	Entire construction site	Restoration and Aftercare phases	
S8.7	LV7	**Landscape planting and maintenance (mitigation measures – MM7)** • Planting and maintenance to allow vegetation establishment to match the natural vegetation of the surroundings. • Seedlings of native tree species will be planted in the second phase. • Reprovision of mangroves in some suitable locations inside the project boundary for compensation. • Planting layout to establish a coherent pattern of woodland, shrubland and grassland vegetation. • In the approved WENTX EIA, 21 ha of woodland compensatory planting to be planted after restoration phase. The Enhanced Scheme would largely minimize encroachment onto the woodland resulting in a small area of loss only, i.e. 0.12 ha. In line with the same principle as the approved WENTX EIA (ratio = 5:1 in terms of area), the total compensatory woodland planting area should be around 0.60 ha.	To minimise the landscape and visual impact on the affected planting areas and provide permanent landscape planting under the mitigation measures	Contractor	Entire construction site	Restoration and Aftercare phases	

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location of Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
S8.7	LV8	**Woodland vegetation management (mitigation measures – MM8)** • Thinning of pioneer trees to be carried out in the period of 5-8 years after the establishment period for each phase of works. • It includes the selective removal of pioneer trees to provide more light and space between trees that is beneficial for growth and natural regeneration of native trees in the woodland planting mix. • Proper maintenance and management for woodland planting is required to provide good quality of compensatory planting. During establishment period of the woodland planting, proper inspection of the death rate of each species in terms of quantity shall be provided and stated in Environmental Permit that forms part of DBO contract.	To maintain the compensatory woodland planting effectively for mitigation measures.	Contractor	Entire construction site	Restoration and Aftercare phases	

Appendix C7 – Cultural Heritage

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location of Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
Cultural Heritage Impact							
Construction and Operation Phases							
Under the Enhanced Scheme, the revised boundary will totally avoid encroachment onto the Tsang Tsui Site of Archaeological Interest, graves and temple. No potential cultural heritage impact due to the Project is anticipated, and thus no mitigation measures are required for the Enhanced Scheme.							

Appendix C8 – Ecology

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
Ecology							
General Protection Measures:							
S10	E1	Restriction of construction activities to the work areas that would be clearly demarcated.	To minimise environmental impacts and therefore potential ecological impacts within and near the construction site	Contractor	Entire construction site	Construction Phase	Practice Note for Professional Persons (ProPECC), Construction Site Drainage (PN2/23) Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes, EPD (2022) ETWB TC(W)) No. 33/2002 Management of Construction and Demolition Material Including Rock TCW No. 6/2010 Trip Ticket System for Disposal of Construction and Demolition Materials ETWB TC(W) No. 15/2003 Waste Management on Construction Sites WBTC No.12/2002, Specifications Facilitating the Use of Recycled Aggregates WBTC Nos. 25/99, 25/99A and 25/99C. Incorporation of Information on Construction and Demolition Material Management in Public Works Subcommittee Papers
S10	E2	Reinstatement of the work areas immediately after completion of the works.					
S10	E3	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme.					
S10	E4	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.					
S10	E5	Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs.					
S10	E6	Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works.					
S10	E7	Mobile plant should be sited as far away from NSRs as possible and practicable.					
S10	E8	Material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.					
S10	E9	Use of “quiet” plant and working methods.					
S10	E10	Construction phase mitigation measures in the Practice Note for Professional Persons on Construction Site Drainage.					
S10	E11	Design and set up of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction.					
S10	E12	Design and incorporation of silt/sediment traps in the permanent drainage channels to enhance deposition rates and regular removal of deposited silt and grit.					

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
S10	E13	Minimization of surface excavation works during the rainy seasons (April to September), and in particular, control of silty surface runoff during storm events, especially for areas located near steep slopes.					
S10	E14	Regular inspection and maintenance of all drainage facilities and erosion and sediment control structures to ensure proper and efficient operation at all times and particularly following rainstorms.					
S10	E15	Provision of oil interceptors in the drainage system downstream of any oil/fuel pollution sources.					
Specific Mitigation Measures:							
S10	E17	Survey and transplantation plant species of conservation concern before site clearance, and 2 years of monitoring after transplantation. During the latest field survey in January 2024 and the Transplantation and Management Plan, only three groups of Nepenthes mirabilis (Pitcher Plant) were found and feasible to be transplanted.	To minimise loss of plant species of conservation concern	Contractor	Within and construction site	Before commencement of construction phase	N/A
S10	E18	0.60 ha of woodland compensatory planting after restoration phase. 10-year ecological monitoring of compensatory woodland planting during the after-care phases	To mitigate loss of woodland habitat	Contractor	Entire construction site	Restoration and Aftercare phase	N/A
S10	E20	Survey and translocation of the three fish species of conservation interest before site clearance, including *Squaliobarbus curriculus*, *Osteochilus vittatus* and *Kuhlia marginata*	To provide precautionary measure for fish species of conservation concern	Contractor	Within and near Construction site	Before commencement of construction phase	
S10	E21	Set up water quality monitoring station at Tai Shui Hang Stream	To provide precautionary measure for fish species of conservation concern	Contractor	Tai Shui Hang Stream	Before commencement of construction phase	

Appendix B9 – Pulverized Fuel Ash Impact

EIA Ref	EM&A Log Ref	Recommended Mitigation Measures (to be implemented when the trigger level is exceeded, where necessary)	Objectives of Recommended Measures & Main Concerns to Address	Who to Implement Measures?	Location of Measures	When to Implement Measures?	What Requirements or Standards for Measures to Achieve?
Pulverized Fuel Ash Impact							
Construction and Operation Phases							
S11.5	PF1	Recommended measures/ good practices are to be considered	To control radon health risk	Contractor	Entire WENT Landfill Extension site	Construction and Operation phases	ProPECC Note PN 1/99 Control of Radon Concentration in New Buildings