

South East New Territories (SENT) Landfill Extension

Monthly Environmental Monitoring & Audit Report No.65 for May 2024

PREPARED FOR



Green Valley Landfill Ltd.

DATE 11 September 2024

REFERENCE 0465169





South East New Territories (SENT) Landfill Extension

Environmental Certification Sheet EP-308/2008/C and FEP-01/308/2008/C

Reference Document/Plan

Monthly Environmental Monitoring & Audit Report

Document/Plan to be Certified/Verified: No.65 for May 2024 for South East New Territories

(SENT) Landfill Extension

Date of Report: 11 September 2024

Reference EP Condition

EP Condition: Condition No. 3.4

Four hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 10 working days after the end of the reporting month. The EM&A Reports shall include a summary of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be verified by the IEC. Additional copies of the submission shall be provided to the Director upon request by the Director.

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-308/2008/C and FEP-01/308/2008/C.

Terence Fong,

Environmental Team Leader:

(ERM Hong-Kong, Limited)

Date: 11 September 2024

Date: 11 September 2024

IEC Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-308/2008/C and FEP-01/308/2008/C.

Claudine Lee,

Independent Environmental

Checker:

(Meinhardt Infrastructure and

Environment Limited)

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South East New Territories (SENT) Landfill Extension

Monthly Environmental Monitoring & Audit Report No.65 for May 2024

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2



CLIENT: Green Valley Landfill Ltd.
PROJECT NO: 0465169 DATE: 11 September 2024 VERSION: 0 Page ii

EXECUTIVE SUMMARY

The SENT Landfill Extension (SENTX) forms an integral part in the Strategic Plan in maintaining the continuity of landfill capacity in the Hong Kong for the cost-effective and environmentally satisfactory disposal of waste. ERM-Hong Kong, Limited (ERM) is commissioned to undertake the role of Environmental Team (ET) for the construction, operation/restoration and aftercare of SENTX Project ("the Project") in accordance with the requirements specified in the Environmental Permit (EP), updated Environmental Monitoring and Audit (EM&A) Manual, the approved Environmental Impact Assessment (EIA) Report of the Project taking account of the latest design and other relevant statutory requirements. The construction (not including works related to site clearance and preparation) and operation of the Project commenced on 2 January 2019 and 21 November 2021, respectively.

This Monthly EM&A report presents the EM&A works carried out during the period from 1 to 31 May 2024 for the Project in accordance with the updated EM&A Manual.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR AIR QUALITY

One exceedance of Limit Levels for landfill gas flare stack emission (Benzene) was recorded for air quality monitoring in the reporting period. The landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 was considered Project-related upon further investigation.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR NOISE

No exceedance of Action and Limit Levels for operation/restoration phase noise monitoring was recorded in the reporting period.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR WATER QUALITY

Two exceedances of the Limit Levels for surface water (Ammoniacal-nitrogen and Suspended Solids (SS)), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and two exceedances of the Limit Levels for groundwater (Chemical Oxygen Demand (COD)) were recorded for water quality monitoring in the reporting period. The surface water (Ammoniacalnitrogen) exceedance at DP3 and the surface water (SS) exceedance at DP6 on 6 May 2024 were considered Project-related upon further investigation. The monitoring frequency shall be increased to weekly in accordance with Table 4.5b of the updated EM&A Manual until no exceedance of Limit Level. However, the Ammoniacal-nitrogen results at DP3 of the additional monitoring event conducted on 30 May 2024 are well below the Limit Level and the weekly surface water monitoring at DP3 was therefore not triggered. Weekly surface water quality monitoring (SS) shall be continued at DP6 in the next reporting period until no exceedance of Limit Level. The groundwater (ammoniacal-nitrogen) exceedance at MWX-5 and the groundwater (COD) exceedances at MWX-5 and MWX-6 on 3 May 2024 were considered non Project-related upon further investigation.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR LANDFILL GAS

No exceedance of Action and Limit Levels for operation/restoration phase landfill gas monitoring was recorded in the reporting period.



ENVIRONMENTAL COMPLAINTS, SUMMONS AND PROSECUTIONS

There were no complaints, notification of summons or prosecution recorded in the reporting period.

REPORTING CHANGE

There was no reporting change in the reporting period.

FUTURE KEY ISSUES

Potential environmental impacts arising from the upcoming construction/ operational activities in the next reporting period of June 2024 are mainly associated with potential surface water impact in the rainy season.



CLIENT: Green Valley Landfill Ltd.
PROJECT NO: 0465169 DATE: 11 September 2024

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1. INTRODUCTION

1.1 BACKGROUND

The SENT Landfill Extension (SENTX) forms an integral part in the Strategic Plan in maintaining the continuity of landfill capacity in the Hong Kong for the cost-effective and environmentally satisfactory disposal of waste. The *Environmental Impact Assessment (EIA) Report* and the associated *Environmental Monitoring and Audit (EM&A) Manual* for the construction, operation, restoration and aftercare of the SENTX (hereafter referred to as "the Project") have been approved under the *Environmental Impact Assessment Ordinance (EIAO)* in May 2008 (Register No.: AEIAR-117/2008) (hereafter referred to as the approved EIA Report) and an Environmental Permit (EP-308/2008) (EP) was granted by the Director of Environmental Protection (DEP) on 5 August 2008.

Since then, applications for Variation of an Environmental Permit (No. VEP-531/2017) were submitted to EPD and the Variation of Environmental Permits (EP-308/2008/A and EP-308/2008/B) were granted on 6 January 2012 and 20 January 2017, respectively, as the Hong Kong SAR Government has decided to reduce the scale of the design scheme of SENTX assessed in the approved EIA Report and SENTX will only receive construction waste. In May 2018, a Further Environmental Permit (FEP) (FEP-01/308/2008/B) was granted to the SENTX's contractor, Green Valley Landfill, Limited (GVL). In February 2024, VEPs (EP-308/2008/C and FEP-01/308/2008/C) were granted to the Environmental Infrastructure Division of EPD and GVL, regarding updates on alternative measures to minimise surface odour emission.

ERM-Hong Kong, Limited (ERM) and Meinhardt Infrastructure and Environment Limited (Meinhardt) are commissioned to undertake the roles of Environmental Team (ET) and the Independent Environmental Checker (IEC), respectively, to undertake the EM&A activities for the Project in accordance with the requirements specified in the EP, updated EM&A Manual ⁽¹⁾, approved EIA Report ⁽²⁾ taking account of the latest design and other relevant statutory requirements.

1.2 PROJECT DESCRIPTION

The SENTX is a piggyback landfill, occupying the southern part of the existing SENT Landfill (including its infrastructure area) and 13 ha of Tseung Kwan O (TKO) Area 137. A layout plan of the SENTX is shown in **Figure 1.1**. Under the latest design, the SENTX has a net void capacity of about 6.5 Mm³ and provides an additional lifespan of about 6 years, commencing operation upon exhaustion of the SENT Landfill. The SENTX will receive construction waste only.

The key implementation milestones of the Project are indicatively summarised in **Table 1.1**. The construction works and operation of the Project commenced on 2 January 2019 and 21 November 2021, respectively.

⁽²⁾ ERM (2007). South East New Territories (SENT) Landfill Extension – Feasibility Study: Environmental Impact Assessment Report



⁽¹⁾ ERM (2018). South East New Territories (SENT) Landfill Extension: Environmental Monitoring & Audit Manual

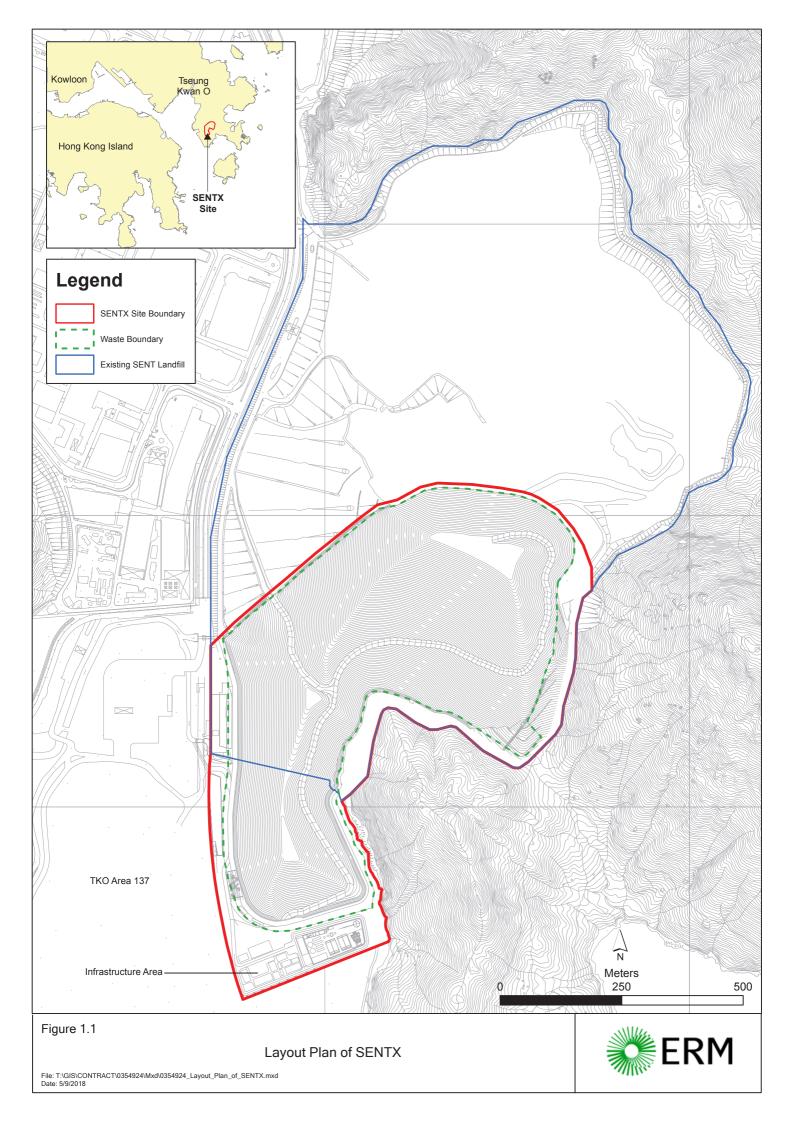


TABLE 1.1 ESTIMATED KEY DATES OF IMPLEMENTATION PROGRAMME

Key Stage of the Project	Indicative Date
Start construction	2 January 2019
Commissioning of new infrastructure facilities	2020
Demolition of existing infrastructure facilities	2021
Start waste intake at SENTX	21 November 2021
Estimated exhaustion date of. SENTX	2027
End of aftercare for SENTX	2059

The major construction works of the SENTX includes:

- Site formation at the TKO Area 137 and the existing infrastructure area at SENT Landfill;
- Construction of surface and groundwater drainage systems;
- Construction of the leachate containment and collection systems;
- Construction of new leachate and landfill gas treatment facilities, site offices, maintenance yards at the new infrastructure area;
- Construction of new pipelines to transfer the leachate and landfill gas collected from the existing SENT Landfill to the treatment facilities at the new infrastructure area;
- · Construction of the site access and new waste reception facilities; and
- Demolition of the facilities at the existing SENT Landfill infrastructure area.

1.3 SCOPE OF THE EM&A REPORT

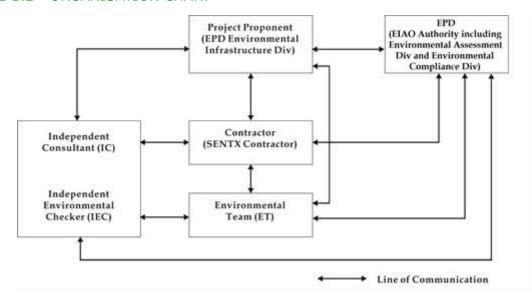
This is the Monthly EM&A Report for the Project which summarises the key findings of the EM&A programme during the reporting period from 1 to 31 May 2024 for the construction and operation works.

1.4 PROJECT ORGANISATION

The organisation structure of the Project is presented in **Figure 1.2**.



FIGURE 1.2 ORGANISATION CHART



Contact details of the key personnel are summarised in **Table 1.2** below.

TABLE 1.2 CONTACT INFORMATION OF KEY PERSONNEL

Party	Position	Name	Telephone
Contractor (Green Valley Landfill Limited)	Project Manager	Carl Lai	2706 8829
Environmental Team (ET) (ERM-Hong Kong, Limited)	ET Leader	Terence Fong	2271 3156
Independent Environmental Checker (IEC) (Meinhardt Infrastructure and Environment Limited)	IEC	Claudine Lee	2859 5409

1.5 SUMMARY OF CONSTRUCTION WORKS

The programme of the construction is shown in **Annex A**. As informed by the Contractor, the major works carried out in this reporting period include:

- Maintenance and improvement of temporary surface water drainage; and
- Restoration of Phase 1 Cell 1X, 2X and Phase 2 Cell 3X west slopes.

The implementation schedule of the mitigation measured recommended in the Updated EM&A Manual is presented in **Annex B**.

1.6 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The status for all environmental aspects are presented in **Table 1.3**. The EM&A requirements remained unchanged during the reporting period.



TABLE 1.3 SUMMARY OF STATUS FOR THE ENVIRONMENTAL ASPECTS UNDER THE **UPDATED EM&A MANUAL**

Parameters	Status			
Air Quality				
Baseline Monitoring	The results of baseline air quality monitoring were reported in Baseline Monitoring Report and Preoperation Baseline Monitoring Report and submitted to EPD under EP Condition 3.3			
Impact Monitoring	On-going			
Noise				
Baseline Monitoring	The results of baseline noise monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.3			
Impact Monitoring	On-going			
Water Quality				
Baseline Monitoring	The results of baseline surface water quality monitoring were reported in Baseline Monitoring Report and Pre-operation Baseline Monitoring Report and submitted to EPD under EP Condition 3.3			
Impact Monitoring	On-going			
Landfill Gas				
Impact Monitoring	On-going			
Waste Management				
Waste Monitoring	On-going			
Landscape and Visual				
Baseline Monitoring	The results of baseline landscape and visual monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.3			
Operation Phase Audit	On-going			
Site Environmental Audit				
Regular Site Inspection	On-going			
Complaint Hotline and Email Channel	On-going			
Environmental Log Book	On-going			

Taking into account the operation works, impact monitoring of air quality, noise, water quality, landfill gas and waste management were carried out in the reporting period. The impact monitoring schedule of air quality, noise, water quality and landfill gas monitoring are provided in Annex C.

The EM&A programme also involved environmental site inspections and related auditing conducted by the ET for checking the implementation of the required environmental mitigation measures recommended in the approved EIA Report and relevant EP submissions. To promote



the environmental awareness and enhance the environmental performance of the contractors, environmental trainings and regular environmental management meetings were conducted during the reporting period, which are summarized as below:

- One environmental management meeting was held with the Contractor, ET, IEC and EPD on 23 May 2024; and
- Environmental toolbox trainings on Renewable Energy and Chemical Waste Handling were provided on 16 May 2024 and 21 May 2024, respectively by the Contractor to the workers.

1.7 STATUS OF STATUTORY ENVIRONMENTAL COMPLIANCE WITH THE ENVIRONMENTAL PERMIT

The status of statutory environmental compliance with the EP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures are presented in **Table 1.4**.

TABLE 1.4 STATUS OF SUBMISSIONS REQUIRED UNDER THE EP AND IMPLEMENTATION STATUS OF MITIGATION MEASURES

EP Condition	Submission / Implementation Status	Status	
2.3	Management Organisation of Main Construction Companies	Submitted and accepted by EPD.	
2.4	Setting up of Community Liaison Group	Community Liaison Group was set up.	
2.5	Submission of Detailed Landfill Gas Hazard Assessment Report	Submitted and accepted by EPD on 10 January 2019.	
2.6	Submission of Restoration and Ecological Enhancement Plan	Submitted to EPD on 28 June 2019.	
2.7	Setting up of Trial Nursery	Trial Nursery works was commenced on 28 August 2019.	
2.8	Advance Screen Planting	Advance Screen Planting works were completed on 28 June 2019.	
2.9	Provision of Multi-layer Composite Liner System	Under implementation.	

1.8 STATUS OF OTHER STATUTORY ENVIRONMENTAL REQUIREMENTS

The environmental licenses and permits (including EP, *Water Pollution Control Ordinance* (WPCO) discharge license, registration as a chemical waste producer, and construction noise permit) that are valid in the reporting period are presented in **Table 1.5**. No non-compliance with environmental statutory requirements was identified.



TABLE 1.5 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS

Description	Ref No.	Status
Environmental Permit	EP-308/2008	Granted on 5 August 2008
Variation of Environmental Permit	EP-308/2008/A	Granted on 6 January 2012
	EP-308/2008/B	Granted on 20 January 2017
	EP-308/2008/C	Granted on 29 February 2024
Further Environmental Permit	FEP-01/308/2008/B	Granted on 16 May 2018
	FEP-01/308/2008/C	Granted on 29 February 2024
Water Discharge License under WPCO (Permit Holder: GVL)	Licence No.: WT00041447- 2022	Validity from 17 June 2022 to 30 June 2024
Billing Account for Disposal of Construction Waste	Chit Account Number: 5001692	Approved on 28 December 2005
Registration as a Chemical Waste Producer (Permit Holder: GVL)	5296-839-G2228-01	Issued on 31 December 2015
Construction Noise Permit (Permit Holder: GVL)	GW-RE0307-24	Validity from 22 March 2024 to 14 September 2024



EM&A RESULTS

The EM&A programme for the Project required environmental monitoring for air quality, noise, water quality and landfill gas as well as environmental site inspections for air quality, noise, water quality, landfill gas, waste management, and landscape and visual impacts. The EM&A requirements and related findings for each component are summarised in the following sections.

2.1 AIR QUALITY MONITORING

2.1.1 DUST MONITORING

2.1.1.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact dust monitoring (in term of Total Suspended Particulates (TSP)) was carried out at the four designated locations along the site boundary (i.e. AM1, AM2, AM3 and AM4) during the operation/restoration phase, at a 6-day interval.

The Action and Limit Levels of the dust monitoring is provided in **Table 2.1** below.

TABLE 2.1 ACTION AND LIMIT LEVELS FOR 24-HOUR TSP

Monitoring Station	Action Level	Limit Level
AM1 - SENTX Site Boundary (North)		
AM2 - SENTX Site Boundary (West, near DP3)	- 260 μg m-³	260 μg m- ³
AM3 - SENTX Site Boundary (West, near RC15)		
AM4 - SENTX Site Boundary (West, near EPD building)		

High volume air samplers (HVSs) in compliance with the specifications listed under Section 3.2.2 of the updated EM&A Manual were used to measure 24-hour TSP levels at the dust monitoring stations. The HVSs were calibrated upon installation and thereafter at bi-monthly intervals to check the validity and accuracy of the results.

The equipment used in the impact dust monitoring programme and monitoring locations are summarised in **Table 2.2** and illustrated in **Figure 2.1**, respectively. Copies of the calibration certificates for the equipment are presented in **Annex D1**.



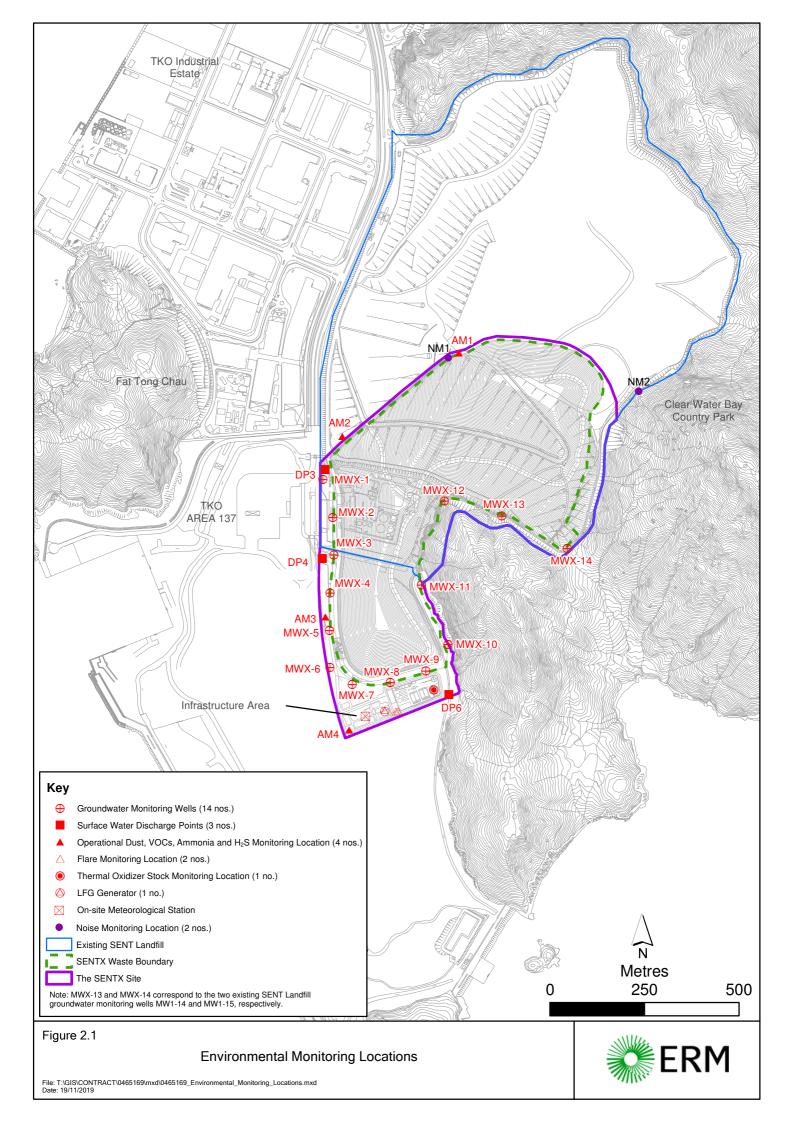


TABLE 2.2 DUST MONITORING DETAILS

Monitoring Station	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
AM1	SENTX Site Boundary (North)	24-hour TSP	Once every 6 days	1, 7, 13, 19, 25, 31 May 2024	Tisch TE-5170 (S/N: 3976)
AM2	SENTX Site Boundary (West, near DP3)				Tisch TE-5170 (S/N: 3573)
AM3	SENTX Site Boundary (West, near RC15)				Tisch TE-5170 (S/N: 3572)
AM4	SENTX Site Boundary (West, near EPD building)				Tisch TE-5170 (S/N: 3957)

2.1.1.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for dust monitoring during the reporting period is provided in **Annex C**.

2.1.1.3 RESULTS AND OBSERVATIONS

The monitoring results for 24-hour TSP are summarised in **Table 2.3**. The detailed monitoring results and the graphical presentation of the 24-hour TSP results at each monitoring location are provided in **Annex D2**.

TABLE 2.3 SUMMARY OF 24-HOUR TSP MONITORING RESULTS IN THE REPORTING PERIOD

Monitoring Station Location	Average 24-hr TSP Concentration (µg m ⁻³) (Range in bracket)	Action Level (μg/m³)	Limit Level (μg/m³)
AM1 - SENTX Site Boundary (North)	108 (32 - 241)	260	260
AM2 - SENTX Site Boundary (West, near DP3)	98 (41 – 167)	260	260
AM3 - SENTX Site Boundary (West, near RC15)	127 (28 – 242)	260	260
AM4 - SENTX Site Boundary (West, near EPD building)	61 (28- 104)	260	260

The major dust sources in the reporting period included fugitive dust emission from exposed area in SENTX as well as nearby operations of the TKO Area 137 Fill Bank.

No Action and Limit Levels exceedance was recorded for TSP monitoring in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D3**.



2.1.1.4 METEOROLOGICAL DATA

Meteorological data obtained from the SENTX on-site meteorological monitoring station was used for the dust monitoring and is shown in **Annex D4**. It is considered that meteorological data obtained at the on-site meteorological monitoring station is representative of the Project area and could be used for the operation/restoration phase dust monitoring programme for the Project.

2.1.2 ODOUR MONITORING

2.1.2.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, odour patrol was carried out along the site boundary during the operation/ restoration phase.

During the first month of operation, daily odour patrol (3 times per day) was conducted jointly by the ET and the IEC. The odour intensity detected was based on that determined by the IEC. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC three times per week. During these patrols, the odour intensity detected was based on that determined by the independent third party.

Reduction of odour monitoring frequency from Period 1 (daily, three times per day) to Period 2 (weekly) was approved by EPD on 4 February 2022. Weekly odour patrol was conducted jointly by the ET and the IEC from 10 February 2022. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC once every two weeks.

Reduction of odour monitoring frequency from Period 2 (weekly) to Period 3 (monthly) was approved by EPD on 2 June 2022. Monthly odour patrol was conducted jointly by the ET and the IEC from 28 June 2022. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC quarterly.

The Action and Limit Levels for odour patrol is provided in **Table 2.4** below.

TABLE 2.4 ACTION AND LIMIT LEVELS FOR ODOUR PATROL

Parameter	Action Level	Limit Level
Perceived odour intensity and odour complaints	 Odour intensity ≥ Class 2 recorded; or One documented complaint received 	 Odour intensity ≥ Class 3 recorded on 2 consecutive patrol (a) (b)

Notes:

- (a) i.e. either Class 3-strong or Class 4-extreme odour intensity.
- (b) The exceedances of the odour intensity do not need to be recorded at the same location.

Odour patrol was conducted by trained personnel/competent persons with a specific sensitivity to a reference odour (i.e. on reference materials n-butanol with the concentration of 50ppm in nitrogen (v/v)) in compliance with Section 3.7.2 of the updated EM&A Manual patrolling and sniffing along the SENTX Site boundary to detect any odour.

The odour monitoring programme and patrol route are summarised in **Table 2.5** and illustrated in **Figure 2.2** respectively. Copies of the certificates of the qualified odour panelist are presented in **Annex D5**.



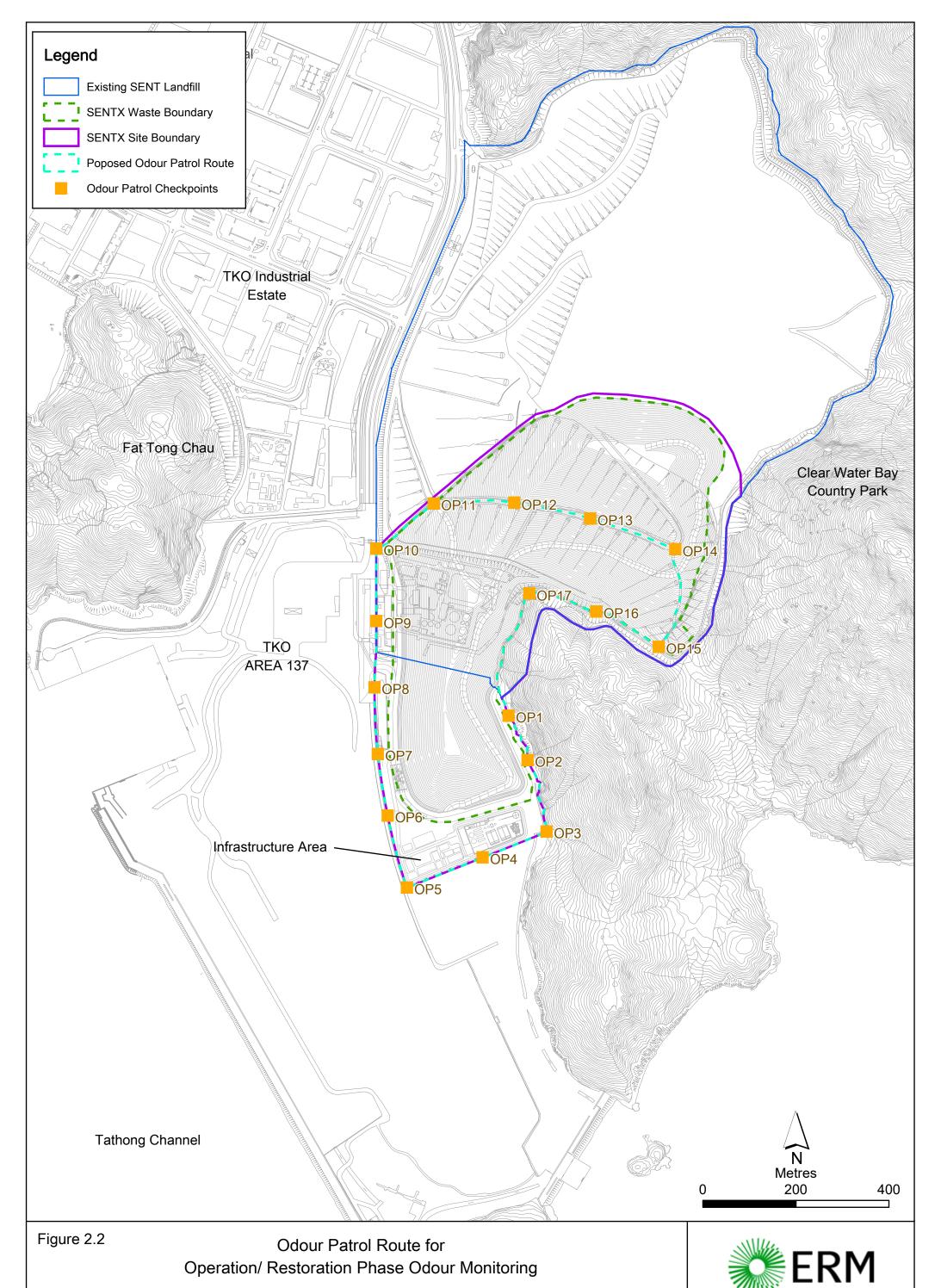
TABLE 2.5 ODOUR MONITORING DETAILS

Patrol Locations	Parameters	Patrol Frequency (a)	Monitoring Dates
Patrol Locations Patrol along the SENTX Site Boundary (Checkpoints OP1 - OP17)	Parameters Odour Intensity (see Table 2.6)	Period 1 - First month of operation Daily, three times a day in the morning, afternoon and evening/night (between 18:00 and 22:00 hrs) conducted by the ET and the IEC Three times per week on different days conducted by an independent third party together with the ET and IEC (b) Period 2 - Three months following period 1 (c) Weekly conducted by the ET and the IEC Once every two weeks conducted by an independent third party together with the ET and IEC Period 3 - Throughout operation following period 2 (c) Monthly conducted by the ET	Conducted by ET & IEC: 21 May 2024 Conducted by an independent third party, ET & IEC: -
		and the IEC Quarterly conducted by an independent third party together with the ET and IEC (b)	

Notes:

- (a) Reduction of monitoring frequency will be subject to the monitoring results to demonstrate environmentally acceptable performance.
- (b) Patrol shall be scheduled so that they are carried out together with the patrols to be carried out jointly by the ET and the IEC.
- (c) Commencement of each period will be justified by the ET Leader and verified by the IEC and will be subject to agreement with the EPD (EIAO Authority) and Project Proponent.





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TABLE 2.6 ODOUR INTENSITY LEVEL

Class	Odour Intensity	Description
0	Not Detected	No odour perceived or an odour so weak that it cannot be easily characterised or described.
1	Slight	Identified odour, slight
2	Moderate	Identified odour, moderate
3	Strong	Identified odour, strong
4	Extreme	Severe odour

2.1.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for odour patrol during the reporting period is provided in **Annex C**.

2.1.2.3 RESULTS AND OBSERVATIONS

The odour monitoring results are summarised and provided in Table 2.7 and Annex D6, respectively.

TABLE 2.7 SUMMARY OF ODOUR MONITORING RESULTS IN THE REPORTING PERIOD

Odour Checkpoints	Odour Intensity Class	Action Level	Limit Level
OP1	0	Odour intensity ≥ Class 2 recorded	Odour intensity ≥ Class 3 recorded on 2 consecutive patrol
OP2	0		
OP3	0		
OP4	0		
OP5	0		
OP6	0		
OP7	0		
OP8	0		
OP9	0		
OP10	0		
OP11	1		
OP12	1		
OP13	0		
OP14	0		



Odour Checkpoints	Odour Intensity Class	Action Level	Limit Level
OP15	N/A ^(a)		
OP16	N/A ^(a)		
OP17	N/A ^(a)		

Note:

(a) OP15 - OP17 are not accessible due to safety considerations.

The potential odour source in the reporting period included the Cell 4X tipping area at SENTX. All the odour monitoring results were below the Action and Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D3**.

2.1.3 THERMAL OXIDISER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING

2.1.3.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, the performance of the thermal oxidiser, landfill gas flare and landfill gas generator was monitored when they are in operation. Gas samples were collected from the stack of the thermal oxidizer, landfill gas flare and landfill gas generator for laboratory analysis for NO₂, CO, SO₂, Benzene and Vinyl chloride and in-situ analysis for exhaust gas velocity at monthly interval and for laboratory analysis for nonmethane organic compounds and ammonia (for thermal oxidizer only) at quarterly interval. The operating conditions of the thermal oxidiser, landfill gas flare and landfill gas generator were also monitored continuously.

The Limit Levels for stack emission of the thermal oxidiser, landfill gas flare and landfill gas generator are provided in **Tables 2.8 – 2.10** below.

TABLE 2.8 LIMIT LEVELS FOR STACK EMISSION OF THE THERMAL OXIDISER

Limit Level
1.58 gs ⁻¹
0.53 gs ⁻¹
0.07 gs ⁻¹
3.01 x 10 ⁻² gs ⁻¹
2.23 x 10 ⁻³ gs ⁻¹
850°C (minimum)
443K (minimum) ^(a)
7.5 ms ⁻¹ (minimum) ^(a)

Note:

(a) Level under full load condition.



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TABLE 2.9 LIMIT LEVELS FOR STACK EMISSION OF THE LANDFILL GAS FLARE

Parameters	Limit Level
NO ₂	0.97 gs ⁻¹
СО	2.43 gs ⁻¹
SO ₂	0.22 gs ⁻¹
Benzene	4.14 x 10 ⁻⁴ gs ⁻¹
Vinyl chloride	2.60 x 10 ⁻⁴ gs ⁻¹
Gas combustion temperature	815°C (minimum)
Exhaust gas exit temperature	923 K (minimum) ^(a)
Exhaust gas velocity	9.0 m s ⁻¹ (minimum) ^(a)

Note:

(a) Level under full load condition.

TABLE 2.10 LIMIT LEVELS FOR STACK EMISSION OF THE LANDFILL GAS GENERATOR

Limit Level
1.91 gs ⁻¹
2.48 gs ⁻¹
0.528 gs ⁻¹
2.47 x 10 ⁻⁴ gs ⁻¹
1.88 x 10 ⁻⁵ gs ⁻¹
450°C (minimum)
723K (minimum) ^(a)
30.0 ms ⁻¹ (minimum) ^(a)

Note:

(a) Level under full load condition.

Gas samples were collected from the centroid of the stack with stainless steel sampling probe, into inert sample containers (i.e. Canister and Tedlar Bag) and transferred to ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) laboratory within 24 hours of collection for direct analysis on a gas chromatography within 48 hours after collection. The flue gas velocity of the gas stream at the exhaust of thermal oxidize was determined by S-Pitot tube during the emission sampling.

The stack emission monitoring programme and monitoring locations are summarised in **Table 2.11** and illustrated in **Figure 2.1**, respectively.



TABLE 2.11 THERMAL OXIDISER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING DETAILS

Monitoring Location	Parameter	Frequency	Monitoring Date
Stack of Thermal Oxidiser	Laboratory analysis for • NO ₂ • CO • SO ₂ • Benzene • Vinyl chloride In-situ analysis for • Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	10 May 2024
	Laboratory analysis for Non-methane organic compounds CO	Quarterly for the 1 st year of operation ^(b)	10 May 2024
	Laboratory analysis for • Ammonia • Gas combustion temperature • Exhaust temperature • Exhaust gas velocity (a)	Quarterly	10 May 2024
	 Gas combustion temperature Exhaust temperature Exhaust gas velocity (a) 	Continuously	1 - 31 May 2024
Stack of Landfill Gas Flare	Laboratory analysis for • NO ₂ • CO • SO ₂ • Benzene • Vinyl chloride In-situ analysis for • Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	9 May 2024
	Laboratory analysis forNon-methane organic compounds CO	Quarterly for the 1 st year of operation ^(b)	9 May 2024



Monitoring Location	Parameter	Frequency	Monitoring Date
Stack of Landfill Gas Flare	 Gas combustion temperature Exhaust temperature Exhaust gas velocity (a) 	Continuously	1 – 31 May 2024
Stack of Landfill Gas Generator	Laboratory analysis for NO ₂ CO SO ₂ Benzene Vinyl chloride In-situ analysis for Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	9 May 2024
	Laboratory analysis for Non-methane organic compounds	Quarterly for the 1 st year of operation ^(b)	9 May 2024
	 Exhaust temperature Exhaust gas velocity (a) 	Continuously	1 - 31 May 2024

Notes:

- (a) The exhaust gas velocity is calculated based on the cross-section area of the stack and continuous monitored gas flow and combustion temperature data.
- (b) The monitoring results are being reviewed to determine if monitoring of this parameter can be terminated upon agreement by the EIAO Authority, IEC and Project Proponent.

2.1.3.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for thermal oxidizer, landfill gas flare and landfill gas generator stack emission monitoring during the reporting period is provided in **Annex C**.

2.1.3.3 RESULTS AND OBSERVATIONS

The thermal oxidizer, landfill gas flare and landfill gas generator stack emission monitoring results and detailed continuous monitoring results are summarised in Tables 2.12 - 2.14 and provided in Annex D7, respectively.



TABLE 2.12 SUMMARY OF THERMAL OXIDISER STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
NO ₂	1.18 gs ⁻¹	1.58 gs ⁻¹
СО	0.03 gs ⁻¹	0.53 gs ⁻¹
SO ₂	0.01 gs ⁻¹	0.07 gs ⁻¹
Benzene	<2.0 x 10 ⁻⁴ gs ⁻¹	3.01 x 10 ⁻² gs ⁻¹
Vinyl chloride	<1.3 x 10 ⁻⁴ gs ⁻¹	2.23 x 10 ⁻³ gs ⁻¹
Non-Methane Organic Carbons	<0.003 gs ⁻¹	-
Ammonia	0.0232 gs ⁻¹	_ (c)
Gas combustion temperature	900°C (894°C – 907°C)	850°C (minimum)
Exhaust gas exit temperature	1,225K (1,213K - 1,232K)	443K (minimum) (a)
Exhaust gas velocity	9.3 ms ^{-1 (b)}	7.5 ms ⁻¹ (minimum) ^(a)

Notes:

- (a) Level under full load condition.
- (b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.
- (c) The emission limit for ammonia is under review and will be supplemented in subsequent revision.

TABLE 2.13 SUMMARY OF LANDFILL GAS FLARE STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
NO_2	0.02 gs ⁻¹	0.97 gs ⁻¹
СО	0.02 gs ⁻¹	2.43 gs ⁻¹
SO ₂	0.06 gs ⁻¹	0.22 gs ⁻¹
Benzene	6.73 x 10 ⁻⁴ gs ⁻¹	4.14 x 10 ⁻⁴ gs ⁻¹
Vinyl chloride	<1.01 x 10 ⁻⁴ gs ⁻¹	2.60 x 10 ⁻⁴ gs ⁻¹
Non-Methane Organic Carbons	<0.002 gs ⁻¹	-
Gas combustion temperature	Flare 1: 867°C (826°C – 898°C) Flare 2: 896°C (856°C – 936°C)	815°C (minimum)
Exhaust gas exit temperature	Flare 1: 1,126K (1,087K - 1,159K) Flare 2: 1,152K (1,109K - 1,189K)	923 K (minimum) (a)



Parameters	Monitoring Results (Range in Bracket)	Limit Level
Exhaust gas velocity	8.9 ms ^{-1 (b)}	9.0 m s ⁻¹ (minimum) ^(a)

Notes:

- (a) Level under full load condition.
- (b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

TABLE 2.14 SUMMARY OF LANDFILL GAS GENERATOR STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
NO ₂	0.084 gs ⁻¹	1.91 gs ⁻¹
СО	0.808 gs ⁻¹	2.48 gs ⁻¹
SO ₂	<0.001 gs ⁻¹	0.528 gs ⁻¹
Benzene	5.6 x 10 ⁻⁵ gs ⁻¹	2.47 x 10 ⁻⁴ gs ⁻¹
Vinyl chloride	<1.04 x 10 ⁻⁵ gs ⁻¹	1.88 x 10 ⁻⁵ gs ⁻¹
Non-Methane Organic Carbons	0.0037 gs ⁻¹	-
Exhaust gas exit temperature	ENGA: 868K (849K - 882K) ENGB: 866K (847K - 873K)	723K (minimum) ^(a)
Exhaust gas velocity	10.0 ms ^{-1 (b)}	30.0 ms ⁻¹ (minimum) ^(a)

Notes:

- (a) Level under full load condition.
- (b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

Limit Level exceedance was recorded for landfill gas flare stack emission monitoring in the reporting period and actions in accordance with the Event and Action Plan in Annex D3 were undertaken and the investigation reports are presented in Annex D9. Based on the investigation conducted for the monitoring event with potential Limit Levels exceedance with the Contractor and the IEC, the landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 was considered Project-related upon further investigation.

The Contractor was reminded to implement all relevant mitigation measures for the construction and operation works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.



2.1.4 AMBIENT VOCS, AMMONIA AND H2S MONITORING

2.1.4.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, ambient VOCs, ammonia and H₂S monitoring was carried out at the four designated locations along the site boundary (i.e. AM1, AM2, AM3 and AM4) during the operation/restoration phase, at quarterly interval.

The Limit Levels for ambient VOCs, ammonia and H₂S monitoring is provided in **Table 2.15** below.

TABLE 2.15 LIMIT LEVELS FOR AMBIENT VOCS, AMMONIA AND H2S MONITOIRNG

Parameters	Limit Level (µg m ⁻³)
Methane	NA ^(a)
Ammonia	180
H ₂ S	42
Dichlorodifluoro-methane	NA (a)
Vinyl Chloride	26
Methanol	2,660
Ethanol	19,200
Dimethylsulphide	8
Carbon Disulphide	150
Methylene Chloride	3,530
Chloroform	99
Methyl propionate	353
Butan-2-ol	667
1.1.1-Trichloroethane	5,550
1.2-Dichloroethane	210
Benzene	33
Carbon Tetrachloride	64
Dipropyl ether	NA (a)
Heptane	2,746
Trichloroethylene	5,500
Ethyl propionate	29
Methyl butanoate	30



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Parameters	Limit Level (µg m ⁻³)
Methanethiol	10
Toluene	1,244
Ethyl butanoate	71
Propyl benzene	19
Octane	7,942
Propyl propionate	276
1.2-Dibromoethane (EDB)	39
Butyl acetate	7,240
Tetrachloroethylene	1,380
Ethyl benzene	738
Nonane	11,540
Ethanethiol	13
Decanes	3,608
Limonene	212
Butyl benzene	47
Undecane	5,562
Butanethiol	4
Terpenes	NA (a)
Xylenes	534
Dichlorobenzene	120

Note:

(a) No relevant WHO/USEPA/CARB's ambient criteria, odour thresholds and WEL available.

2.1.4.2 VOCS

Ambient air samples were drawn into the pre-cleaned and vacuum canister directly when the valve of the flow controller (with preset flow rate) was opened. After sampling, the valve will be closed manually and the canister with VOCs gas samples were transported for laboratory analysis.

2.1.4.3 METHANE

Pre-cleaned Tedlar bag was placed in the vacuum chamber. Ambient air was collected in the Tedlar bag under the vacuum condition when the pump is switched on. The Tedlar bag was filled up to 90% of total capacity to avoid leakage and bag deformation. After sampling, pump



is switched off and the valve of Tedlar bag was closed manually. The air samples were transported back to laboratory for analysis.

2.1.4.4 AMMONIA

Calibrated personal air pump was used to pump the air through a sulfuric acid-treated silica gel sorbent tube. Gaseous ammonia in air was then trapped in the sorbent tube. The tube was transported back to laboratory for analysis.

2.1.4.5 H₂S

 H_2S in air is collected in mid-get impingers by aspirating a measured volume of air through an alkaline suspension of cadmium hydroxide (as the absorbing solution). The sulphide is precipitated as cadmium sulphide to prevent air oxidation of the sulphide. Arabinogalactan is added to the cadmium hydroxide slurry prior to sampling to minimize photo-decomposition of the precipitated cadmium sulphide. The solution is transported back to laboratory for analysis.

All air samples collected for laboratory analysis were transported to ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) laboratory within 24 hours and analysed within 48 hours.

The ambient VOCs, ammonia and H₂S monitoring programme and monitoring locations are summarised in **Table 2.16** and illustrated in **Figure 2.1**, respectively.

TABLE 2.16 AMBIENT VOCS, AMMONIA AND H2S MONITOIRNG DETAILS

Monitoring Station	Location	Parameter	Frequency	Monitoring Date
AM1	SENTX Site Boundary (North)	Methane Ammonia	Quarterly	10 May 2024
AM2	SENTX Site Boundary (West, near DP3)	A suite of VOCs (a)		
АМ3	SENTX Site Boundary (West, near RC15)	• H ₂ S		
AM4	SENTX Site Boundary (West, near EPD building)			

Note:

(a) A suite of VOCs includes:

•	Trichloroethylene Vinyl chloride Methylene chloride Chloroform 1,2-dichloroethane 1,1,1-trichloroethane Carbon tetrachloride Tetrachloroethylene 1,2-dibromoethane Benzene Toluene	•	Butyl benzene Xylenes Decanes Undecane Limonene Terpenes Ethanol Butan-2-ol Dimethylsulphide Methyl propionate Ethyl propionate	•	Dichlorobenzene Methyl butanoate Dipropyl ether Methanethiol Ethanethiol Butanethiol Methanol Heptanes Octanes Nonanes
•	Carbon disulphide	•	Propyl propionate	•	Dichlorodifluoro-
•	Propyl benzene	•	Butyl acetate		methane



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Ethyl benzene

Ethyl butanoate

Methane

2.1.4.6 MONITOIRNG SCHEDULE FOR THE REPORTING MONTH

The schedule for ambient VOCs, ammonia and H2S monitoring during the reporting period is provided in Annex C.

2.1.4.7 RESULTS AND OBSERVATIONS

The ambient VOCs, ammonia and H₂S monitoring results are summarized in **Tables 2.17** and provided in **Annex D8**.

TABLE 2.17 SUMMARY OF AMBIENT VOCS, AMMONIA AND H2S MONITORING RESULTS IN THE REPORTING PERIOD

Parameters	Limit	Monitoring Results (μg m ⁻³)			
	Level (µg m ⁻³)	AM1	AM2	АМЗ	AM4
Ammonia	180	35	48	53	49
H ₂ S	42	<15	<15	<15	<15
Methane	NA ^(a)	0.00018 %(v/v)	0.0003 %(v/v)	0.00019 %(v/v)	0.00019 %(v/v)
1.1.1- Trichloroethane	5,550	<0.8	<0.8	<0.8	<0.8
1.2-Dibromoethane (EDB)	39	<1.0	<1.0	<1.0	<1.0
1.2-Dichloroethane	210	0.3	0.4	0.3	0.3
Benzene	33	<0.5	<0.5	<0.5	<0.5
Butan-2-ol	667	<0.6	<0.6	<0.6	<0.6
Butanethiol	4	<1.2	<1.2	<1.2	<1.2
Carbon Disulphide	150	0.6	1.6	<0.5	0.5
Carbon Tetrachloride	64	<0.6	<0.6	<0.6	<0.6
Chloroform	99	<0.8	<0.8	<0.8	<0.8
Decanes	3,608	<0.7	<0.7	<0.7	<0.7
Dichlorobenzene	120	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoro- methane	NA ^(a)	1.6	1.6	1.8	1.8
Dimethylsulphide	8	<0.2	<0.2	<0.2	<0.2
Dipropyl ether	NA (a)	<0.8	<0.8	<0.8	<0.8



Parameters	Limit	Monitoring Results (μg m ⁻³)			
	Level (µg m ⁻³)	AM1	AM2	АМЗ	AM4
Limonene	212	<0.4	<0.4	<0.4	<0.4
Ethanethiol	13	<0.6	<0.6	<0.6	<0.6
Ethanol	19,200	6.9	5.6	<3.8	10.7
Ethyl butanoate	71	<1.0	<1.0	<1.0	<1.0
Ethyl propionate	29	<0.8	<0.8	<0.8	<0.8
Ethyl benzene	738	<0.5	<0.5	<0.5	<0.5
Heptane	2,746	<0.8	<0.8	<0.8	<0.8
Methanethiol	10	<0.4	<0.4	<0.4	<0.4
Methanol	2,660	64.1	67.8	32.8	65.8
Methyl butanoate	30	<0.8	<0.8	<0.8	<0.8
Methyl propionate	353	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	3,530	1.2	1.3	1.3	1.3
Butyl acetate	76	<1.0	<1.0	<1.0	<1.0
Butyl benzene	47	<1.0	<1.0	<1.0	<1.0
Nonane	11,540	<0.9	<0.9	<0.9	<0.9
Propyl benzene	19	<0.8	<0.8	<0.8	<0.8
Octane	7,942	<0.9	<0.9	<0.9	<0.9
Propyl propionate	276	<1.0	<1.0	<1.0	<1.0
Terpenes	NA ^(a)	<0.8	<0.8	<0.8	<0.8
Tetrachloroethylene	1,380	<0.7	<0.7	<0.7	<0.7
Toluene	1,244	<0.5	0.8	<0.5	<0.5
Trichloroethylene	5,500	<1.1	<1.1	<1.1	<1.1
Undecane	5,562	<1.2	<1.2	<1.2	<1.2
Vinyl Chloride	26	<0.3	<0.3	<0.3	<0.3
Xylenes	534	<0.5	0.5	<0.5	<0.5

(a) No relevant WHO/USEPA/CARB's ambient criteria and WEL available.



All ambient VOCs, ammonia and H_2S monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D3**.

2.2 NOISE MONITORING

2.2.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact noise monitoring was conducted weekly at the monitoring location (i.e. NM1) to obtain one set of 30-minute measurement between 07:00 and 19:00 hours on normal weekdays.

The Action and Limit Levels for operational noise of the Project are provided in **Table 2.18** below.

TABLE 2.18 ACTION AND LIMIT LEVELS FOR OPERATIONAL NOISE

Time Period	Action Level (a)	Limit Level (b)
07:00 - 19:00 hrs on all days	When one documented complaint is received from any one of the noise sensitive receivers (NSRs)	65 dB(A) at NSRs (c)
19:00 - 23:00 hrs on all days	or	65 dB(A) at NSRs (c)
	75 dB(A) recorded at the monitoring	
23:00 - 07:00 hrs on all days	station	55 dB(A) at NSRs (c)

Notes:

- (a) 75dB(A) along and at about 100m from the SENTX site boundary was set as the Action Level.
- (b) Limits specified in the GW-TM and IND-TM for construction and operational noise, respectively.
- (c) Limit Level only apply to operational noise without road traffic and construction activities noise.

Noise monitoring was performed by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) using sound level meter at the designated monitoring station NM1 (see **Figure 2.1**) in accordance with the requirements stipulated in the updated EM&A Manual. Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Details of the deployed equipment are provided in **Table 2.19**. Copies of the calibration certificates for the equipment are presented in **Annex E1**.



TABLE 2.19 NOISE MONITORING DETAILS

Monitoring Station	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
NM1	SENTX Site Boundary (North)	L _{eq (30 min)} measurement between 07:00 and 19:00 hours on normal weekdays (Monday to Saturday)	Once per week for 30 mins during operation of the Project	2, 8, 14, 20, 27 May 2024	Sound Level Meter: Rion NL-52 (S/N: 01010406) Acoustic Calibrator: CAL200 (S/N: 16878)

2.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for noise monitoring during the reporting period is provided in **Annex C**.

2.2.3 RESULTS AND OBSERVATIONS

A total of 5 impact noise monitoring events were scheduled during the reporting period. Results for noise monitoring are summarised in **Table 2.20**. The monitoring results and the graphical presentation of the data are provided in **Annex E2**.

TABLE 2.20 SUMMARY OF OPERATION NOISE MONITORING RESULTS IN THE REPORTING PERIOD

	Measured Noise Level L _{eq (30 min)} , dB(A)		
Monitoring Station	Average	Range	Action and Limit Level
NM1	54.7	51.1 - 60.8	75

Major noise sources identified during the noise monitoring included noise from operations of the SENTX and the TKO Area 137 Fill Bank, aircrafts and insects.

No Action and Limit Levels exceedance was recorded for operation noise monitoring in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex E3**.

2.3 WATER QUALITY MONITORING

2.3.1 SURFACE WATER QUALITY MONITORING

2.3.1.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact surface water quality monitoring was carried out at the three designated surface water discharge points (i.e. DP3, DP4 and DP6) at monthly intervals during operation/ restoration phase to ensure that the SENTX will not cause adverse water quality impact.



The parameters as listed in **Table 2.22** were determined by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066).

The Limit Levels of the surface water quality impact monitoring are provided in **Table 2.21**.

TABLE 2.21 LIMIT LEVELS FOR SURFACE WATER QUALITY

Parameters	Limit Level
DP3	
Ammoniacal-nitrogen	> 0.5 mg/L
COD	> 80 mg/L
SS	> 30 mg/L
DP4 & DP6	
Ammoniacal-nitrogen	> 7.1 mg/L
COD	> 30 mg/L
SS	> 20 mg/L

Note:

The limit levels specified for other parameters in *Table 10a of the Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* shall also be followed.

The locations of the monitoring stations for the Project are shown in **Figure 2.1**. All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently recalibrated at 3 monthly intervals throughout all stages of the surface water quality monitoring programme. Calibration for a DO meter was carried out before measurement according to the instruction manual of the equipment model. Details of the equipment used in the impact surface water quality monitoring works are provided in **Table 2.22**. Copies of the calibration certificates for the equipment are presented in **Annex F1**.



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TABLE 2.22 IMPACT SURFACE WATER QUALITY MONITORING DETAILS

Monitoring Station	Location	Frequency	Monitoring Dates	Parameter		Equipment
DP3	Surface water discharge point DP3	Monthly	6 May 2024	pHElectrical conductivity (EC)	BicarbonateChlorideSodiumPotassium	Horiba U- 52G (S/N: AWE7D2V4)
DP4	Surface water discharge point DP4			• SS • COD • BOD ₅	CalciumMagnesiumNickelManganese	
DP6	Surface water discharge point DP6			 TOC Ammoniacal-nitrogen Nitrate-nitrogen Nitrite-nitrogen TKN TN Phosphate Sulphate Sulphide Carbonate Oil & Grease 	 Chromium Cadmium Copper Lead Iron Zinc Mercury Boron 	

2.3.1.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for surface water quality monitoring during the reporting period is provided in Annex C.

2.3.1.3 RESULTS AND OBSERVATIONS

One monitoring event for impact surface water quality monitoring was scheduled at all designated monitoring stations during the reporting period. However, sampling could not be carried out at DP4 on 6 May 2024 due to insufficient flow. Details of impact water quality monitoring event are provided in **Annex F2**.

Limit Level exceedances (Ammoniacal-nitrogen and SS) were recorded for surface water quality impact monitoring in the reporting period and actions in accordance with the Event and Action Plan presented in **Annex F3** were undertaken. Investigation report of the exceedances is presented in **Annex F9**.

Additional surface water monitoring at DP3 for Ammoniacal-nitrogen and at DP6 for SS were scheduled on 16 May 2024 and 30 May 2024. Sampling could not be carried out at DP3 and DP6 on 16 May 2024 due to insufficient flow. Additional surface water monitoring was conducted on 30 May 2024 to confirm findings. The details and results of additional surface water monitoring are summarized in **Table 2.23** below and presented in **Annex F2**.



TABLE 2.23 DETAILS OF ADDITIONAL SURFACE WATER QUALITY MONITORING

Date	Monitoring Location	Parameter	Result	Limit Level	Remarks
16 May 2024	DP3	Ammoniacal- nitrogen	-	0.5 mg/L	Insufficient flow
16 May 2024	DP6	SS	-	20 mg/L	Insufficient flow
30 May 2024	DP3	Ammoniacal- nitrogen	0.18 mg/L	0.5 mg/L	Below Limit Level
30 May 2024	DP6	SS	34.3 mg/L	20 mg/L	Weekly monitoring shall be continued

Based on the investigation conducted for the monitoring event with potential Limit Levels exceedances with the Contractor and the IEC, the Ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6 on 6 May 2024 were found to be Project-related. The monitoring frequency shall be increased to weekly in accordance with Table 4.5b of the updated EM&A Manual until no exceedance of Limit Level. However, the Ammoniacal-nitrogen results at DP3 of the additional monitoring event conducted on 30 May 2024 are well below the Limit Level and the weekly surface water monitoring at DP3 was therefore not triggered. Weekly surface water quality monitoring (SS) shall be continued at DP6 in the next reporting period until no exceedance of Limit Level.

The Contractor was reminded to implement all relevant mitigation measures for the construction works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.

2.3.2 LEACHATE MONITORING

2.3.2.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual, continuous monitoring of leachate level and monthly monitoring of effluent quality were carried out during the operation/restoration phase.

Reduction of effluent monitoring frequency (dry season) (from daily to monthly) was approved by EPD on 22 March 2022. Monthly effluent quality monitoring (dry season) shall be conducted from 23 March 2022. The reduction of effluent monitoring frequency (wet season) (from daily to monthly) was approved by EPD on 2 August 2022. Monthly effluent quality monitoring (wet season) shall be conducted from 3 August 2022.

Temperature, pH and volume of the effluent discharged from the leachate treatment plant were measured in-situ whereas the parameters as listed in Table 2.25 were determined by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066).

The Limit Levels of the leachate monitoring are provided in **Table 2.24**.



TABLE 2.24 LIMIT LEVELS FOR LEACHATE LEVELS AND EFFLUENT QUALITY

Parameters	Limit Level
Leachate Levels	
Leachate levels above the basal liner	1 m above the primary liner of the leachate containment system
Effluent Quality	
Temperature	> 43 °C
pH Value	6 - 10
Volume Discharged	>2,000 m³
Suspended Solids (SS)	> 800 mg/L
Phosphate	> 25 mg/L
Sulphate	> 800 mg/L
Total Inorganic Nitrogen ^(a)	> 100 mg/L
Biochemical Oxygen Demand (BOD)	> 800 mg/L
Chemical Oxygen Demand (COD)	> 2,000 mg/L
Oil & Grease	> 20 mg/L
Boron	> 7,000 µg/L
Iron	> 5 mg/L
Cadmium	> 1 µg/L
Chromium	> 300 µg/L
Copper	> 1,000 µg/L
Nickel	> 700 µg/L
Zinc	> 700 µg/L

(a) Total Inorganic Nitrogen include Ammoniacal-nitrogen, Nitrite-nitrogen and Nitrate-nitrogen.

All in situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the leachate quality monitoring programme. Details of the equipment used are provided in Table 2.25. Copies of the calibration certificates for the equipment are presented in **Annex F4**.

TABLE 2.25 LEACHATE LEVELS AND EFFLUENT QUALITY MONITORING DETAILS

Location	Frequency	Parameter	Monitoring Dates	Equipment
Leachate levels above the basal liner	Continuous	Leachate Levels	1 – 31 May 2024	Pairs of pressure transducers



Location	Frequency	Parameter	Monitoring Dates	Equipment
Effluent discharged from LTP	Daily for the first 3 months upon full operation of the LTP at wet season (Apr to Sep) and dry season (Oct to Mar), respectively and reduce to monthly thereafter subject to the monitoring results of the first 3 months for each season and agreement with the EIAO Authority, IEC and IC. (a)	On-site Measurements: Volume pH Temperature Laboratory analysis: Suspended Solids COD BOD5 TOC Ammoniacal- nitrogen Nitrate-nitrogen Nitrite-nitrogen Total Nitrogen Sulphate Phosphate Oil & Grease Alkalinity Chloride Calcium Potassium Magnesium Iron Zinc Copper Chromium Nickel Cadmium Boron	9 May 2024	Lutron PH-208 (S/N: TF31039)

(a) Reduction of monitoring frequency will be subject to the monitoring results to demonstrate environmentally acceptable performance.

2.3.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for leachate monitoring during the reporting period is provided in **Annex C**.

2.3.2.3 RESULTS AND OBSERVATIONS

The leachate levels and effluent quality monitoring results are summarised in Table 2.26 and Table 2.27, respectively. The detailed monitoring results are provided in Annex F5 and Annex F6, respectively.



TABLE 2.26 SUMMARY OF LEACHATE LEVELS IN THE REPORTING PERIOD

Monitoring Location	Average Leachate Head Levels (cm) (Range in Bracket)	Limit Level (cm)				
Pump Station No. 1X (Cell 1X)	Pump Station No. 1X (Cell 1X)					
Meter No. X-1	104 (102 - 128)	>178				
Meter No. X-2	115 (93 - 119)					
Average	109 (99 - 123)					
Pump Station No. 2X (Cell 2X)						
Meter No. X-3	106 (102 - 120)	>180				
Meter No. X-4	121 (97 - 139)					
Average	114 (103 - 130)					
Pump Station No. 3X (Cell 3X)						
Meter No. X-5	112 (99 - 119)	> 175				
Meter No. X-6	112 (99 - 119)					
Average	112 (99 - 119)					
Pump Station No. 4X (Cell 4X)						
Meter No. X-7	115 (100 - 142)	> 186				
Meter No. X-8	114 (100 - 133)					
Average	114 (100 - 138)					



TABLE 2.27 SUMMARY OF EFFLUENT QUALITY MONITORING RESULTS IN THE REPORTING PERIOD

Parameters		Monitoring Results	Limit Level
Effluent Discharged from	LTP		
Temperature	°C	34.3	> 43 °C
pH Value	pH unit	8.3	6 - 10
Volume Discharged	m³	1365	>2,000 m³
Suspended Solids (SS)	mg/L	23	> 800 mg/L
Phosphate	mg/L	5.22	> 25 mg/L
Sulphate	mg/L	224	> 800 mg/L
Total Inorganic Nitrogen (a)	mg/L	36.06	> 100 mg/L
BOD	mg/L	10	> 800 mg/L
COD	mg/L	791	> 2,000 mg/L
Oil & Grease	mg/L	<5	> 20 mg/L
Boron	μg/L	3820	> 7,000 µg/L
Iron	mg/L	1.26	> 5 mg/L
Cadmium	μg/L	<1.0	> 1 µg/L
Chromium	μg/L	85	> 300 µg/L
Copper	μg/L	<10	> 1,000 µg/L
Nickel	μg/L	85	> 700 µg/L
Zinc	μg/L	63	> 700 µg/L

(a) Total Inorganic Nitrogen include Ammoniacal-nitrogen, Nitrite-nitrogen and Nitrate-nitrogen.

All leachate levels and effluent quality monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex F3**.

2.3.3 GROUNDWATER MONITORING

2.3.3.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project with incorporation of the proposed updates under the Amendment Summary approved by EPD on 15 June 2020, groundwater monitoring was carried out at 14 perimeter groundwater monitoring wells (including 3 upgradient wells and 11 down-gradient wells) (i.e. MWX-1 to MWX-14) to monitor the



groundwater quality and level of the perimeter groundwater monitoring wells at monthly interval.

The Limit Levels for groundwater quality is provided in **Table 2.28** below.

TABLE 2.28 LIMIT LEVELS FOR GROUNDWATER QUALITY

Location	Limit Levels			
	Ammoniacal-nitrogen (mg L ⁻¹)	COD (mg L ⁻¹)		
MWX-1	5.00	30		
MWX-2	5.00	30		
MWX-3	5.00	30		
MWX-4	7.63	36		
MWX-5	5.00	30		
MWX-6	5.00	46		
MWX-7	6.55	36		
MWX-8	15.85	50		
MWX-9	7.30	71		
MWX-10	5.00	30		
MWX-11	5.00	30		
MWX-12	5.00	30		
MWX-13	5.00	30		
MWX-14	5.00	30		

A bladder pump with Teflon sampling tube and adjustable discharge rates was used for purging and taking of groundwater sample from the monitoring wells. Filtered groundwater samples were collected by connecting a disposable in-line filter system to the tubing of the sampling pump, prior to storage and analysis by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066). A portable dip meter with 5mm accuracy was used for measurement of groundwater level at each well. The dip meter has an audio indicator of the water level and was checked before use.

The measurements of pH and electrical conductivity (EC) were undertaken in situ. In situ monitoring instruments in compliance with the specifications listed under Section 4.3.2 of the updated EM&A Manual were used to undertake the groundwater quality monitoring for the Project. Details of the equipment used and the monitoring locations are summarised in Table **2.29** and illustrated in **Figure 2.1**, respectively. Copies of the calibration certificates for the equipment are presented in Annex F7.



TABLE 2.29 GROUNDWATER MONITOIRNG DETAILS

Location	Frequency	Parameter		Monitoring Dates	Equipment
All groundwater monitoring wells (MWX-1 to MWX-14)	Monthly	 Water level pH EC COD BOD5 TOC Ammoniacal-nitrogen Nitrate-nitrogen Nitrite-nitrogen TKN TN Sulphate Sulphide Carbonate Bicarbonate Phosphate 	 Chloride Sodium Potassium Calcium Magnesium Nickel Manganese Chromium Cadmium Copper Lead Iron Zinc Mercury Boron 	3, 16 May 2024	Horiba U-52G (S/N: AWE7D2V4)

2.3.3.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for groundwater quality monitoring during the reporting period is provided in Annex C.

2.3.3.3 RESULTS AND OBSERVATIONS

The groundwater quality monitoring results and detailed monitoring results are summarised in **Table 2.30** and provided in **Annex F8**, respectively.

TABLE 2.30 SUMMARY OF GROUNDWATER MONITORING RESULTS IN THE REPORTING **PERIOD**

Location	Ammoniacal-nitrogen (mg L ⁻¹)		COD (mg L ⁻¹)	
	Monitoring Results	Limit Levels	Monitoring Results	Limit Levels
MWX-1	0.29	5.00	11	30
MWX-2	1.05	5.00	21	30
MWX-3	0.05	5.00	14	30
MWX-4	0.09	7.63	15	36
MWX-5	6.59	5.00	42	30
MWX-6	3.92	5.00	47	46
MWX-7	4.66	6.55	12	36
MWX-8	14.5	15.85	49	50



MWX-9	0.02	7.30	22	71
MWX-10	0.01	5.00	10	30
MWX-11	0.03	5.00	7	30
MWX-12	0.04	5.00	3	30
MWX-13	0.03	5.00	3	30
MWX-14	N/A (a)	5.00	N/A ^(a)	30

(a) MWX-14 is not accessible due to safety considerations.

Limit Level exceedances were recorded for groundwater monitoring in the reporting period and actions in accordance with the Event and Action Plan presented in **Annex F3** were undertaken and the investigation report is presented in **Annex F9**. Based on the investigation conducted for the monitoring event with potential Limit Levels exceedance with the Contractor and the IEC, the groundwater (ammoniacal-nitrogen) exceedance at MWX-5 and the groundwater (COD) exceedances at MWX-5 and MWX-6 on 3 May 2024 were considered non Project-related upon further investigation.

The Contractor was reminded to implement all relevant mitigation measures for the construction and operation works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.

2.4 LANDFILL GAS MONITORING

2.4.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, landfill gas monitoring was carried out at the perimeter of the waste boundary (monitoring wells), area between the SENTX Site boundary and the waste boundary (surface emission), occupied on-site building, service voids, utilities pit and manholes in the vicinity of the SENTX (build-up of landfill gas) during the operation/restoration phase.

The Limit Levels for landfill gas monitoring is provided in **Table 2.31** below.

TABLE 2.31 LIMIT LEVELS FOR LANDFILL GAS CONSTITUENTS

Parameters	Monitoring Location Limit Level (% (v/v))				
Perimeter Landfill Gas Monitoring Wells ^(a)					
Methane & Carbon Dioxide		Methane	Carbon Dioxide		
	LFG1	1.0	3.2		
	LFG2	1.0	4.3		
	LFG3	1.0	6.3		
	LFG4	1.0	7.0		
	LFG5	1.0	3.4		
	LFG6	1.0	9.1		
	LFG7	1.0	1.5		



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Parameters	Monitoring Location	Limit Level (% ((v/v))
	LFG8	12.6	2.4
	LFG9	2.5	1.7
	LFG10	3.5	1.6
	LFG11	3.0	2.0
	LFG12	13.2	1.5
	LFG13	22.5	2.7
	LFG14	5.2	1.8
	LFG15	18.2	2.0
	LFG16	1.0	2.0
	LFG17	17.8	2.4
	LFG18	2.3	2.1
	LFG19	6.3	3.1
	LFG20	1.0	4.6
	LFG21	1.0	4.8
	LFG22	1.0	4.0
	LFG23	1.0	10.3
	LFG24	1.0	4.7
	GP1	1.0	10.6
	GP2 (shallow)	1.0	11.4
	GP2 (deep)	1.0	10.4
	GP3 (shallow)	1.0	6.9
	GP3 (deep)	1.0	5.6
	GP4 (shallow)	1.0	11.6
	GP4 (deep)	1.0	7.7
	GP5 (shallow)	1.0	10.8
	GP5 (deep)	1.0	7.5
	GP6	1.0	8.4
	GP7	1.0	4.5
	GP12	1.0	2.3
	GP15	1.0	2.2
	P7	1.0	2.5
	P8	1.0	1.7
	P9	1.0	2.7

Service Voids, Utilities Pits and Manholes



Parameters	Monitoring Location	Limit Level (% (v/v))			
Methane (or flammable gas)	Service voids, utilities pits and manholes	1% by volume			
Permanent Gas Mo	nitoring System				
Methane (or flammable gas)	Permanent Gas Monitoring System	1% by volume (20% LEL)			
Area Between the SENTX Site Boundary and Waste Boundary (Surface Emission)					
Flammable gas	Area between SENTX site boundary and waste boundary	30 ppm			

(a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report.

Gas analysers in compliance with the specifications listed under Section 5.4.1 of the updated EM&A Manual were used to monitor the gas parameters at the landfill gas monitoring wells, service voids, utilities pits and manholes. The gas analyser was calibrated by a laboratory accredited under HOKLAS at yearly intervals and checked before use to ensure the validity and accuracy of the results. A portable dip meter was used to monitor the water level in the monitoring wells.

Permanent gas monitoring systems with pre-set alarm levels for methane at 20% lower explosive limit (LEL, equivalent to 1% methane gas (v/v)) were installed and operated in all occupied on-site buildings at SENTX. A central control panel is equipped to alert site personnel when the gas concentration at any detector reaches the alarm level.

The equipment used in the landfill gas monitoring programme is summarised in **Table 2.32**. The landfill gas monitoring locations for perimeter landfill gas monitoring wells and service voids, utilities and manholes along the Site boundary are illustrated in Figures 2.3-2.4 and Annex G1, respectively. Copies of the calibration certificates for the equipment are presented in Annex G2.

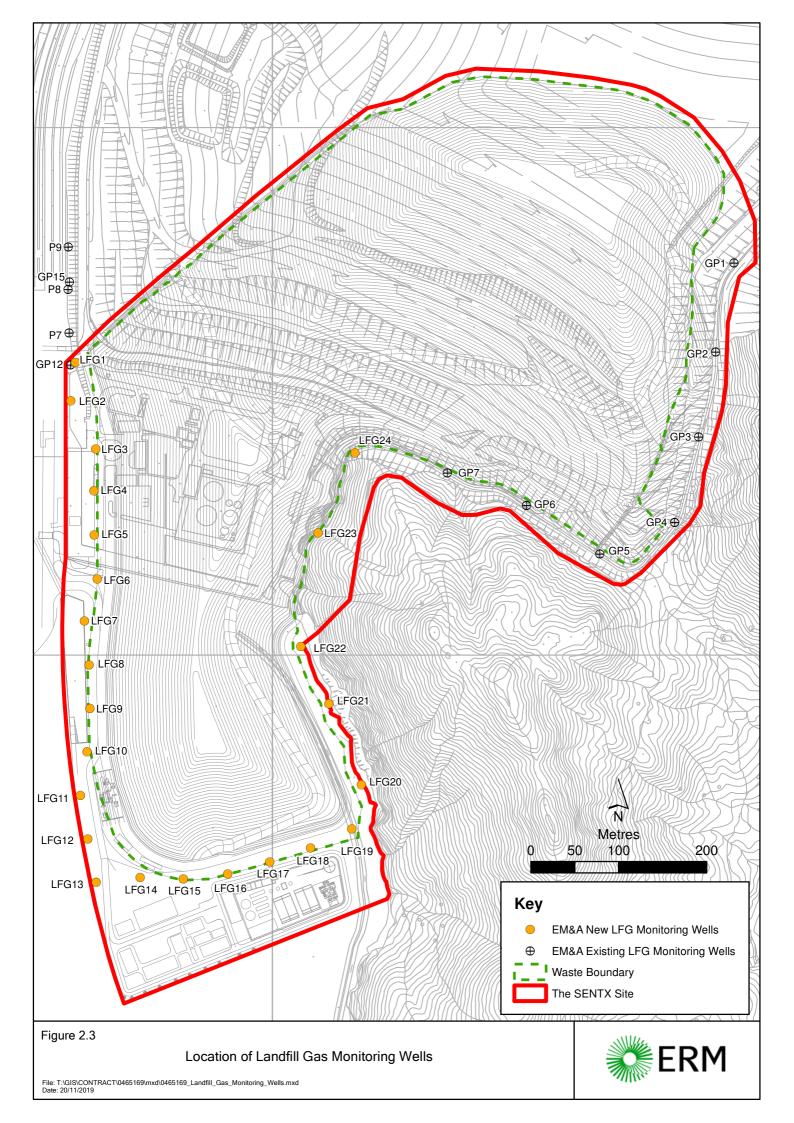
TABLE 2.32 LANDFILL GAS MONITORING DETAILS

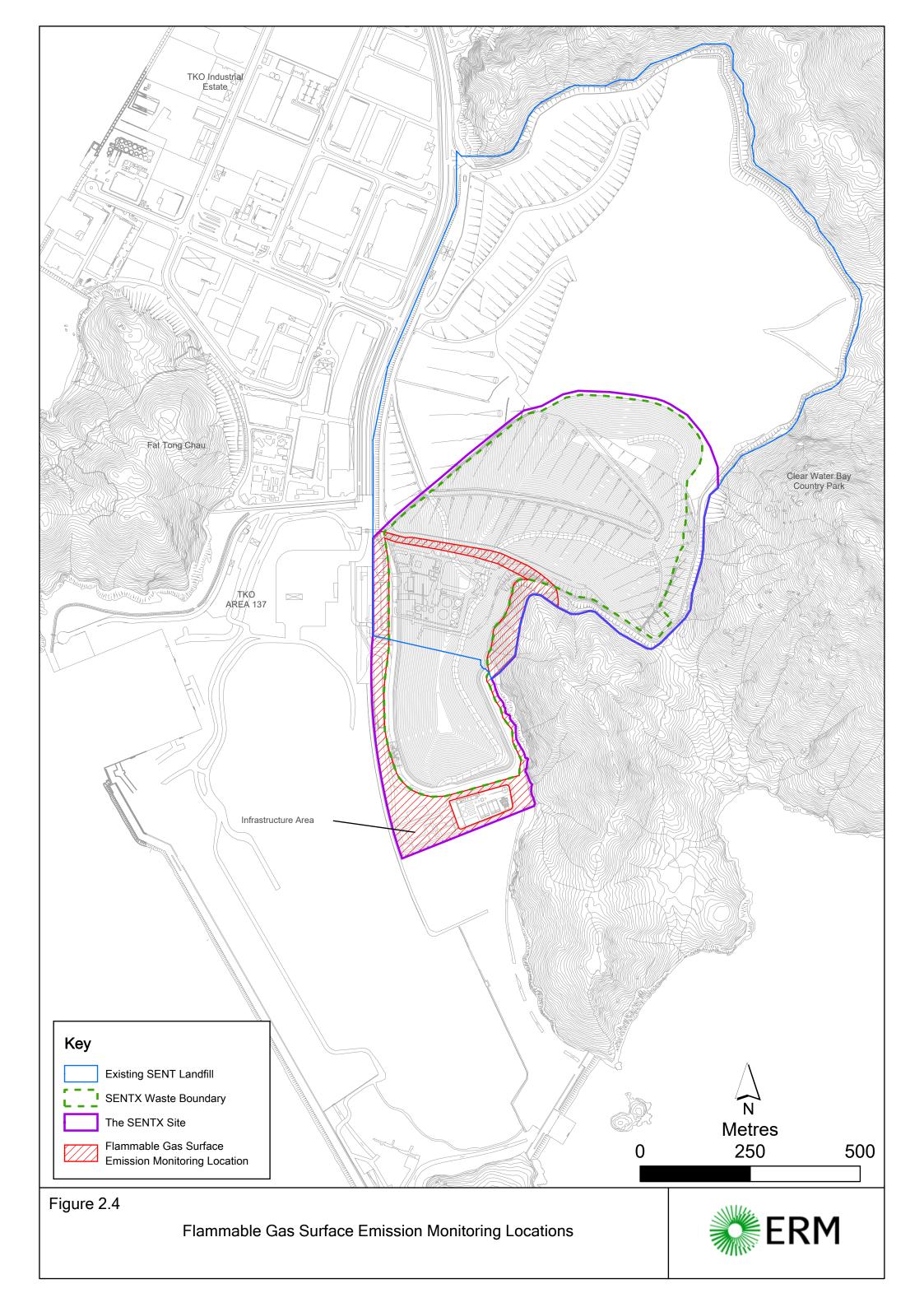
Monitoring Location	Frequency	Parameter	Monitoring Dates	Equipment
Perimeter landfill gas monitoring wells (LFG1 to LFG24, P7 to P9, GP1 to GP7, GP12 and GP15)	Monthly	MethaneCarbon dioxideOxygenAtmospheric pressure	8 May 2024	GA5000 (S/N: G508090)
Service voids, utilities and manholes along the Site boundary and within the SENTX Site (UU1 to UU28)	Monthly	MethaneCarbon dioxideOxygen	6 May 2024	GA5000 (S/N: G508090)
Permanent gas monitoring system in all occupied on-site buildings	Continuous	Methane (or flammable gas) by	1 – 31 May 2024	Permanent gas



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Monitoring Location	Frequency	Parameter	Monitoring Dates	Equipment
		permanent gas monitoring system		monitoring system
Areas between the SENTX Site boundary and the waste boundary and location of vegetation stress	Quarterly	Flammable gas emitted from the ground surface	14 May 2024	GMI Leak Surveyor (S/N: 554846)
Bulk gas sampling at least 2 of the perimeters LFG monitoring wells	Quarterly	 Methane Carbon dioxide Oxygen Nitrogen Carbon monoxide Other flammable gas 	8 May 2024	Gas sampling pump and Tedlar bags

2.4.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for landfill gas monitoring during the reporting period is provided in **Annex C**.

2.4.3 RESULTS AND OBSERVATIONS

The landfill gas monitoring results are summarised and provided in Tables 2.33 - 2.36 and Annex G3, respectively.

TABLE 2.33 SUMMARY OF LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS IN THE REPORTING PERIOD

Location	Methane (%	(v/v))	Carbon Dioxide (% (v/v))		
	Monitoring Results	Limit Levels	Monitoring Results	Limit Levels	
LFG1	0.1	1.0	0.6	3.2	
LFG2	0.1	1.0	0.7	4.3	
LFG3	0.1	1.0	3.8	6.3	
LFG4	0.1	1.0	1.7	7.0	
LFG5	0.1	1.0	0.3	3.4	
LFG6	0.1	1.0	0.4	9.1	
LFG7	0.1	1.0	0.1	1.5	
LFG8	0.1	12.6	0.1	2.4	
LFG9	0.9	2.5	0.1	1.7	
LFG10	1.3	3.5	0.2	1.6	
LFG11	0.1	3.0	0.0	2.0	
LFG12	0.3	13.2	0.0	1.5	
LFG13	0.1	22.5	0.0	2.7	



Location	Methane (% (v/v))		Carbon Diox (v/v))	ide (%
	Monitoring Results	Limit Levels	Monitoring Results	Limit Levels
LFG14	0.3	5.2	0.0	1.8
LFG15	10.8	18.2	0.1	2.0
LFG16	0.1	1.0	0.1	2.0
LFG17	10.8	17.8	0.3	2.4
LFG18	0.1	2.3	0.1	2.1
LFG19	0.1	6.3	0.1	3.1
LFG20 ^(b)	N/A	1.0	N/A	4.6
LFG21	0.0	1.0	0.1	4.8
LFG22	0.0	1.0	0.1	4.0
LFG23	0.0	1.0	0.1	10.3
LFG24	0.0	1.0	0.1	4.7
GP1	0.0	1.0	7.6	10.6
GP2 (shallow)	0.0	1.0	1.1	11.4
GP2 (deep)	0.0	1.0	0.2	10.4
GP3 (shallow)	0.0	1.0	0.1	6.9
GP3 (deep)	0.0	1.0	1.3	5.6
GP4 (shallow)	0.0	1.0	1.0	11.6
GP4 (deep)	0.0	1.0	4.2	7.7
GP5 (shallow)	0.0	1.0	5.5	10.8
GP5 (deep)	0.0	1.0	0.1	7.5
GP6	0.0	1.0	5.6	8.4
GP7	0.0	1.0	0.1	4.5
GP12	0.1	1.0	0.2	2.3
GP15	0.1	1.0	0.0	2.2
P7	0.1	1.0	0.0	2.5
P8	0.1	1.0	0.2	1.7
P9	0.1	1.0	0.4	2.7

- (a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report.
- (b) Monitoring well LFG20 was under maintenance.



TABLE 2.34 SUMMARY OF LANDFILL GAS MONITORING RESULTS AT SERVICE VOIDS, UTILITIES PITS AND MANHOLES IN THE REPORTING PERIOD

Location	Methane (% (v/v))	
	Monitoring Results	Limit Levels
UU01	0.0	1.0
UU02	0.0	1.0
UU03	0.0	1.0
UU04	0.0	1.0
UU05	0.0	1.0
UU06	0.0	1.0
UU07	0.0	1.0
UU08	0.0	1.0
UU09	0.0	1.0
UU10	0.0	1.0
UU11	0.0	1.0
UU12	Voided due to latest site programme and on-going operation work	1.0
UU13	0.0	1.0
UU14	0.0	1.0
UU15	0.0	1.0
UU16	0.0	1.0
UU17	Voided due to latest site programme and on-going operation work	1.0
UU18	Voided due to latest site programme and on-going operation work	1.0
UU19	Voided due to latest site programme and on-going operation work	1.0
UU20	0.0	1.0
UU21	0.0	1.0
UU22	0.0	1.0
UU23	0.0	1.0
UU24	0.0	1.0
UU25	0.0	1.0
UU26	0.0	1.0
UU27	0.0	1.0
UU28	0.0	1.0



TABLE 2.35 SUMMARY OF LANDFILL GAS BULK SAMPLING MONITORING RESULTS IN THE REPORTING PERIOD

Parameters	Limit Level (LFG2) ^(a)	LFG2	Limit Level (LFG8) ^(a)	LFG8
Methane (% (v/v))	1.0	<0.020	12.6	<0.020
Carbon Dioxide (% (v/v))	4.3	0.624	2.4	0.089
Oxygen (% (v/v))	-	19.5	-	20.1
Nitrogen (% (v/v))	-	78.3	-	78.2
Carbon Monoxide (% (v/v))	-	<0.020	-	<0.020
Hydrogen (% (v/v))	-	<0.020	-	<0.020
Ethane (ppmv)	-	<1.0	-	<1.0
Propane (ppmv)	-	<1.0	-	<1.0
Butane (ppmv)	-	<1.0	-	<1.0

TABLE 2.36 SUMMARY OF FLAMMABLE GAS SURFACE EMISSION MONITORING RESULTS IN THE REPORTING PERIOD

GPS Coordinates Latitude (N)	Longitude (E)	Monitoring Results (ppm)	Limit Level (ppm)
22°16′34″	114°16′38″	13	30
22°16′24″	114°16′26″	16	
22°16′31″	114°16′27″	11	

The alarm of the permanent gas monitoring systems with pre-set levels for methane at 20% lower explosive limit (LEL, equivalent to 1% methane gas (v/v)) was not triggered at all occupied on-site buildings at SENTX in May 2024.

All the landfill gas monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex G4**.

2.5 LANDSCAPE AND VISUAL MONITORING

2.5.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, the monthly landscape and visual audit was conducted on 20 May 2024 to monitor the implementation of the landscape and visual mitigation measures during operation/ restoration phase.

All relevant environmental mitigation measures listed in the approved EIA Report and the updated EM&A Manual and their implementation status are summarized in **Annex B**.



⁽a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report.

2.5.2 RESULTS AND OBSERVATIONS

The Contractor has implemented environmental mitigation measures as stated in the approved EIA Report and the EM&A Manual.

Regarding the landscape and visual audit, the Contractor was reminded to maintain the advance screen planting works regularly to ensure effective screening of views of project works from the High Junk Peak Trail.

2.6 **EM&A SITE INSPECTION**

Site inspections were carried out on a weekly basis with the Contractor, IEC and EPD to monitor the implementation of proper environmental pollution control and mitigation measures under the Project. In the reporting period, 5 site inspections were carried out on 2, 9, 16, 23 and 30 May 2024.

Key observations during the site inspections are summarised in **Table 2.37**.

TABLE 2.37 KEY OBSERVATIONS IDENTIFIED DURING THE SITE INSPECTION IN THIS REPORTING MONTH

Inspection Date	Environmental Observations and Recommendations
2 May 2024	 The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times. The Contractor shall adjust the pH of Wetsep 2 at DP4 to ensure all surface water is treated within pH 6-9 before discharge.
9 May 2024	• The Contractor shall repair the silt fencing at X10 channel near Pump House No.3 to minimize SS runoff to the channel.
16 May 2024	The Contractor shall remove the general refuse accumulated at DP3 to prevent general refuse drops into sediment trap.
23 May 2024	 The Contractor shall review Wetsep treatment efficiency at DP3 to prevent non-compliance with the WPCO standard and EM&A requirement. The Contractor shall repair the silt fencing at X10 channel near Pump House No.3 to minimize SS runoff to the channel. The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times. The Contractor shall remove the stagnant water and chemicals in the drip trays of Wetseps near DP4 and handle the clean-up materials as chemical waste.
30 May 2024	The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times.

The Contractor has rectified all the observations identified during environmental site inspections in the reporting period. Key environmental deficiencies identified and the corresponding rectification actions are presented in Table 2.38.



TABLE 2.38 SUMMARY OF ENVIRONMENTAL DEFICIENCIES IDENTIFIED AND CORRESPONDING RECTIFICATION ACTIONS

Deficiencies	Rectifications Implemented	Proposed Additional Control Measures
Surface Water		
Intercepting channels & drainage system	Reviewed drainage plan.	 Addition of channels. Expedite the construction of permanent sediment trap and discharge culverts.
DP channels (design & regular silt removal)	 Carried out regular maintenance and cleaning of channels. DP4 channel: Area near the channel was paved with concrete and a bund was built. DP6 channel: Gravel piles on the channel were covered with concrete which serve as blocks for running water and to divide the channel into several sections. A pump was placed in the water zone in the upstream section to pump water to the Wetsep for treatment prior to the discharge to the last section before the weir plate. DP6: Pipes through the gravel piles between different channel sections were covered with geotextiles to block debris and silt. 	N.A.
Stockpiles & exposed soil	Installed silt fencing near surface water channel along DP6 channel.	 Improve soil covering. Compaction and cover for stockpiles and soil slopes.
Wetsep (treatment capacity & number)	 Reviewed Wetsep capacity. Chemicals dosage of the Wetsep was increased to enhance the efficiency. 	Install additional Wetsep.
Backflow / ponding during heavy rainfall	Raised with EPD (LDG) and CEDD.	N.A.



2.7 WASTE MANAGEMENT STATUS

The Contractor has registered as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

As informed by the Contractor, waste generated during this reporting period include mainly chemical waste. Reference has been made to the waste flow table prepared by the Contractor. The quantities of different types of wastes and imported fill materials are summarized in **Table 2.39**.

TABLE 2.39 QUANTITIES OF DIFFERENT WASTE GENERATED AND IMPORTED FILL MATERIALS

Month /Year	Inert C&D Materials (a) (in '000m ³)	Imported Fill (in '000kg)	Inert Construction Waste Re- used (in '000m³)		Materials (d) (in	Yard Was '000kg)	ste (in	Chemical Wastes (in '000kg)
	ooom*)		(iii oooiii)			Y Park	SENT	
1 - 31 May 24	0	0	0	0	0	0	0	0.80

Notes:

- (a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill. Density assumption: 1.6 (kg/L) for public fill.
- (b) Imported fill refers to materials generated from other project for on-site reuse.
- (c) Non-inert construction wastes include general refuse disposed at landfill. Density assumption: 0.9 (kg/L) for general refuse.
- (d) Recyclable materials include metals, paper, cardboard, plastics and others.

2.8 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

A summary of the Environmental Mitigation Implementation Schedule is presented in **Annex B.** The necessary mitigation measures were implemented properly for the Project.

2.9 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

The operation/ restoration phase noise and landfill gas monitoring results complied with the Action and Limit Levels in the reporting period.

One exceedance of Limit Levels for landfill gas flare stack emission (Benzene) was recorded for air quality monitoring in the reporting period. The landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 was considered Project-related upon further investigation.

Two exceedances of the Limit Levels for surface water (Ammoniacal-nitrogen and SS), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and two exceedances of the Limit Levels for groundwater (COD) were recorded for water quality monitoring in the reporting period. The surface water (Ammoniacal-nitrogen) exceedance at DP3 and the surface water (SS) exceedance at DP6 on 6 May 2024 were considered Project-related upon further investigation. The groundwater (ammoniacal-nitrogen) exceedance at MWX-5 and the



groundwater (COD) exceedances at MWX-5 and MWX-6 on 3 May 2024 were considered non Project-related upon further investigation.

Cumulative statistics on exceedances is provided in **Annex H**.

2.10 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

There were no complaints, notification of summons or prosecution recorded in the reporting period.

Statistics on complaints, notifications of summons, successful prosecutions are summarised in Annex H.



3. FUTURE KEY ISSUES

3.1 CONSTRUCTION PROGRAMME FOR THE COMING MONTH

As informed by the Contractor, the major works for the Project in June 2024 will be:

- Maintenance and improvement of temporary surface water drainage; and
- Restoration of Phase 1 Cell 1X, 2X and Phase 2 Cell 3X west slopes.

3.2 KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting period of June 2024 are mainly associated with potential surface water impact in the rainy season.

3.3 MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedule for environmental monitoring in June 2024 is provided in **Annex I**.



CONCLUSION AND RECOMMENDATION 4.

This EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 May 2024 in accordance with the updated EM&A Manual and the requirements of the Environmental Permit (EP-308/2008/C).

Air quality (24-hour TSP, odour, thermal oxidiser, landfill gas flare and landfill gas generator stack emission), noise, water quality (surface water, leachate and groundwater) and landfill gas monitoring were carried out in the reporting period. Results for air quality (TSP, Odour, thermal oxidizer and landfill gas generator stack emission), noise, water quality (leachate) and landfill gas monitoring complied with the Action and Limit Levels in the reporting period.

One exceedance of Limit Levels for landfill gas flare stack emission (Benzene), two exceedances of the Limit Levels for surface water (Ammoniacal-nitrogen and SS), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and two exceedances of the Limit Levels for groundwater (COD) were recorded in the reporting period.

Environmental site inspections were carried out during the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site inspections.

There were no complaints, notification of summons or prosecution recorded in the reporting period.

The ET will keep track on the construction and operation/restoration works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.



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ANNEX A WORK PROGRAMME

		20	023		20)24		
Task Name	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1 Restoration								
Subgrade soil + Liner		_						
Cover Soil								
Above Cap Gas pipe + Drainage				1				
Landscape								
Phase 2 Restoration								
Subgrade soil + Liner								
Cover Soil								
Above Cap Gas pipe + Drainage								
Landscape								l



ANNEX B

ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

ANNEX B ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks	
Air Ouglity	Constru	ction Dhaco				D C	C O/R	A		
Air Quality – 4.8.1	AQ1	 Blasting The area within 30m of the blasting area will be wetted prior to blasting. Blasting will not be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted, unless this is with the express prior permission of the Commissioner of Mines. loose material and stones in the Site will be removed prior to the blast operation During blasting, blast nets, screens and other protective covers will be used to prevent the projection of flying 	To minimise potential dust nuisance	Blasting area and 30m of blasting area	SENTX Contractor				Air Pollution Control (Construction Dust) Regulations	Not applicable. Blasting is not required in the latest landfill design

 $^{(1) \ \ \,} D=Design; \ \ C=Construction; \ \, O/R=Operation/Restoration; \ \, A=Aftercare$



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	When to implement the measure? (1)		implement the measure? (1)		implem measur		mplement the		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α							
		fragments and material resulting from blasting														
4.8.1	AQ2	Rock Drilling Watering will be carried out at the rock drilling activities to avoid fugitive dust emissions.	To minimise potential dust nuisance	Rock drilling area	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations	Not applicable. Rock drilling is not required in the latest landfill design					
4.8.1	AQ3	 Site Access Road The main haul road will be kept clear of dusty materials or sprayed with water. The main haul road will be paved with aggregate or gravel. Vehicle speed will be 	To minimise potential dust nuisance	Main haul road	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex	Implemented					
4.8.1	AQ4	limited to 10kph. Stockpiling of Dusty Materials Any stockpile of dusty materials will be covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides or sprayed	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations	Implemented					



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	implement the measure? (1)		implement the measure? (1) or standards for the measure to achieve?		requirements or standards for the measure to	Implementation Status and Remarks
						D	С	O/R	Α	HKAQO and		
		with water so as to ensure that the entire surface is wet.								EIAO-TM Annex 4		
4.8.1	AQ5	Loading, unloading or transfer of dusty materials • All dusty materials will be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex	Implemented	
4.8.1	AQ6	• Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of height not less than 2.4m from ground level will be provided along the entire length of that portion of the site boundary except for the site entrance or exit.	To minimise potential dust nuisance	Site boundary and entrance	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex 4	Not applicable	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	When to implement the measure? (1)		implement (measure? (a)			implement the measure? (4)			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
4.8.1	AQ7	Excavation Works • Working area of any excavation or earth moving operation will be sprayed with water immediately before, during and immediately after the operation so as to ensure that the entire surface is wet.	To minimise potential dust nuisance	All construction works area	SENTX Contractor	D	C	O/R	A	Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex	Implemented					
4.8.1	AQ8	 Building Demolition The area where the demolition works are planned to take place will be sprayed with water immediately prior to, during and immediately after the demolition activities. Any dusty materials remaining after a stockpile is removed will be wetted with water and cleared from the surface of roads or street. 	To minimise potential dust nuisance	All construction works area	SENTX Contractor		V			Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex 4	Implemented					



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im _l	implement the measure? (1) D C O/R A			measure? (1)			implement the measure? (1)			c O/R A			implement the measure? (1) D C O/R A			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
4.8.1	AQ9	Construction of the Superstructure of Building • Effective dust screens, sheeting or netting will be provided to enclose the scaffolding from the ground level up to the highest level of the scaffolding.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			Air Pollution Control (Construction Dust) Regulations HKAQO and EIAO-TM Annex	Implemented												
4.8.1	AQ10	Should a stone crushing plant be needed on site, the control measures recommended in the Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1 should be implemented.	To minimise potential dust nuisance	Stone crushing plant/ construction phase	SENTX Contractor		✓			Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1	required in the												
4.8.1	AQ11	Good site practices such as regular maintenance and checking of the diesel powered mechanical equipment will be adopted to avoid any black smoke emissions and to minimize	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			HKAQO and EIAO-TM Annex 4	Implemented												



EIA Ref.	EM&A Ref	Measures/ Mitigation the Measures Re	Measures/ Mitigation the the Me		Location of the Measures	Who to implement the measure?	im	ple	to ment ure? @		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α			
		gaseous emissions.										
4.10.1	AQ12	Dust monitoring once every 6 days	Ensure the dust generated from the project meets the air quality requirement	At monitoring locations shown in Figure 3.2a	SENTX Contractor		✓			HKAQO and EIAO-TM Annex 4	Implemented	
Air Quality -	Operation	on, Restoration and Afterca	re Phases									
4.8.2	AQ13	OdourEnclosing the weighbridge area	To minimise odour nuisance	Weighbridge area	SENTX Contractor	✓		√		EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, enclosing the weighbridge area is not necessary	
4.8.2	AQ14	Providing a vehicle washing facility before the exit of SENTX and providing sufficient signage to remind RCV drivers to pass through the facility before leaving SENTX	To minimise odour nuisance	Vehicle washing facility	SENTX Contractor	✓		✓		EIAO-TM Annex 4	Implemented	
4.8.2	AQ15	Reminding the RCV drivers to empty the liquor collection sump and close the valve before leaving	To minimise odour nuisance	Tipping face	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only, which	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	implement the measure?		measure? (1)		implement the measure? (1)			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		the tipping face				D	С	O/R	Α		ia malativaly de-		
		the tipping face									is relatively dry, the amount of liquor generated is expected to minimal		
4.8.2	AQ16	Washing down the area where spillage of RCV liquor is discovered promptly	To minimise odour nuisance	SENTX Site	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only, which is relatively dry, the amount of liquor generated is expected to minimal.		
4.8.2	AQ17	Reminding operators to properly maintain their RCVs and ensure that liquor does not leak from the vehicles	To minimise odour nuisance	SENTX Site	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only, which is relatively dry, the amount of liquor generated is expected to minimal.		
4.8.2	AQ18	Installation of landfill gas control system to enhance collection of landfill gas from the waste mass and hence minimise odour associated with fugitive landfill gas emissions	To minimise odour nuisance	SENTX Site	SENTX Contractor	✓		√	✓	EIAO-TM Annex 4	Implemented		



	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	me	ple	ment : ure? @		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
							С	O/R	Α		
4.8.2	AQ19	Progressive 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 landfill gas extraction system	To minimise odour nuisance	SENTX Site	SENTX Contractor	✓		~	•	4	Implemented
4.8.2	AQ20	Installing deodorizers along the site boundary adjacent to the ASRs	To minimise odour nuisance	SENTX Site boundary	SENTX Contractor			✓	✓	EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, installation of deodorizers is not necessary.
4.8.2	AQ21	Erecting a vertical barrier, wall or structure softened by planting rows of trees/shrubs or landscape feature along the site boundary, particularly in the areas near the ASRs	To minimise odour nuisance	SENTX Site boundary	SENTX Contractor	~		✓	✓	EIAO-TM Annex 4	Implemented
4.8.2 and SENTX latest design	AQ22	Maintaining the size of the active tipping face not greater than 1,200 m²	To minimise odour nuisance	Active tipping face	SENTX Contractor			✓		EIAO-TM Annex 4	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	implement the measure? (1)		implement the measure? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
4.8.2	AQ23	Promptly covering the	To minimise	Active tipping	SENTX	D	С	O/R ✓	Α	EIAO-TM Annex	Not Applicable.	
110.2	71923	MSW with soil or selected inert materials to control odour emissions	odour nuisance	face	Contractor					4	SENTX will not receive MSW.	
4.8.2	AQ24	 Maintaining the size of the special waste trench not greater than 6m (I) × 2.5m (w) 	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. SENTX will not have any special waste trench.	
4.8.2 and SENTX latest design	AQ25	Covering daily covered area with a tarpaulin sheet or 300mm of soil after the landfill operating hours	To minimise odour nuisance	Daily covered area	SENTX Contractor			√		EIAO-TM Annex 4	Implemented	
4.8.2	AQ26	Covering special waste trench with 600 mm of soil and an impervious liner after 5 pm	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. SENTX will not have any special waste trench.	
4.8.2	AQ27	Covering the non-active tipping face with 600mm of soil and an impermeable liner (on top of the intermediate cover), which will not only control odour emissions from landfilled waste but also enhance landfill gas extraction by the landfill gas extraction system	To minimise odour nuisance	Intermediate cover	SENTX Contractor			V		EIAO-TM Annex 4	Implemented	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)			What requirements or standards for the measure to achieve?	Implementation Status and Remarks	
4.8.2	AQ28	Applying deodorizers or odour suppression agents to control odour emissions from the active tipping face and special waste trench, if any, through spraying or fogging equipment	To minimise odour nuisance	Active tipping face and special waste trench	SENTX Contractor	D	C	O/R ✓	A	EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, installation of deodorizers is not necessary. Moreover, SENTX will not have any special waste trench.
4.8.2	AQ29	Providing a mobile cover with retractable or suitable opening to cover up the opening of the special waste trench except during waste deposition and a suitable odour removal unit. The mobile cover should be equipped with powered extraction and suitable odour removal unit for purifying the trapped gas inside the trench before release into the atmosphere	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		EIAO-TM Annex 4	Not Applicable. SENTX will not have any special waste trench.



EIA Ref.	EM&A Ref	Measures/ Mitigation Measures • Providing a thermal oxidizer for the leachate treatment plant	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment ure? º)	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
4.8.2 and SENTX latest design	TX latest		To minimise odour nuisance as a result of breakdown of thermal oxidizer	plant	SENTX Contractor	✓		~	\	EIAO-TM Annex 4	Implemented
4.8.2 and SENTX latest design	AQ31	Enclosing all the leachate storage and treatment tanks (except for the Sequential Batch Reactor (SBR) or Membrane Bioreactor (MBR) tanks) and diverting the exhaust air from these tanks to a thermal oxidizer or flare to avoid potential odour emissions from the LTP	To minimise odour nuisance	Leachate treatment plant	SENTX Contractor	✓		✓	✓	EIAO-TM Annex 4	Implemented
4.8.2	AQ32	Rescheduling of waste filling activities on-site by avoiding waste filling activities carrying out at the northern area of the site in the summer months between July to November	To minimise odour nuisance	SENTX Site	SENTX Contractor			~		EIAO-TM Annex 4	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, rescheduling of waste filling activities is not necessary.
4.8.2 and SENTX latest design	AQ33	Dust, Gaseous Emission and LFG including Volatile Organic Compounds (VOCs)	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		HKAQO and EIAO-TM Annex 4	Implemented



_	EM&A Ref	Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment ure? ¤)	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		road to the waste filling area wet by regular watering;		t SENTY Site							
4.8.2	AQ34	Compacting the exposed daily and intermediate covered areas well to avoid fugitive dust emission;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		HKAQO and EIAO-TM Annex 4	Implemented
4.8.2	AQ35	Limiting the vehicle speed within SENTX site boundary;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		HKAQO and EIAO-TM Annex 4	Implemented
4.8.2	AQ36	Providing vehicle washing bay to avoid vehicles carrying dust to public roads;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		HKAQO and EIAO-TM Annex 4	Implemented
4.8.2	AQ37	Switching off the engine when the diesel-driven equipment is idling;	To minimise gaseous emissions	SENTX Site	SENTX Contractor			✓	✓	-	Implemented
4.8.2	AQ38	Maintaining the construction equipment properly to avoid any black smoke emissions;	To minimise gaseous emissions	SENTX Site	SENTX Contractor			✓	√	-	Implemented
4.8.2	AQ39	Providing sufficient underground landfill gas collection system to capture the landfill gas	To minimise gaseous emissions,	SENTX Site	SENTX Contractor			✓	√	EIAO-TM Annex 4	Implemented



EIA Ref. EM&A Ref	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment (What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		generated as much as	including LFG			D	С	O/R	Α		
4.8.2	AQ40	 Periodic inspections of the final cover should be undertaken to ensure that the capping layer is in good conditions at all times. 	gaseous	SENTX Site	SENTX Contractor			✓	√	EIAO-TM Annex 4	Implemented
4.10.2	AQ41	Monitoring of ambient TSP once every 6 days	Ensure the dust emission from the project meets the dust requirement	At monitoring locations shown in Figure 11.3a	SENTX Contractor		√	✓		HKAQO and EIAO-TM Annex 4	Implemented
4.10.2	AQ42	Monitoring of ambient VOCs, ammonia and H ₂ S, quarterly	Ensure the gaseous emission from the project meets the air quality requirement	At monitoring locations shown in Figure 11.3a	SENTX Contractor			V	V	Odour thresholds or 1% of Occupational Exposure Limit (OEL) as stipulated in the "UK Health and Safety Executive (HSE) EH 40/05 Occupational Exposure Limits", whichever is lower.	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	easu	ment t ure? ⁽¹⁾		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
4.10.2 and SENTX latest design	AQ43	Monitoring of parameters for thermal oxidizer, flares and generator in accordance with requirements stated in Tables 3.4a, 3.5a and 3.6a of the EM&A Manual respectively.	Ensure the gaseous emission from the project meets the air quality requirement	At the flares and thermal oxidizer stacks when they are in operation	SENTX Contractor	D	С	O/R	A ✓ (2)	Emission Limits specified in Contract	Implemented
4.10.2	AQ44	To confirm design assumption of ammonia, it is recommended that the ammonia concentration in the flue gas of the thermal oxidiser be monitored during the commissioning stage of the thermal oxidiser. If required, an emission standard will be set for ammonia for the thermal oxidiser based on the monitoring results. If no ammonia is detected in the flue gas during the decommissioning stage, the monitoring of ammonia in the flue gas	Ensure the gaseous emission from the project meets the air quality requirement	At the thermal oxidizer stack during commissioning . If ammonia is detected during commissioning stage, the monitoring will continue.	SENTX Contractor					Emission Limits determined during commissioning stage	Implemented

⁽²⁾ For LFG flare and LFG generator only.



	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	the Recommended the Measures im		the measure? (1)					What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		of the thermal oxidiser				D	С	O/R	Α		
		could be discontinued.									
SENTX latest lesign	AQ45	accordance with requirements stated in Table 3.7a of the EM&A Manual. Monitoring of	Ensure the odour emission from the project meets the odour requirement	Along SENTX Site boundary	SENTX Contractor			✓		EIAO-TM Annex 4	Implemented
4.10.2	AQ46	Monitoring of meteorological station, continuously Collect sit specific meteorological data	meteorological	At meteorological station shown in <i>Figure</i> 11.3a	SENTX Contractor		✓	✓	✓	-	Implemented
Noise – Cons	truction	Phase									
5.7.1	N1	Adopt good site practice listed below: • Only well-maintained plant will be operated onsite and plant should be serviced regularly during the construction program;	To minimise potential construction noise nuisance.	All construction works area	SENTX Contractor		✓			Noise Control Ordinance (NCO) and EIAO-TM Annex 5	Implemented
	Silencers or mufflers on construction equipment should be utilized and will be properly maintained during the construction program;										
		Mobile plant, if any, will be sited as far from NSRs as									



EIA Ref. EM8 Ref	EM&A Ref	Measures/ Mitigation Measures	Measures Recommended the		implement	me	plei easi	ment : ire? @		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		possible;				D	C	O/K	A		
		Machines and plant (such as trucks) that may be in intermittent use will be shut down between work periods or should be throttled down to a minimum;									
		Plant known to emit noise strongly in one direction will, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and									
		Material stockpiles and other structures will be effectively utilised, wherever practicable, in screening noise from onsite construction activities.									
5.8	N2	Weekly noise monitoring	Ensure noise generated from the project meets the criteria	At monitoring locations shown in Figure 6.4a	SENTX Contractor		✓			Noise Control Ordinance (NCO) and EIAO-TM Annex 5	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	meas	n to ement the sure? (1)	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
Noise - Ope	eration/Re	estoration Phase							'
5.7.2	N3	Adopt good site practice listed below: • Choose quieter PME;	To minimise potential operational noise nuisance.	Within the SENTX Site	SENTX Contractor		V	Noise Control Ordinance (NCO) and EIAO-TM Annex 5	Implemented
		Include noise levels specification when ordering new plant items;						-	Implemented
		 Locate fixed plant items or noise emission points away from the NSRs as far as practicable; 						-	Implemented
		 Locate noisy machines in completely enclosed plant rooms or buildings; and 						-	Implemented
		Develop and implement a regularly scheduled plant maintenance programme so that plant items are properly operated and serviced. The programme should be implemented by properly trained personnel.						-	Implemented
5.8	N4	Weekly noise monitoring	Ensure noise generated from the project	At monitoring locations	SENTX Contractor		√	Noise Control Ordinance (NCO) and	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	ple eas	n to ement ure? a	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
			meets the criteria	shown in Figure 6.4a				O/IC	EIAO-TM Annex 5	
Water Qual	ity – Cons	truction Phase	1		1				1	
6.8.1	WQ1	 Construction Runoff Exposed soil areas will be minimised to reduce the contamination of runoff and erosion. 	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor		✓		ProPECC PN 1/94 EIAO-TM Annex 6	Implemented
6.8.1	WQ2	Perimeter channels will be constructed in advance of site formation works and earthworks and intercepting channels will be provided for example along the edge of excavation.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor	√	✓		ProPECC PN 1/94 Water Pollution Control Ordinance (WPCO) EIAO-TM Annex 6	Implemented
6.8.1	WQ3	Silt removal facilities, channels and manholes will be maintained and the deposited silt and grit should be removed regularly to ensure they are functioning properly at all times.	arising from the construction works	All construction works area	SENTX Contractor		✓		ProPECC PN 1/94 WPCO EIAO-TM Annex 6	Deficiency of mitigation measures but rectified by the Contractor
6.8.1	WQ4	Temporary covers such as tarpaulin will also be provided to minimise the	To minimise potential water quality impacts arising from the	All construction works area	SENTX Contractor		✓		ProPECC PN 1/94 WPCO	Implemented



EIA Ref.	EM&A Ref	Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	the Measures	Who to implement the measure?	im	ple	n to ement ure? a		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		runoff.	construction works								
6.8.1	WQ5	The surface runoff contained any oil and grease will pass through the oil interceptors.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor		✓			ProPECC PN 1/94 WPCO EIAO-TM Annex 6	Implemented
6.8.1	WQ6	All sewer and drains will be sealed to prevent building debris, soil etc from entering public sewers/drains before commencing any demolition works	To minimise potential water quality impacts arising from the demolition works	Infrastructure area at existing SENT Landfill	SENTX Contractor		✓			ProPECC PN 1/94 WPCO EIAO-TM Annex 6	Not applicable
6.8.1	WQ7	During the excavation works for the twin drainage tunnels, the recycle water for cooling the cutter head of the TBM will be conveyed to the sedimentation tanks for treatment and most of the treated water will be reused, where applicable and as much as possible, in the boring operations.	To minimise potential water quality impacts arising from the tunnel works	Tunnel boring sites	SENTX Contractor		•			ProPECC PN 1/94 WPCO EIAO-TM Annex 6	Not applicable. Excavation of drainage tunnels is not required in the latest landfill design.
6.8.1	WQ8	The fuel and waste lubricant oil from the on-	To minimise potential water	SENTX Site	SENTX Contractor		✓			ProPECC PN 1/94	Implemented



EIA Ref. EM&A Ref	EM&A Ref	Measures/ Mitigation to Measures I	n Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im		to ment ure? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
6.8.1 WC		site maintenance of machinery and equipmen will be collected by a licensed chemical waste collector.	quality impacts arising from improper handling of fuel and oil							WPCO Waste Disposal Ordinance (WDO)	
6.8.1	WQ9	Implementation of excavation schedules, lining and covering of excavated stockpiles	To minimise contaminated stormwater run-off from the SENTX Site	All construction works	SENTX Contractor		√			ProPECC PN 1/94 WPCO EIAO-TM Annex 6	Implemented
6.13	WQ10	Monitoring of surface water quality will be conducted on a regular basis as stated in the EM&A Manual.	To minimise potential water quality impacts on surface water arising from the construction works	SENTX Site	SENTX Contractor		√			WPCO Water-TM	Implemented
6.8.2	WQ11	 Sewage Effluents Sufficient chemical toilets will be provided for the construction workforce. 	To minimise potential water quality impacts arising from the sewage effluents	SENTX Site	SENTX Contractor		✓			WPCO	Implemented
6.8.2	WQ12	Untreated sewage will not be allowed to discharge into the surrounding water body.	potential water	SENTX Site	SENTX Contractor		√			WPCO WDO	Implemented
6.8.2	WQ13	A licensed waste collector	To minimise potential water	SENTX Site	SENTX Contractor		✓			WPCO	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	to ment : ure? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		the chemical toilets on a regular basis.	quality impacts arising from the sewage effluents							WDO	
Water Quali	ty – Oper	ation/Restoration and Afte	rcare Phases								
6.9.1	WQ14	 Surface Water Management Inspections of the drainage system, sand traps, settlement ponds and surface water channels will be performed regularly to identify areas necessary for maintenance, cleaning or repair. 	To minimise potential water quality impacts on surface water arising from the landfill operations.	SENTX Site	SENTX Contractor			•		WPCO Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Inshore Waters (Water- TM) EIAO-TM Annex	Deficiency of mitigation measures but rectified by the Contractor
6.9.1	WQ15	 Regular maintenance and replacement, if required, of the HDPE liner will be conducted to prevent degradation from affecting the performance of the capping system. 	To minimise potential water quality impacts on surface water arising from the landfill operations.	SENTX Site	SENTX Contractor			✓		WPCO Water-TM EIAO-TM Annex 6	Implemented
6.9.1	WQ16	Monitoring of surface water quality will be conducted on a regular	To minimise potential water quality impacts on surface water	SENTX Site	SENTX Contractor			✓	✓	WPCO Water-TM	Implemented



	EM&A Ref	Measures/ Mitigation Measures			Who to implement the measure?	im	-	to ment ure? ¤		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		basis as stated in the EM&A Manual.	arising from the landfill operations.								
6.9.2 and SENTX latest design	WQ17	 Groundwater Management The groundwater management facilities including the groundwater monitoring wells will be inspected regularly during routine groundwater monitoring programme. 	To minimise potential water quality impacts on groundwater arising from the landfill operations.	SENTX Site	SENTX Contractor			•	✓	WPCO Water-TM EIAO-TM Annex 6	Implemented
6.9.2	WQ18	Monitoring of groundwater water quality will be conducted on a regular basis as stated in the EM&A Manual.	To minimise potential water quality impacts on groundwater arising from the landfill operations.	SENTX Site	SENTX Contractor			✓	V	WPCO Water-TM EIAO-TM Annex 6	Implemented
SENTX latest design	WQ19	 Sewage All sewage from the operation staff will be diverted to the LTP for treatment or public sewer, if available. 	To ensure proper handling of sewage	SENTX Site	SENTX Contractor			V	√	-	Implemented
6.9.3	WQ20	The leachate pump houses and related ancillary	To minimise potential water quality impacts on surrounding	Leachate pump houses and related	SENTX Contractor			✓	√	WPCO Water-TM EIAO-TM Annex 6	Implemented



	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?		ple			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		equipment will be inspected regularly and repairs, if necessary.	water bodies arising from the landfill operations.	ancillary equipment							
6.9.3	WQ21	For equipment such as pumps that require routine scheduled maintenance, the maintenance will be performed following manufacturer's recommended frequency.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate pumps	SENTX Contractor			✓	✓	WPCO Water-TM	Implemented
6.9.3	WQ22	Preventive maintenance will be implemented so that the possibility for forced shutdown during wet season will be kept to minimal.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			✓	√	WPCO Water-TM EIAO-TM Annex 6	Implemented
6.9.3	WQ23	Emergency procedures or a contingency plan will be established when the LTP is malfunctioned.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			✓	✓	WPCO Water-TM EIAO-TM Annex 6	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	imi	implement the measure? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks	
6.9.3 and SENTX latest design	WQ24	There will be sufficient redundancy in the system to handle the leachate flow even if one treatment train is down for maintenance. The leachate may be required to temporarily store within the landfill if the leachate storage lagoon are full and leachate cannot be transported to the LTP for treatment.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			√	~	WPCO Water-TM EIAO-TM Annex 6	Implemented
6.13	WQ25	Monitor the quality of effluent discharged from the LTP	To ensure discharge quality comply with WPCO requirement	Leachate treatment plant discharge point	SENTX Contractor			~	✓	WPCO Water-TM	Implemented
6.10.1	WQ26	Potential Leakage of Leachate Regular groundwater quality monitoring will be carried out to monitor the performance of the leachate containment system.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	SENTX Site	SENTX Contractor			✓	√	WPCO Water-TM	Implemented
6.10.1	WQ27	Maintenance and replacement of the capping system should be	To minimise potential water quality impacts on surrounding	SENTX Site	SENTX Contractor			✓	✓	WPCO Water-TM	Implemented



EIA Ref. EM&/Ref	EM&A Ref	Measures/ Mitigation Measures			Who to implement the measure?	im		to ment ure? ¤		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		carried out, if necessary, to prevent control infiltration and leachate seepage from any damaged cap.	water bodies arising from the leachate leakage.							6	
6.10.1	WQ28	Maintaining control of the leachate level through extraction	To minimise potential water quality impacts on surrounding water bodies arising from surface breakout of leachate.	SENTX Site	SENTX Contractor			√	✓	WPCO Water-TM EIAO-TM Annex 6	Implemented
Waste Mana	gement -	Construction Phase		·							
7.6.1	WM1	All the necessary waste disposal permits are obtained prior to the commencement of construction work.	To ensure compliance with relevant statutory requirements	Before construction works commence	SENTX Contractor	✓	✓			WDO	Implemented
7.6.1	WM2	Management of Waste Disposal The construction contractor will open a billing account with the EPD. Every construction waste or public fill load to be transferred to the Government waste	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓			WDO Waste Disposal (Charges for Disposal of Construction Waste) Regulation; Works Bureau Technical Circular	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	When to implement the measure? (1)			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		disposal facilities such as public fill reception facilities, sorting facilities, landfills will required a valid "chit" which contains the information of the account holder to facilitate waste transaction recording and billing to the waste producer. A trip-ticket system will also be established to monitor the disposal of construction waste at the SENT Landfill and to control fly-tipping. The trip-ticket system will be included as one of the contractual requirements and implemented by the contractor. A recording system for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established.								No.31/2004; and Annex 5 and Annex 6 of Appendix G of ETWBTC No. 19/2005)	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Measures/ Mitigation the Recommendation Measures Measures Main Co	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment (What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α			
7.6.1	WM3	Measures for the reduction of construction waste generation Inert and non-inert construction waste will be segregated and stored in different containers or skips to facilitate reuse or recycling of the inert waste and proper disposal of the non-inert construction waste. Specific areas of the work site will be designated for such segregation and storage if immediate use is not practicable.	To reduce construction waste generation	SENTX Site	SENTX Contractor					WDO EIAO-TM Annex 7	Implemented	
7.6.1	WM4	Chemical Waste The construction contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.	To ensure proper handling of chemical waste	SENTX Site	SENTX Contractor		~			WDO Code of Practice on the Packaging, Handling and Storage of Chemical Wastes	Implemented	



	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im		to ment t ure? ⁽¹⁾		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
7.6.1	WM5	Sewage An adequate number of portable toilets will be provided at the site to ensure that sewage from site staff is properly collected. The portable toilets will be desludged and maintained regularly by a specialist contractor.	To ensure proper handling of sewage	SENTX Site	SENTX Contractor	D	C	O/R	A	WDO EIAO-TM Annex 7	Implemented
7.6.1 and SENTX latest design	WM6	General Refuse General refuse will be stored in enclosed bins separately from construction and chemical wastes. The general refuse will be delivered to a transfer station or other landfill, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts. Recycling bins will be provided at strategic	To ensure proper handling of general refuse	SENTX Site	_		V			WDO EIAO-TM Annex 7	Implemented



Re	EM&A Ref	Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment ure? ⁴)	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D		O/R	A		
7.6.1	WM7	Staff Training At the commencement of the construction works, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling.	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓				Implemented
7.8	WM8	Environmental Monitoring & Audit Requirements Weekly audits of the waste management practices will be carried out during the construction phase. The audits examine all aspects of waste management including	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓			WDO	Implemented



-	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Measures/ Mitigation the		Location of the Measures	Who to implement the measure?	im	eası	ment ure? º		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		waste generation, storage,				D	С	O/R	Α			
		recycling, transport and disposal.										
Waste Manag	ement -	Operation/Restoration Pha	ase	I						I	I	
7.6.2 and SENTX latest design	WM9	Sludge In case off-site disposal is required, the Contractor will ensure that sludge generated from the LTP will be delivered in closed container to other waste disposal facility e.g. other landfills or a sludge treatment facility, for proper disposal on a daily basis.	To ensure proper handling of sludge	SENTX Site	SENTX Contractor			✓		WDO EIAO-TM Annex 7	Not applicable	
7.6.2	WM10	Chemical Waste The construction contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.	To ensure proper handling of chemical waste	SENTX Site	SENTX Contractor			✓		WDO EIAO-TM Annex 7 Code of Practice on the Packaging, Handling and Storage of Chemical Wastes	Implemented	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)		ement the sure? (1) or standards for the measure to achieve?		requirements or standards for the measure to	Implementation Status and Remarks
7.6.2	WM11	Sewage All sewage from the operation staff will be diverted to the LTP for treatment or public sewer, if available.	To ensure proper handling of sewage	SENTX Site	SENTX Contractor	D	С	O/R ✓	Α	WDO EIAO-TM Annex 7	Moved to mitigation measure under water quality WQ19. It is a measure for water quality rather than waste management.
7.6.2 and SENTX latest design	WM12	General Refuse General refuse will be stored in enclosed bins and disposed of at other landfills or transfer station on a daily basis to reduce odour, pest and litter impacts. Recycling bins will be provided at strategic locations to facilitate recovery of aluminium can and waste paper from the SENTX Site. Materials recovered will be sold for recycling.	To ensure proper handling of general refuse	SENTX Site	SENTX Contractor			√		WDO EIAO-TM Annex 7	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	_	oler ası		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
Landfill Gas H	Hazards -	- Design and Construction I	Phase							
8.6.2 and SENTX latest design	LFG1	Precautionary measures to be adopted by the contractors at the Project site and the adjacent development site within the landfill consultation zone are outlined in Paragraphs 8.3 to 8.49 of EPD's Landfill Gas Hazard Assessment Guidance Notes (the Guidance Note). Those precautionary measures applicable to the SENTX will be confirmed in the detailed Qualitative Landfill Gas Hazard Assessment to be submitted by the contractor.	'	All construction works area	SENTX Contractor		•		Paragraphs 8.3 to 8.49 of EPD's Landfill Gas Hazards Assessment Guidance Note EIAO-TM Annex 7	Implemented
8.6.2	LFG2	Monitoring will be undertaken when construction works are carried out in confined space within the consultation zone with reference to the monitoring requirements and procedures specified in	To protect workers from landfill gas risk	Confined space within the construction works area	SENTX Contractor		✓			Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment ure? º		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		Paragraphs 8.23 to 8.28 of EPD's Guidance Note will be followed. In the event of the trigger levels being exceeded, it is recommended that a person, such as the Safety Officer, is nominated, with deputies, to be responsible for dealing with any emergency which may occur due to landfill gas. In an emergency situation, the nominated person, or his deputies, shall have the necessary authority and shall ensure that the confined space is evacuated and the necessary works implemented for reducing the concentrations of gas. The appropriate organisations shall be contact.									
8.6.3	LFG4	Implementation of engineering measures	To protect workers from landfill gas risk	SENTX Site	SENTX Contractor	✓	✓	✓	✓	EIAO-TM Annex 7	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	-	to ment : ure? @		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		according to Contract Specification requirements. These measures will include the placement of liner and installation of landfill gas management system to contain, manage and control landfill gas.									
8.6.3	LFG5	Engineering measures to significant engineering measures will be required in the design of the SENTX to protect the staff working in the infrastructure area. These measures include a combination of passive and active systems (examples are recommended in EPD's Guidance Notes). Landfill gas monitoring boreholes will be installed at the edge of the waste slope between the waste and the new infrastructure area to	To protect workers from landfill gas risk	Infrastructure Area	SENTX Contractor	*	V			EPD's Landfill Gas Hazards Assessment Guidance Note EIAO-TM Annex 7	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	neasure? [©]	What requirements or standards for the measure to achieve?	Implementation Status and Remarks		
						D	С	O/R	Α		
		monitor the migration of landfill gas, if any.									
Landfill Gas H	azards ·	- Operation, Restoration an	d Aftercare Phas	ses	1						
8.6.4	LFG7	To train and ensure staff to take appropriate precautions at all times when entering enclosed spaces or plant rooms. Undertake regular monitoring of landfill gas at the perimeter boreholes to detect if there are any signs of off-site landfill gas migration. Prepare and implement emergency plan in case off-site landfill gas migration is detected. A permanent gas monitoring system with alarm will be installed and operated in all occupied on-site buildings.	To protect workers from landfill gas risk	SENTX Site	SENTX Contractor					Landfill Gas Hazards Assessment Guidance Note	Implemented
8.7 and SENTX latest design	LFG8	Environmental Monitoring & Audit Requirements Undertake regular monitoring of landfill gas within the	To protect workers from landfill gas risk	Within the SENTX and along the SENTX boundary	SENTX Contractor			✓	√	Landfill Gas Hazards Assessment Guidance Note	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	-	to ment ure? a		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		SENTX and along the SENTX				D	С	O/R	Α		
		boundary as required by the Contract Specification.									
Ecology - C	Construction	on Phase								1	
9.10.2	EC1	Measures to control construction runoff: Exposed soil areas will be minimised to reduce the contamination of runoff and erosion;	To minimise potential water quality impacts affecting ecological resources	All construction works area	SENTX Contractor		✓			EIAO-TM Annex 16 ProPECC PN 1/94 Water Pollution Control Ordinance (WPCO) EIAO-TM Annex 6	Implemented
		To prevent stormwater runoff from washing across exposed soil surfaces, perimeter channels will be constructed in advance of site formation works and earthworks and intercepting channels will be provided for example along the edge of excavation;								-	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	me	ple	ment : ure? @		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		Silt removal facilities, channels and manholes will be maintained and the deposited silt and grit will be removed regularly to ensure they are functioning properly at all times;			D	С	O/R	A	-	Deficiency of mitigation measures but rectified by the Contractor	
		Temporary covers such as tarpaulin will also be provided to minimise the generation of high suspended solids runoff;								-	Implemented
		The surface runoff contained any oil and grease will pass through the oil interceptors; and,								-	Implemented
		Control measures, including implementation of excavation schedules, lining and covering of excavated stockpiles will be implemented to minimise contaminated stormwater run-off from the SENTX site.								-	Implemented



EIA Ref.	EM&A Ref			Location of the Measures implement the measure?		im	eası	ment t		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
9.10.2 and	EC2	Good Construction Practice:	To minimise	SENTX Site	SENTX	D	C	O/R	Α	EIAO-TM Annex	Implemented
SENTX latest design		Fences along the boundary of the SENTX Site will be erected before the commencement of works to prevent vehicle movements, and encroachment of personnel, onto adjacent areas. The work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.	potential ecological impacts arising from the Project	SENTA SILE	Contractor					16	Implemented
Ecology - Ope	eration,	Restoration and Aftercare I	Phases	1				1		ı	
9.10.2	EC3	Measures for Controlling Leakage of Landfill Leachate Leachate will be contained within the SENTX Site by the proposed impermeable leachate containment system and collected by the installation of drainage system to prevent potential	To minimise potential water quality impact affecting the ecological resources	SENTX Site	SENTX Contractor			√	✓	EIAO-TM Annex 16 WPCO Water-TM EIAO-TM Annex 6	Implemented



	migration of leachate to								for the measure to achieve?	
	migration of leachate to				D	С	O/R	Α		
10.2 EC4	habitats in the vicinity.									
EC4	Measures for Controlling Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored.	To minimise potential landfill gas migration affecting ecological resources	SENTX Site	SENTX Contractor			V	V	EIAO-TM Annex 16	Implemented
EC5	The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX:	Compensation of habitat loss due to the Project	SENTX Site	SENTX Contractor			√	✓	EIAO-TM Annex 16	Not applicable
		Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. EC5 The following compensation planting is recommended as the mitigation measures for the habitat affected due to	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. EC5 The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: • Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. ECS The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of	Migration of Landfill Gas Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored. EC5 The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: Provision of 6 ha of



EIA Ref. EM& Ref		Measures/ Mitigation Measures	the Recommended the Measures imp		-	im	eası	ment)	What requirements or standards for the measure to achieve?	Implementation Status and Remarks
		to compensate the loss of shrubland; and • Provision of a mosaic of grassland and shrubland in the remaining areas of the SENTX Site. • Compensatory planting and restoration of the SENTX can be implemented progressively according to the filling plan of SENTX.				D	C	O/R	A		
9.10.3	EC6	The mixture of grassland, shrubland and woodland habitats are recommended to diversify the habitats for supporting various wildlife in particular butterflies, birds and herpetofauna and blend into the existing undisturbed ecological environment.	To diversify habitats	SENTX Site	SENTX Contractor			✓	•	EIAO-TM Annex 16	Not applicable
9.10.3	EC7	Indigenous plant species of shallow root system, softwood in nature and adaptive to sea shore habitat are recommended to be used	To enhance ecological value of the habitats	SENTX Site	SENTX Contractor			√	✓	EIAO-TM Annex 16	Not applicable



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	neasure? ധ			What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		in the restoration plan, which									
		can establish well in coastal									
		area with exposure to strong									
		wind and salt spray, with									
		sand soil base. Taking									
		consideration of the relative									
		poor substrate and the									
		difficulties of establishment of									
		some native trees in Hong									
		Kong, it is recommended to									
		include approximately 20% of									
		non-native tree species in the									
		compensatory woodland.									
		The non-native tree species									
		can serve as a nurse species									
		to facilitate the establishment									
		of the native tree species,									
		especially the shading, and it									
		can be replaced by									
		established native tree									
		species progressively. Plant									
		species can also make									
		reference to food plants of									
		butterfly species (in									
		particularly butterfly species									
		of conservation interests									



_	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment ture? (1)		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		recorded within the CWBCP).									
9.10.3	EC8	It is also recommended that a trial nursery for native plant species be set up to fine tone the planting matrix and management intensity of the recommended indigenous tree species for the restoration of the SENTX. It should be noted that native shrubs and tree species had been used for restoration of the existing SENT Landfill, native plant species that could not successfully be established on the existing SENT Landfill should be reviewed before the preparation of the compensatory planting list. Special care and intensive management of native plant should be implemented in order to ensure proper establishment of the native	To select the most suitable indigenous tree species for the SENTX	SENTX Site	SENTX Contractor				1	EIAO-TM Annex 16	Implemented



EIA Ref. EM& Ref	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	the Recommended the Measures imp	Who to implement the measure?	im	-	to ment t ure?		What requirements or standards for the measure to achieve?	Implementation Status and Remarks	
						D	С	O/R	Α		
		plants.									
9.12.1	EC9	Environmental Monitoring & Audit Requirements The implementation of the ecological mitigation measures should be checked as part of the environmental monitoring and audit procedures during the construction period.	To ensure that adverse ecological impacts are prevented	SENTX	SENTX Contractor		~	V	V	EIAO-TM Annex 16	Implemented
Landscape 8 10.6.5	LV1	CM1 - The construction area and area allowed for the contractor's office, leachate treatment plant and laboratory areas will be minimised to a practical minimum, to avoid impacts on adjacent landscape.	To minimise the landscape and visual impacts	SENTX Site	SENTX Contractor		✓			EIAO-TM Annex 18 and ETWBC 3/2006	Implemented
10.6.5	LV2	CM2 - Topsoil, where identified, will be stripped and stored for re-use in the construction of the soft	To minimise the landscape and visual impacts	All construction works area	SENTX Contractor		✓			EIAO-TM Annex 18	Not applicable



EIA Ref.	EM&A Ref	Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	the Measures im th the Measures im the Measure	Who to implement the measure?	im	-	to ment ure? ¤		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
10.6.5		landscape works, where practical. The Contract Specification will include storage and reuse of topsoil as appropriate.									
10.6.5	LV3	CM3 - All existing trees at the edges of the landfill will be carefully protected during construction. Detailed Tree Protection Specification will be provided in the Contract Specification. Under this Specification, the Contractor will be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas.	landscape and visual impacts	Potential impacted area	SENTX Contractor					EIAO-TM Annex 18 and ETWBC 3/2006	Implemented
10.6.5	LV4	CM4 - Trees unavoidably affected by the works will be transplanted, where	To minimise the landscape and visual impacts	Potential impacted area	SENTX Contractor	*	✓			EIAO-TM Annex 18 and ETWBC 3/2006	Implemented



EIA Ref.	EM&A Ref	Measures/ Mitigation Measures	Measures Mitigation the Recommendation Measure &	the Recommended Measure &		im	-	to ment ure? a		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
		necessary and practical. A detailed Tree Transplanting Specification will be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods will be allowed in the project programme.									
10.6.5 and SENTX latest design	LV5	CM5 - Within 3 months of taking possession of the SENTX Site, the Contractor will plant advance screen planting of native species at Light Standard size at 1.5m centres along the High Junk Peak Trail so as to screen views of the Works from the trail. Tree planting locations will be agreed with AFCD. Works will be completed within 9 months of taking possession of the SENTX Site.	To minimise the landscape and visual impacts	At High Junk Peak Hiking Trail	SENTX Contractor		V			EIAO-TM Annex 18	Implemented



EIA Ref. EM&/Ref	EM&A Ref	Measures/ Mitigation the Measures F	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	eası	ment t		What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	С	O/R	Α		
10.6.5	LV6	CM6 - The Contractor's office, leachate treatment plant and laboratory will be given an aesthetic treatment in earth tones to reduce their visual impact and albedo and blend them into the surrounding landscape.	To minimise the landscape and visual impacts	Infrastructure area	SENTX Contractor	•	V V			EIAO-TM Annex 18	Implemented
10.6.5	LV7	CM7 - The Contractor's office, leachate treatment plant and laboratory will be surrounded by a minimum of 5m wide and 0.75m high earth bund on the west and south sides planted with a dense screen of tree and shrub vegetation. Additional tree planting will be provided in unused spaces with thin infrastructure site, along access roads and in and around car parks. This will be supplemented with shrub planting, where appropriate.	To minimise the landscape and visual impacts	Infrastructure area	SENTX Contractor	*	V			EIAO-TM Annex 18 and ETWBC 7/2002	Not applicable



EIA Ref.	EM&A Ref	Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
10.6.5	LV8	CM8 - Planting trials will be carried out in an on-site nursery prior to implementation of the first phase of restoration to establish the best planting matrix and management intensity of the recommended plant materials	To minimise the landscape and visual impacts	SENTX Site	SENTX Contractor	D	C	O/R	Α	EIAO-TM Annex 18	Implemented
11.4.1 and SENTX latest design	LV9	for the restoration. During the preparation of the detailed landscape design plan, the design submission will be audited against the recommendation proposed in the <i>ER Report</i> by the Registered Landscape Architect from the ET.	To ensure the implementation of mitigation measures proposed in this EIA Report	SENTX Site	SENTX Contractor/ET	✓	✓ ✓			EIAO-TM Annex 18	Implemented
Landscape and 10.6.5 and SENTX latest design	LV10	 Operation/Restoration P OM1 - Landfill materials will be covered with general fill material or tarpaulin sheet on a daily basis to reduce visual impact. 	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			V		EIAO-TM Annex 18	Implemented



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	the Measures implement in the measure?		im me	When to implement the measure? (1)		implement the measure? (a) for the measure achiev			Implementation Status and Remarks
10.6.5 and SENTX latest design	LV11	OM2 - Filling and restoration will be phased during the course of operations in a minimum of 4 phases, the restoration of each phase to commence immediately on the completion of filling in that phase.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			√ ·		EIAO-TM Annex 18	Implemented	
10.6.5	LV12	OM3 - Catch fences will be erected at the perimeter of the waste boundary, to ensure that all waste stays within the site and is not blown into surrounding areas.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			✓		EIAO-TM Annex 18	Implemented	
10.6.5	LV13	OM4 - All night-time lighting will be reduced to a practical minimum both in terms of number of units and lux level and will be hooded and directional.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			~		EIAO-TM Annex 18	Implemented	
11.4.2 and SENTX latest design	LV14	The condition of the restoration plantation will be audited at monthly intervals by a Registered	To check the restoration plantation	SENTX Site	SENTX Contractor/ET			✓		EIAO-TM Annex 18	Not applicable	



EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	im	implement the measure? (1)			<u>-</u>	Implementation Status and Remarks
						D	С	O/R	Α		
		Landscape Architect from the ET.									





ANNEX C

MONITORING SCHEDULE FOR THIS REPORTING PERIOD

South East New Territories (SENT) Landfill Extension EM&A Impact Monitoring Schedule during Operation/ Restoration Phase

May 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			Dust Monitoring	Noise Monitoring	Groundwater Monitoring	4
5	6 Surface Water Monitoring	7 Dust Monitoring	8 Perimeter LFG Monitoring	9 Stack Monitoring	10 Stack Monitoring	11
	Service voids LFG Monitoring		Perimeter LFG Bulk Gas Sampling	Leachate Monitoring	VOCs Monitoring	
			Noise Monitoring			
12	13 Dust Monitoring	14 Noise Monitoring	15	16 Groundwater Monitoring	17	18
		Flammable Gas Monitoring		Additional Surface Water Monitoring		
19 Dust Monitoring	20 Noise Monitoring	21 Odour Monitoring	22	23	24	25 Dust Monitoring
		-				
26	27	28	29	30	31	
20	Noise Monitoring	20	27	Additional Surface Water Monitoring	Dust Monitoring	



ANNEX D AIR QUALITY



ANNEX D1

CALIBRATION CERTIFICATES FOR DUST MONITORING EQUIPMENT

Location I	D: AM1					Date of Calib	ration: 22-Apr-24			
Vame and	Model:	TISCH	HVS Mode	1 TE-5170		Next Calibrat	ion Date: 22-Jun-24			
						Operator:	P.F.Yeung			
				CONDITIO	ZNC					
	Tempera	ature (°C))	1014 25.0	1	Corrected Pre Temperature	essure (mm Hg) 760.1 (K) 298			
CALIBRATION ORIFICE										
			Make: Model: Serial#:	TISCH TE-5025A 2454		Qstd Slope Qstd Intercep	2.07544 -0.03205			
				CALIBRA	.TION					
Plate	H2O(L)	H20(R)	H2O	Qstd	I	IC	LINEAR			
No.	(in)	(in)	(in)	(m3/min)	(chart)	(corrected)	REGRESSION			
18	5.4	5.4	10.8	1.600	52	52.03	Slope= 33.386			
13	4.4	4.4	8.8	1.446	47	47.03	Intercept= -0.9831			
10	2.9	3.0	5.9	1.187	40	40.02	Corr. Coeff.= 0.9974			
7	2.2	2.2	4.4	1.027	33	33.02				
5 1.3 1.3 2.6 0.793 25 25.02										

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

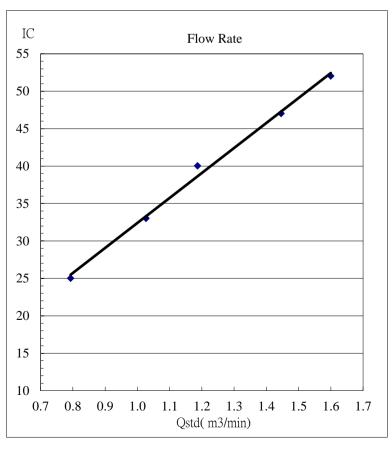
m = sampler slope

b = sampler intercept

= chart response

Tav = daily average temperature

Pav = daily average pressure



Location II Name and I		TISCH	HVS Mode	l TE-5	170		Date of C Next Cali Operator:	bration		:	22-A 22-J P.F.	un-2	4	
				CON	DITIC	ONS								
		el Pressu ature (°C	` - /		1014 25.0		Corrected Temperat			m Hg)		760. 29		
				CALI	BRA'	TION C	RIFICE							
			Make: Model: Serial#:	TE-50	SCH)25A 2454		Qstd Slop Qstd Inter					0754 0320		
				CALI	BRA'	ΓΙΟΝ								
Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qs (m3/		I (chart)	IC (correcte	ed)			LINE A		ION	
18 13 10	5.0 4.3 3.5	5.0 4.3 3.5	10.0 8.6 7.0	1.5 1.4 1.2	29	52 47 42	52.03 47.03 42.03			Slope= atercept= Coeff.=	3.559			
7 5	2.1	2.1 1.3	4.2 2.6	1.0 1.0 0.7	04	35 28	35.02 28.02		Con.	Cocii.–	0.7755	,		
Calulations:		T	T . 1/T . \ 1.1		IC 55				Flow	Rate				
Qstd = 1/m[S IC = I[Sqrt(F			I'std/I'a))-b]		50	-							<i>;</i>	
Qstd = stand IC = correcte					45	-								
I = actual ch m = calibrat	tor Qstd sl	ope			40	-								
b = calibrate Ta = actual t	temperatui	e during			35									
Pa = actual r					30 25	•								
_	or subsequent calculation of sampler flow: /m((I)[Sqrt(298/Tav)(Pav/760)]-b)													
	= sampler slope													
	= sampler intercept = chart response						ı	ı	ı		ı	ı	ı	
Tav = daily a Pav = daily a	_	_	2		10	0.7 0.	8 0.9	1.0	1.1 Ostd(1.2 m3/min)	1.3 1	.4	1.5	1.6

Location II	D: AM3					Date of Calib	ration:	22-Apr-24		
Name and	Model:	TISCH	HVS Mode	1 TE-5170		Next Calibrat	ion Date:	23-Jun-24		
						Operator:		P.F.Yeung		
				CONDITIO						
		el Pressu ature (°C	` • ′	1014 25.0	1	Corrected Pressure (mm Hg) 760.1 Temperature (K) 298				
CALIBRATION ORIFICE										
			Make: Model: Serial#:	TISCH TE-5025A 2454		Qstd Slope Qstd Intercep	t	2.07544 -0.03205		
				CALIBRA	TION					
Plate	H2O(L)	H20(R)	H2O	Qstd	Ι	IC		LINEAR		
No.	(in)	(in)	(in)	(m3/min)	(chart)	(corrected)		REGRESSION		
18	5.5	5.5	11.0	1.614	57	57.04	Slope=	= 26.552		
13	4.2	4.2	8.4	1.413	52	52.03	Intercept=	= 14.177		
10 3.4 3.4 6.8 1.273						47.03	Corr. Coeff.=	= 0.9952		
7	2.1	2.1	4.2	1.004	42	42.03				
5	1.3	1.4	2.7	0.808	35	35.02				

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

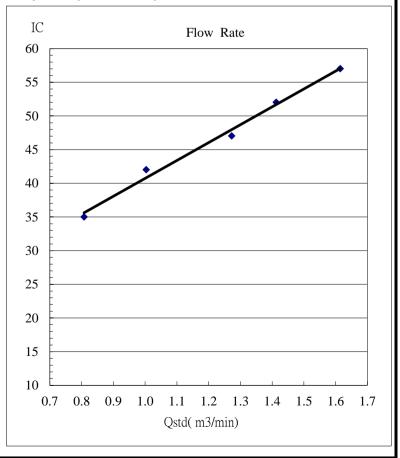
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



ocation ID: AM4					Date of Calib	ration:	22-Apr-24			
Name and Model: TIS	SCH HV	S Model	TE-5170		Next Calibrat	ion Date:	23-Jun-24			
					Operator:		P.F.Yeung			
			CONDITIO	ONS						
Sea Level F Temperatur	`	hpa)	1014 25.0		Corrected Pre Temperature	essure (mm Hg) (K)	760.1 298			
CALIBRATION ORIFICE										
		ke: del: ial#:	TISCH TE-5025A 2454		Qstd Slope Qstd Intercep	t	2.07544 -0.03205			
			CALIBRA	TION						
Plate H2O(L) H2	20(R)	H2O	Qstd	I	IC		LINEAR			
No. (in) ((in)	(in)	(m3/min)	(chart)	(corrected)		REGRESSION			
18 6.5	6.4	12.9	1.747	59	59.04	Slope=	32.028			
13 5.1	5.2	10.3	1.563	52	52.03	Intercept=	2.6869			
10 3.8	3.9	7.7	1.353	46	46.03	Corr. Coeff.=	0.9989			
7 2.5	2.4	4.9	1.083	38	38.02					
5 1.6	1.5	3.1	0.864	30	30.02					

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

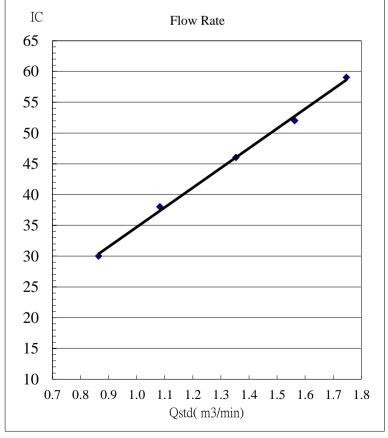
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





ANNEX D2 24-HOUR TSP MONITORING RESULTS

TABLE D2.1 24-HOUR TSP MONITORING RESULTS AT AM1

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP (μg/m³)
1 May 24	8:00	2 May 24	8:00	Cloudy	32
7 May 24	8:00	8 May 24	8:00	Fine	135
13 May 24	8:00	14 May 24	8:00	Sunny	150
19 May 24	8:00	20 May 24	8:00	Cloudy	241
25 May 24	8:00	26 May 24	8:00	Cloudy	32
31 May 24	8:00	1 Jun 24	8:00	Cloudy	57
				Average	108
				Min	32
				Max	241

FIGURE D2.1 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM1

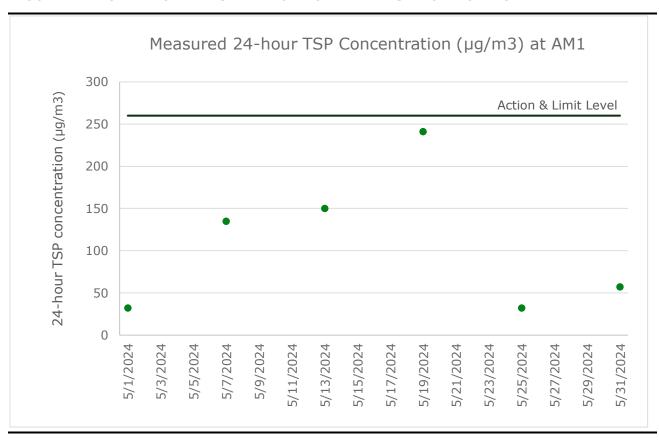


TABLE D2.2 24-HOUR TSP MONITORING RESULTS AT AM2

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP (μg/m³)
1 May 24	8:00	2 May 24	8:00	Cloudy	41
7 May 24	8:00	8 May 24	8:00	Fine	167
13 May 24	8:00	14 May 24	8:00	Sunny	117
19 May 24	8:00	20 May 24	8:00	Cloudy	154
25 May 24	8:00	26 May 24	8:00	Cloudy	61
31 May 24	8:00	1 Jun 24	8:00	Cloudy	49
				Average	98
				Min	41
				Max	167

FIGURE D2.2 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM2

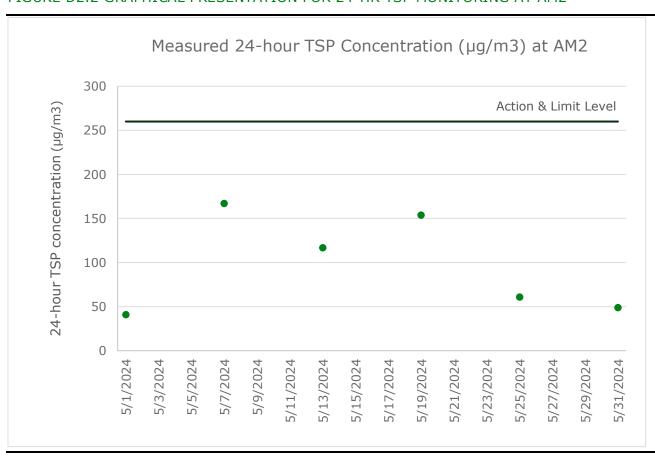


TABLE D2.3 24-HOUR TSP MONITORING RESULTS AT AM3

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP (μg/m³)
1 May 24	8:00	2 May 24	8:00	Cloudy	28
7 May 24	8:00	8 May 24	8:00	Fine	242
13 May 24	8:00	14 May 24	8:00	Sunny	216
19 May 24	8:00	20 May 24	8:00	Cloudy	122
25 May 24	8:00	26 May 24	8:00	Cloudy	56
31 May 24	8:00	1 Jun 24	8:00	Cloudy	96
				Average	127
	28				
				Max	242

FIGURE D2.3 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM3

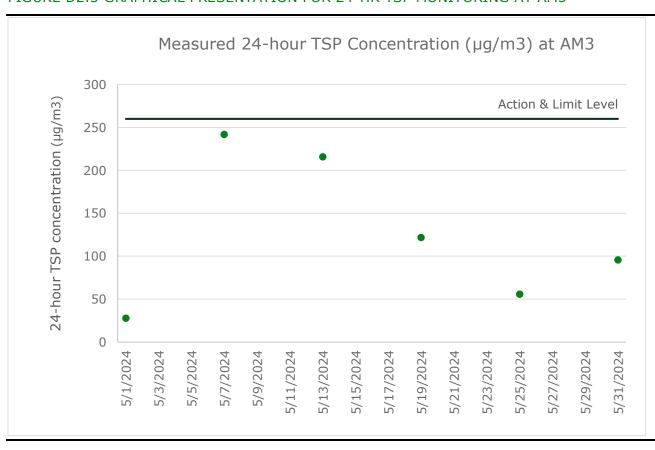
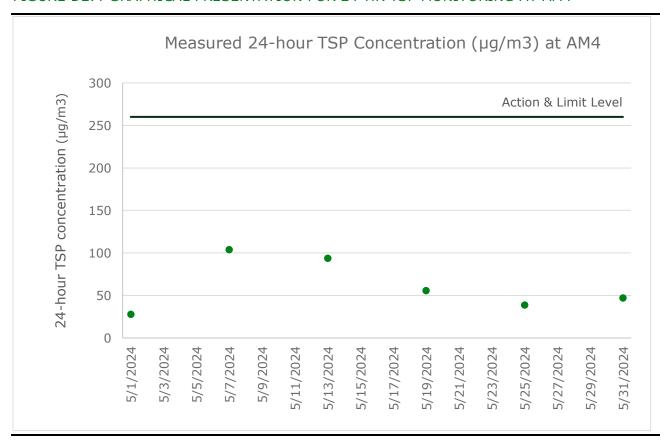


TABLE D2.4 24-HOUR TSP MONITORING RESULTS AT AM4

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP (μg/m³)
1 May 24	8:00	2 May 24	8:00	Cloudy	28
7 May 24	8:00	8 May 24	8:00	Fine	104
13 May 24	8:00	14 May 24	8:00	Sunny	94
19 May 24	8:00	20 May 24	8:00	Cloudy	56
25 May 24	8:00	26 May 24	8:00	Cloudy	39
31 May 24	8:00	1 Jun 24	8:00	Cloudy	47
				Average	61
				Min	28
				Max	104

FIGURE D2.4 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM4





ANNEX D3

EVENT AND ACTION PLAN FOR AIR QUALITY MONITORING

ANNEX D3 EVENT AND ACTION PLAN FOR AIR QUALITY MONITORING DURING OPERATION/ RESTORATION PHASE

Action										
Event	ET	IEC	Contractor							
Exceedance of Action/Limit Level for dust monitoring	 Identify the source(s) and investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures Ensure remedial measures are properly implemented Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to daily and continue until the monitoring results reduce to below action level 	 Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Take immediate action to avoid further exceedance Submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate 							
Exceedance of Action Level for odour	 Identify source(s) and investigate the cause(s) of exceedance or complaint Prepare the odour complaint form or the Notification of Exceedance within 24 hours Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures Ensure remedial measures are properly implemented Increase monitoring frequency to daily 	 Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Rectify any unacceptable practice Amend working methods as required Implement amended working methods, if necessary 							



Action									
Event	ET	IEC	Contractor						
	until odour not being detected for three consecutive days								
Exceedance of Limit Level for odour	 Identify source(s) and investigate the cause(s) of exceedance or complaint Prepare the odour complaint form or the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures Ensure remedial measures are properly implemented Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results 	 Verify the Notification of Exceedance Check with Contractor on the operating activities and implementation of odour mitigation measures Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Rectify any unacceptable practice Submit proposals for remedial measures to IEC within 3 working days of notification Implement the agreed proposal or amend working methods as required Resubmit proposals if problem still not under control 						
Exceedance of Limit Level for ambient VOCs, ammonia and H ₂ S at the monitoring locations	 Identify the source(s) and investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures Ensure remedial measures are properly implemented Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the 	 Verify the Notification of Exceedance Check with Contractor on the operating activities and implementation of landfill gas control measures Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Rectify any unacceptable practice Amend working methods as required Implement amended working methods, if necessary 						



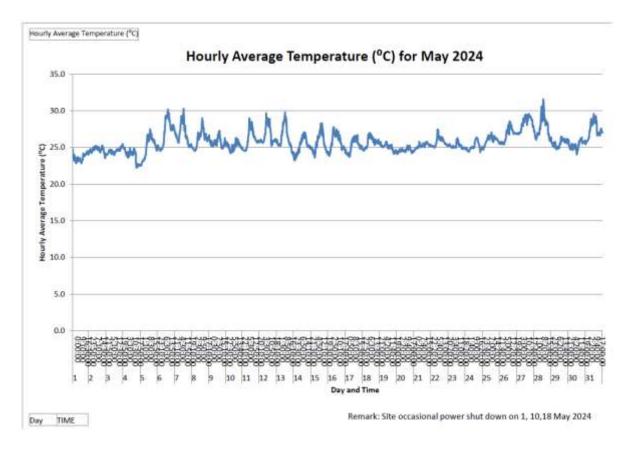
	Action									
Event	ET	IEC	Contractor							
	 results Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to monthly and continue until the monitoring results reduce to below limit level 									
Exceedance of Limit Level of stack emission of the thermal oxidizer, flares and generator	 Identify source(s) and investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures Ensure remedial measures are properly implemented Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to monthly when there are two consecutive exceedances and continue until the monitoring results reduce to below limit level 	 Verify the Notification of Exceedance Check with Contractor on the operating performance of the stack Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	Rectify any unacceptable performance Amend design as required Implement amended design, if necessary							

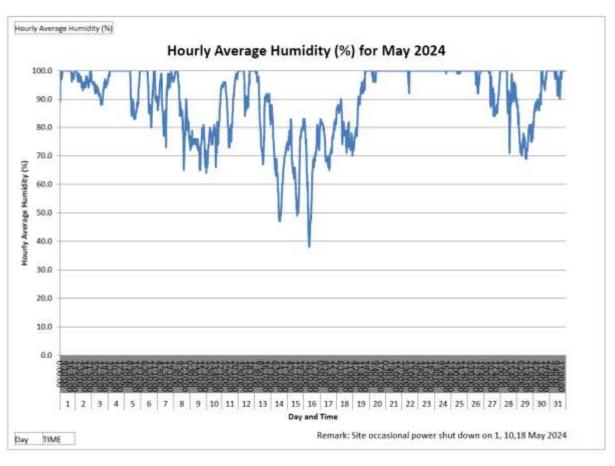




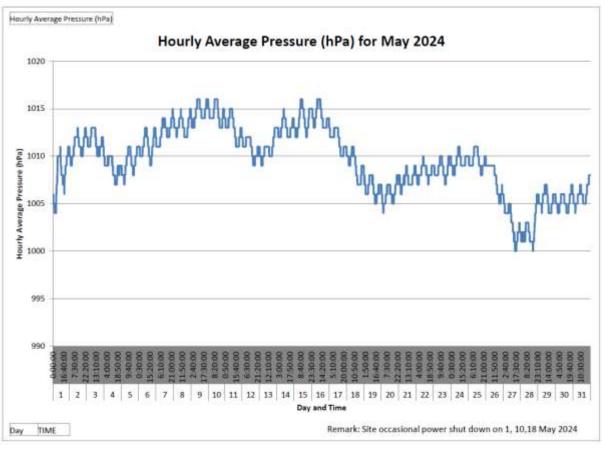
ANNEX D4 METEOROLOGICAL DATA

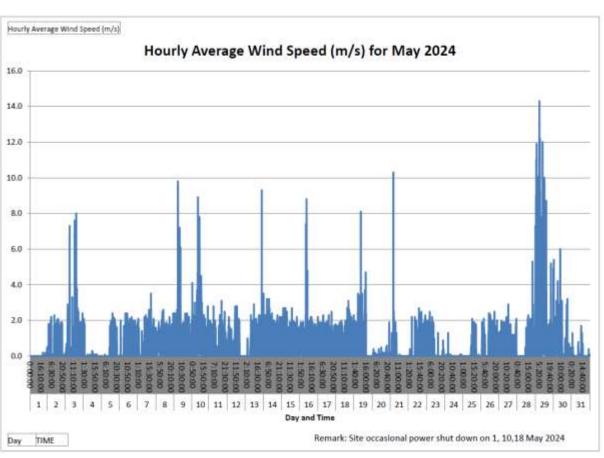
ANNEX D4 METEOROLOGICAL DATA



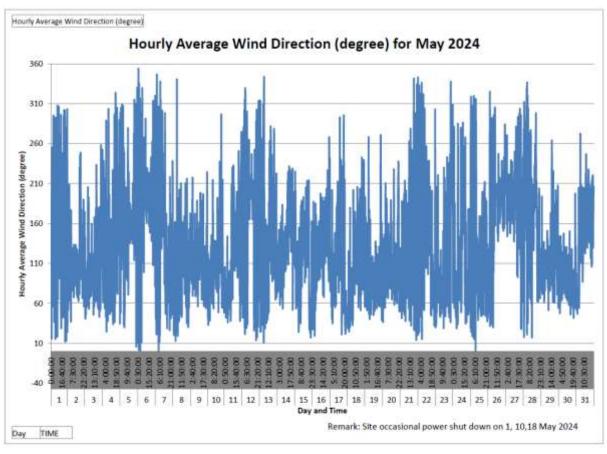


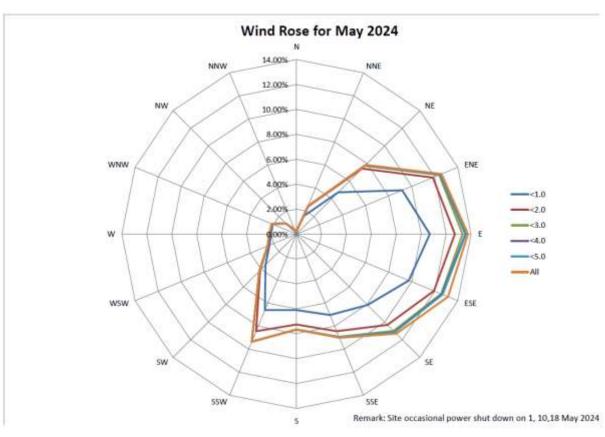




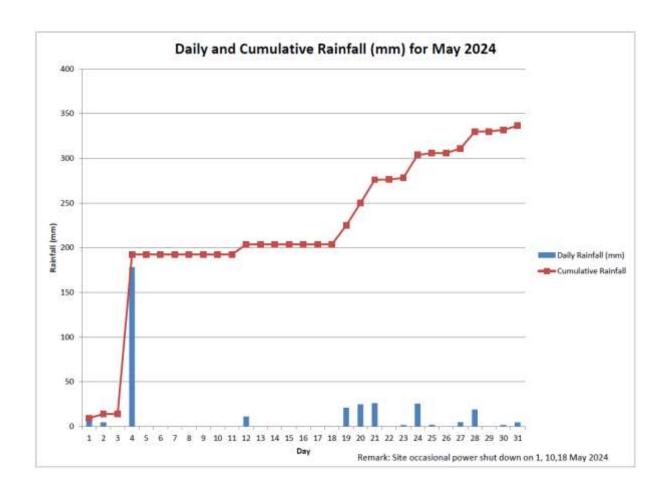
















ANNEX D5

CERTIFICATES OF THE QUALIFIED ODOUR PANELIST



This is to certify that

LAU MEI TUNG



Certificate No.: C23083

has participated in twelve (12) sets of individual N-Butanol screening test during 14 November 2023 - 21 November 2023

with Individual Threshold

: 47 ppb/v

Standard Deviation

: 1.3 ppb/v

and

fulfill the Requirement of the European Standard Method of Air Quality - Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

Gold Stamp: Successfully fulfilling the Panellist requirement since 2021

21 November 2023

21 November 2024

Issue Date

Valid Until

ung Lim Chee, Richard



This is to certify that

WONG HOYU

has participated in twelve (12) sets of individual N-Butanol screening test during 14 November 2023 - 21 November 2023

with Individual Threshold

: 47 ppb/v

Standard Deviation

: 1.4 ppb/v

and

fulfill the Requirement of the European Standard Method of Air Quality - Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

21 November 2023

21 November 2024

Issue Date

Valid Until

Fung Lim Chee, Richard

Certificate No.: C23085



This is to certify that

LEUNG CHING

has participated in twelve (12) sets of individual N-Butanol screening test during 14 November 2023 - 21 November 2023

with Individual Threshold

: 43 ppb/v

Standard Deviation

: 1.3 ppb/v

and

fulfill the Requirement of the European Standard Method of Air Quality -Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

21 November 2023

21 November 2024

Valid Until

ung Lim Chee, Richard

ALS Technichem (HK) Ptv Ltd

11/F Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, NT, Hong Kong

Tel: 852-2610 1044

Certificate No.: C23084



Certificate No.: C23086

Certificate for a Qualified Odour Panellist

This is to certify that

LAO KA LEONG, BILLY



has participated in twelve (12) sets of individual N-Butanol screening test during 14 November 2023 - 22 November 2023

with Individual Threshold

: 31 ppb/v

Standard Deviation

: 1.7 ppb/v

and

fulfill the Requirement of the European Standard Method of Air Quality - Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

Gold Stamp: Successfully fulfilling the Panellist requirement since 2021

22 November 2023

ALS Technichem (HK) Pty Ltd

22 November 2024

Issue Date

Valid Until

Fung Lim Chee, Ric



This is to certify that

Cheung Wai Hung

has participated in twelve (12) sets of individual N-Butanol screening test during 01-Dec-2022 to 06-Jun-2023

with Individual Threshold : 48 ppb

Standard Deviation : 1.44 ppb

and

fulfil the Requirement of the European Standard Method of Air Quality - Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

06 June 202305 June 2024Issue DateValid UntilFung Lim Chee, Richard

Certificate No.: C0337-01



This is to certify that

Chen Ci He, Wayne

has participated at least twelve (12) sets of individual N-Butanol screening test during 14-Nov-2023 to 21-Nov-2024

with Individual Threshold : 44 ppb

Standard Deviation : 1.50 ppb

and

fulfil the Requirement of the European Standard Method of Air Quality - Determination of Odour Concentration by Dynamic Olfactometry (BS EN 13725:2022) -

The Requirement of the Odour Threshold of n-Butanol in Nitrogen Gas in the Range of 20 - 80 ppb/v with at least 12 sets of individual threshold estimates and standard deviation less than 2.3

21 November 2023 20 November 2024 Fung Lim Chee, Richard

Certificate No.: C0337-01



ANNEX D6 ODOUR MONITORING RESULTS

TABLE D6.1 ODOUR MONITORING RESULTS

Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
21 May 24	Rainy	OP1	10:10	25.0	3.8	N	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP2	10:05	24.0	2.0	N	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP3	10:18	24.9	1.1	SW	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP4	10:20	25.4	0.2	W	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP5	10:22	25.5	1.2	E	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP6	10:24	25.3	3.2	NE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP7	10:27	24.4	1.6	N	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP8	10:31	25.4	2.0	SE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP9	10:35	25.7	1.4	NE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP10	10:37	24.9	3.3	SE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP11	10:54	24.8	2.2	Е	Yes	1	Waste smell	Cell 4X Tipping area	SENTx
21 May 24	Rainy	OP12	10:51	24.5	2.8	E	Yes	1	Waste smell	Cell 4X Tipping area	SENTx
21 May 24	Rainy	OP13	10:48	24.6	3.6	Е	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP14	10:49	24.6	2.6	Е	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP15 ^(a)	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	No safety access (e.g. soil too wet)
21 May 24	Rainy	OP16 ^(a)	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	No safety access (e.g. soil too wet)



Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
21 May 24	Rainy	OP17 ^(a)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No safety access (e.g. soil too wet)

Note:

(a) OP15 – OP17 are not accessible due to safety considerations.





ANNEX D7

THERMAL OXIDIZER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

TABLE D7.1 THERMAL OXIDISER STACK EMISSION MONITORING RESULTS

Parameters	Monitoring Results
NO ₂	1.18 gs ⁻¹
СО	0.03 gs ⁻¹
SO ₂	0.01 gs ⁻¹
Benzene	<2.0 x 10-4 gs ⁻¹
Vinyl chloride	<1.3 x 10 ⁻⁴ gs ⁻¹
Non-Methane Organic Carbons	<0.003 gs ⁻¹
Ammonia	0.0232 gs ⁻¹
Exhaust gas velocity	9.3 ms ⁻¹

TABLE D7.2 THERMAL OXIDISER STACK CONTINUOUS MONITORING RESULTS

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms ⁻¹) (a)
1 May 24	900	1226	
2 May 24	896	1227	_
3 May 24	903	1228	_
4 May 24	906	1224	
5 May 24	898	1213	
6 May 24	899	1222	
7 May 24	900	1225	
8 May 24	903	1227	
9 May 24	897	1224	
10 May 24	900	1225	
11 May 24	899	1228	
12 May 24	904	1230	
13 May 24	900	1214	
14 May 24	897	1226	-
15 May 24	900	1229	9.3
16 May 24	899	1228	9.3
17 May 24	899	1232	
18 May 24	896	1226	-
19 May 24	895	1225	-
20 May 24	900	1227	-
21 May 24	897	1227	
22 May 24	901	1227	
23 May 24	903	1232	
24 May 24	902	1225	-
25 May 24	903	1224	
26 May 24	900	1225	
27 May 24	907	1229	
28 May 24	903	1224	
29 May 24	901	1220	_
30 May 24	900	1217	_
31 May 24	894	1221	
Average	900	1225	-
Min	894	1213	-
Max	907	1232	-
Notes:			



CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169

Date	Gas Combustion	Exhaust Temperature (K)	Exhaust Gas Velocity
Date	Temperature (°C)		(ms ⁻¹) ^(a)

⁽a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

TABLE D7.3 LANDFILL GAS FLARE STACK EMISSION MONITORING RESULTS

Parameters	Monitoring Results
NO ₂	0.02 gs ⁻¹
со	0.02 gs ⁻¹
SO ₂	0.06 gs ⁻¹
Benzene	6.73 x 10 ⁻⁴ gs ⁻¹
Vinyl chloride	<1.01 x 10 ⁻⁴ gs ⁻¹
Non-Methane Organic Carbons	<0.002 gs ⁻¹
Exhaust gas velocity	8.9 ms ⁻¹



CLIENT: Green Valley Landfill Ltd.

PROJECT NO: 0465169

Annex D7 - Page 3

TABLE D7.4 LANDFILL GAS FLARE STACK CONTINUOUS MONITORING RESULTS

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms ⁻¹) ^(a)	Operation Status
Flare 1 – F	601			
1 May 24	826	1087		In Operation
2 May 24	862	1126		In Operation
3 May 24	860	1131		In Operation
4 May 24	886	1157		In Operation
5 May 24	843	1105		In Operation
6 May 24	897	1147		In Operation
7 May 24	855	1118		In Operation
8 May 24	891	1156		In Operation
9 May 24	854	1125		In Operation
10 May 24	832	1100		In Operation
11 May 24	845	1101		In Operation
12 May 24	860	1102		In Operation
13 May 24	857	1124		In Operation
14 May 24	857	1124		In Operation
15 May 24	877	1125	8.9	In Operation
16 May 24	869	1130	0.9	In Operation
17 May 24	880	1142		In Operation
18 May 24	878	1141		In Operation
19 May 24	872	1125		In Operation
20 May 24	895	1159		In Operation
21 May 24	873	1120		In Operation
22 May 24	848	1105		In Operation
23 May 24	860	1120		In Operation
24 May 24	862	1104		In Operation
25 May 24	864	1126		In Operation
26 May 24	884	1140		In Operation
27 May 24	898	1126		In Operation
28 May 24	872	1138		In Operation
29 May 24	885	1151		In Operation
30 May 24	893	1151		In Operation
31 May 24	845	1105		In Operation
Average	867	1126	-	
Min	826	1087	-	
Max	898	1159	-	



Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms ⁻¹) ^(a)	Operation Status
Flare 2 - F	602			
1 May 24	857	1109		In Operation
2 May 24	881	1142		In Operation
3 May 24	895	1159		In Operation
4 May 24	936	1189		In Operation
5 May 24	874	1137		In Operation
6 May 24	925	1181		In Operation
7 May 24	879	1136		In Operation
8 May 24	931	1188		In Operation
9 May 24	877	1132		In Operation
10 May 24	856	1117		In Operation
11 May 24	872	1128		In Operation
12 May 24	878	1122		In Operation
13 May 24	893	1157		In Operation
14 May 24	881	1151		In Operation
15 May 24	909	1137	8.9	In Operation
16 May 24	895	1153		In Operation
17 May 24	909	1172		In Operation
18 May 24	911	1157		In Operation
19 May 24	899	1144		In Operation
20 May 24	916	1179	_	In Operation
21 May 24	888	1150	_	In Operation
22 May 24	869	1130		In Operation
23 May 24	885	1141	_	In Operation
24 May 24	890	1131	_	In Operation
25 May 24	901	1159	_	In Operation
26 May 24	901	1152	_	In Operation
27 May 24	914	1158		In Operation
28 May 24	905	1171		In Operation
29 May 24	926	1179		In Operation
30 May 24	914	1173		In Operation
31 May 24	904	1169		In Operation
Average	896	1152	-	
Min	856	1109	-	
Max	936	1189	-	

Notes:

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.



TABLE D7.5 LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

Parameters	Monitoring Results	
NO ₂	0.084 gs ⁻¹	
СО	0.808 gs ⁻¹	
SO ₂	<0.001 gs ⁻¹	
Benzene	5.6 x 10 ⁻⁵ gs ⁻¹	
Vinyl chloride	<1.04 x 10 ⁻⁵ gs ⁻¹	
Non-Methane Organic Carbons	0.0037 gs ⁻¹	
Exhaust gas velocity	10.0 ms ⁻¹	
(a) The Landfill Gas Generator was under maintenance in the reporting period		

CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169

TABLE D7.6 LANDFILL GAS GENERATOR STACK CONTINUOUS MONITORING RESULTS

Date	Exhaust Temperature (K)	Exhaust Gas Velocity (ms ⁻¹) ^(a)	Operation Status
ENGA			
1 May 24	849		In Operation
2 May 24	854		In Operation
3 May 24	855		In Operation
4 May 24	-		Under Maintenance
5 May 24	-		Under Maintenance
6 May 24	-		Under Maintenance
7 May 24	-		Under Maintenance
8 May 24	-		Under Maintenance
9 May 24	-		Under Maintenance
10 May 24	-		Under Maintenance
11 May 24			Under Maintenance
12 May 24	-		Under Maintenance
13 May 24	858		In Operation
14 May 24	876		In Operation
15 May 24	-	10.0	Under Maintenance
16 May 24	-	10.0	Under Maintenance
17 May 24	-		Under Maintenance
18 May 24	859		In Operation
19 May 24	861		In Operation
20 May 24	867		In Operation
21 May 24	880		In Operation
22 May 24	868		In Operation
23 May 24	869		In Operation
24 May 24	-		Under Maintenance
25 May 24	-		Under Maintenance
26 May 24	-		Under Maintenance
27 May 24	882		In Operation
28 May 24	876		In Operation
29 May 24	875		In Operation
30 May 24	879		In Operation
31 May 24	881		In Operation
Average	868	-	
Min	849	-	
Max	882	-	



CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169

Date	Exhaust Temperature (K)	Exhaust Gas Velocity (ms ⁻¹) (a)	Operation Status
ENGB			
1 May 24	870		In Operation
2 May 24	869		In Operation
3 May 24	870		In Operation
4 May 24	869		In Operation
5 May 24	871		In Operation
6 May 24	871		In Operation
7 May 24	870		In Operation
8 May 24	867		In Operation
9 May 24	864		In Operation
10 May 24	868		In Operation
11 May 24	847		In Operation
12 May 24	848		In Operation
13 May 24	869		In Operation
14 May 24	849		In Operation
15 May 24	862	10.0	In Operation
16 May 24	867	10.0	In Operation
17 May 24	868		In Operation
18 May 24	870		In Operation
19 May 24	-		Under Maintenance
20 May 24	-		Under Maintenance
21 May 24	-		Under Maintenance
22 May 24	-		Under Maintenance
23 May 24	869		In Operation
24 May 24	869		In Operation
25 May 24	870		In Operation
26 May 24	871		In Operation
27 May 24	873		In Operation
28 May 24	-		Under Maintenance
29 May 24	-		Under Maintenance
30 May 24	-		Under Maintenance
31 May 24	-		Under Maintenance
Average	866	-	
Min	847	-	
Max	873	-	

Notes:

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.





ANNEX D8

AMBIENT VOCs, AMMONIA, H2S MONITORING RESULTS

TABLE D8.1 AMBIENT VOCS, AMMONIA AND H₂S MONITORING RESULTS

Parameters	Limit Level		Monitor	onitoring Results (µg m ⁻³)		
		AM1	AM2	АМЗ	AM4	
Ammonia	180	35	48	53	49	
H ₂ S	42	<15	<15	<15	<15	
Methane	NA ^(a)	0.00018 %(v/v)	0.0003 %(v/v)	0.00019 %(v/v)	0.00019 %(v/v)	
1.1.1-Trichloroethane	5,550	<0.8	<0.8	<0.8	<0.8	
1.2-Dibromoethane (EDB)	39	<1.0	<1.0	<1.0	<1.0	
1.2-Dichloroethane	210	0.3	0.3	0.4	0.3	
Benzene	33	<0.5	<0.5	<0.5	<0.5	
Butan-2-ol	667	<0.6	<0.6	<0.6	<0.6	
Butanethiol	4	<1.2	<1.2	<1.2	<1.2	
Carbon Disulphide	150	0.6	1.6	<0.5	0.5	
Carbon Tetrachloride	64	<0.6	<0.6	<0.6	<0.6	
Chloroform	99	<0.8	<0.8	<0.8	<0.8	
Decanes	3,608	<0.7	<0.7	<0.7	<0.7	
Dichlorobenzene	120	<1.0	<1.0	<1.0	<1.0	
Dichlorodifluoro- methane	NA ^(a)	1.6	1.6	1.8	1.8	
Dimethylsulphide	8	<0.2	<0.2	<0.2	<0.2	
Dipropyl ether	NA ^(a)	<0.8	<0.8	<0.8	<0.8	
Limonene	212	<0.4	<0.4	<0.4	<0.4	
Ethanethiol	13	<0.6	<0.6	<0.6	<0.6	
Ethanol	19,200	6.9	5.6	<3.8	10.7	
Ethyl butanoate	71	<1.0	<1.0	<1.0	<1.0	
Ethyl propionate	29	<0.8	<0.8	<0.8	<0.8	
Ethyl benzene	738	<0.5	<0.5	<0.5	<0.5	
Heptane	2,746	<0.8	<0.8	<0.8	<0.8	



Parameters	Limit Level	Monitoring Results (μg m ⁻³)			
		AM1	AM2	АМ3	AM4
Methanethiol	10	<0.4	<0.4	<0.4	<0.4
Methanol	2,660	64.1	67.8	32.8	65.8
Methyl butanoate	30	<0.8	<0.8	<0.8	<0.8
Methyl propionate	353	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	3,530	1.2	1.3	1.3	1.3
Butyl acetate	76	<1.0	<1.0	<1.0	<1.0
Butyl benzene	47	<1.0	<1.0	<1.0	<1.0
Nonane	11,540	<0.9	<0.9	<0.9	<0.9
Propyl benzene	19	<0.8	<0.8	<0.8	<0.8
Octane	7,942	<0.9	<0.9	<0.9	<0.9
Propyl propionate	276	<1.0	<1.0	<1.0	<1.0
Terpenes	NA ^(a)	<0.8	<0.8	<0.8	<0.8
Tetrachloroethylene	1,380	<0.7	<0.7	<0.7	<0.7
Toluene	1,244	<0.5	0.8	<0.5	<0.5
Trichloroethylene	5,500	<1.1	<1.1	<1.1	<1.1
Undecane	5,562	<1.2	<1.2	<1.2	<1.2
Vinyl Chloride	26	<0.3	<0.3	<0.3	<0.3
Xylenes	534	<0.5	0.5	<0.5	<0.5

Notes:

(a) No relevant WHO/USEPA/CARB's ambient criteria, odour thresholds and WEL available.





ANNEX D9

INVESTIGATION REPORTS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCE

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	9 May 2024
Time	13:34 - 14:26
Monitoring Location	Landfill Gas Flare 1 (F601)
Parameter	Benzene
Limit Levels	>0.000414 g/s
Measured Level	0.000673 g/s
Possible reason	As confirmed by the Contractor, Landfill Gas Flare 1 (F601) was under normal operating conditions during the sampling event. The landfill gas flare emission monitoring results (NO ₂ , CO, SO ₂ , Vinyl chloride, gas combustion temperature, exhaust temperature and exhaust gas velocity) at Landfill Gas Flare 1 (F601) on 9 May 2024 were well within the respective limit levels. It is possible that the slight exceedances of Benzene limit level measured on 9 May 2024 could be due to some short-term system instability (e.g. insufficient air, short gas residence time or ineffective mixing of landfill gas and air during the combustion). Hence, the Benzene exceedance at Landfill Gas Flare 1 (F601) on 9 May 2024 is considered Project related. In accordance with Table 3.8b of the updated EM&A Manual, repeat measurement was conducted on 17 June 2024 (it should be noted that the turnaround time of the laboratory analysis of the flue gas sample is 3 weeks and the results were available on 8 July 2024) to confirm findings. The Benzene concentration (<0.000121g/s) measured on 17 June 2024 is well below Limit Level. There is no consecutive exceedance of Benzene concentrations in the flue gas emission of Landfill Gas Flare 1 (F601). It should be noted that although the measured Benzene level exceeded the limit level of the EM&A programme (which was set based on the stack design parameters), the exceedance of Benzene on 9 May 2024 will not cause adverse air quality impact to the identified ASRs as the anticipated Benzene concentrations at the identified ASRs will still be well below the respective AQO criteria with reference to the findings of the operational air quality impact
	assessment of the SENTX Environmental Review Report.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitoring the operating conditions of the flare to avoid any exceedance of the Limit Levels.

	ET will continue to closely monitor the landfill gas flare stack emission monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 11 July 2024



ANNEX E

NOISE



ANNEX E1

CALIBRATION CERTIFICATES FOR NOISE MONITORING EQUIPMENT



Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration 校正證書

證書編號

C235237

ITEM TESTED / 送檢項目 (Job No. / 序引編號: IC23-1753)

Date of Receipt / 收件日期: 22 August 2023

Certificate No.:

Description / 儀器名稱

Precision Acoustic Calibrator

Manufacturer / 製造商

LARSON DAVIS

Model No. / 型號

CAL200

Serial No. / 編號

16878

Supplied By / 委託者

Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,

New Territories, Hong Kong

TEST CONDITIONS/測試條件

Temperature / 溫度 :

Relative Humidity / 相對濕度 :

 $(50 \pm 25)\%$

Line Voltage / 電壓 :

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期

9 September 2023

TEST RESULTS / 測試結果

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

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

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

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

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

Tested By 測試

Engineer

Certified By

H C Chan

Date of Issue 簽發日期

12 September 2023

核證

Engineer

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

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



Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration 校正證書

證書編號

Certificate No.:

C235237

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

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

3. Test equipment:

Equipment ID

CL130 CL281 TST150A Description

Universal Counter

Multifunction Acoustic Calibrator Measuring Amplifier

Certificate No. C233799

CDK2302738 C221750

Test procedure: MA100N.

5. Results:

4.

Sound Level Accuracy 5.1

UUT	Measured Value	Mfr's Limit	Uncertainty of Measured Value
Nominal Value	(dB)	(dB)	(dB)
94 dB, 1 kHz	93.95	± 0.2	± 0.20
114 dB 1 kHz	113 95		

5.2 Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's	Uncertainty of Measured Value
(kHz)	(kHz)	Limit	(Hz)
1	1 000	1 kHz ± 1 %	±1

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

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

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

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

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Sun Creation Engineering Limited Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No.:

C237486

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號: IC23-2475)

Date of Receipt / 收件日期: 8 December 2023

Description / 儀器名稱

Sound Level Meter

Manufacturer / 製造商

Rion

Model No. / 型號

NL-52 01010406

Serial No. / 編號 Supplied By / 委託者

Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,

New Territories, Hong Kong

TEST CONDITIONS/測試條件

Temperature / 温度 :

 $(23 \pm 2)^{\circ}$ C

Relative Humidity / 相對濕度 :

 $(50 \pm 25)\%$

Line Voltage / 電壓

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期

31 December 2023

TEST RESULTS / 測試結果

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

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

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

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

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies

- Fluke Everett Service Center, USA

Tested By 測試

HT Wong

Assistant Engineer

Certified By 核證

Lee

Date of Issue 簽發日期

Website/網址: www.suncreation.com

3 January 2024

Engineer

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

written approval of this laboratory. 本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No.:

C237486

證書編號

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

Equipment ID

Description

Certificate No.

CL280

40 MHz Arbitrary Waveform Generator

C230306

CL281

Multifunction Acoustic Calibrator

CDK2302738

- 5. Test procedure: MA101N.
- 6. Results:
- 6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Limit
30 - 130	L	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
30 - 130	L_{A}	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.0

IEC 61672 Class 1 Limit: \pm 0.6 dB per 10 dB step and \pm 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting			Applied Value		UUT	IEC 61672	
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Limit (dB)
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
	**		Slow		2	94.0	± 0.3

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

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Fax/傳真: (852) 2744 8986

Tel/電話: (852) 2927 2606



Sun Creation Engineering Limited **Calibration & Testing Laboratory**

Certificate of Calibration

校正證書

Certificate No.:

C237486

證書編號

6.3 Frequency Weighting

A-Weighting 6.3.1

	UUT	Setting		Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Class 1 Limit (dB)
30 - 130	L _A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
				(500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	$+1.2\pm1.6$
					4 kHz	95.0	$+1.0 \pm 1.6$
					8 kHz	93.0	-1.1 (+2.1; -3.1)
					16 kHz	86.0	-6.6 (+3.5; -17.0)

C-Weighting 6.3.2

	UUT	Setting		Applied Value] UUT	IEC 61672
Range	Function	Frequency	Time	Level	Freq.	Reading	Class 1 Limit
(dB)		Weighting	Weighting	(dB)		(dB)	(dB)
30 - 130	L_{C}	С	Fast	94.00	63 Hz	93.1	-0.8± 1.5
					125 Hz	93.8	-0.2 ± 1.5
1					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1; -3.1)
					16 kHz	84.1	-8.5 (+3.5; -17.0)

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

Certificate of Calibration 校正證書

Certificate No.:

C237486

證書編號

义止战百

Remarks: - UUT Microphone Model No.: UC-59 & S/N: 13748

- Mfr's Limit: IEC 61672 Class 1

- Uncertainties of Applied Value : 94 dB : 63 Hz - 125 Hz : \pm 0.35 dB

250 Hz - 500 Hz : $\pm 0.30 \text{ dB}$ 1 kHz : $\pm 0.20 \text{ dB}$ 2 kHz - 4 kHz : $\pm 0.35 \text{ dB}$ 8 kHz : $\pm 0.45 \text{ dB}$ 16 kHz : $\pm 0.70 \text{ dB}$

104 dB : 1 kHz : \pm 0.10 dB (Ref. 94 dB) 114 dB : 1 kHz : \pm 0.10 dB (Ref. 94 dB)

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

Note:

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

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

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

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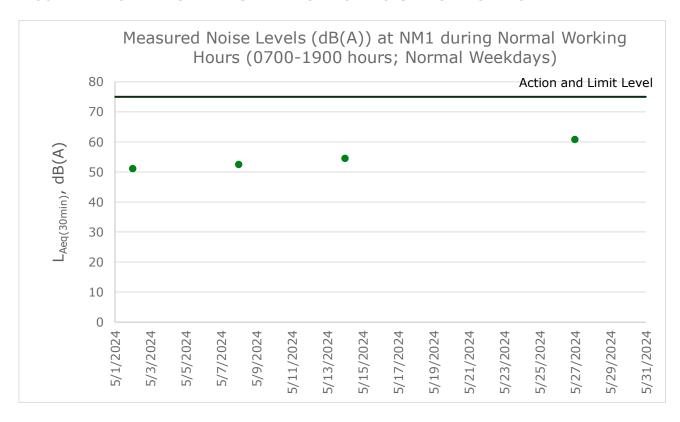


ANNEX E2 NOISE MONITORING RESULTS

TABLE E2.1 MEASURED NOISE LEVELS (DB(A)) AT NM1 DURING NORMAL WORKING HOURS (0700-1900 HOURS; NORMAL WEEKDAYS)

Date	Start Time	Finish Time	Weather	L _{10 (30min)}	L _{90 (30min)}	L _{eq (30min)}
2 May 24	14:49	15:19	Cloudy	55.4	53.6	51.1
8 May 24	10:42	11:12	Sunny	54.8	49.5	52.5
14 May 24	9:44	10:14	Sunny	55.8	50.8	54.5
20 May 24	10:31	11:01	Rainy	Monitoring was cancelled due to adverse weather.		
27 May 24	10:53	11:23	Cloudy	62.1	54.3	60.8
					Average	54.7
Min						
Max						

FIGURE E2.1 GRAPHICAL PRESENTATION FOR NOISE MONITORING AT NM1





ANNEX E3

EVENT AND ACTION PLAN FOR NOISE MONITORING

ANNEX E3 EVENT AND ACTION PLAN FOR OPERATIONAL NOISE MONITORING

	Action								
Event	ET	IEC	Contractor						
Action Level	 Identify the source(s) and investigate the cause(s) of exceedance and complaint Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring 	 Verify the Notification of Exceedance Check monitoring data submitted by ET Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	Submit proposals for remedial measures to IEC Implement the agreed proposals						



Action								
Event	ET	IEC	Contractor					
Limit Level	 Identify the source(s) and investigate the cause(s) of exceedance and complaint Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD whether the cause of exceedance is due to the Project Analyse the operation of SENTX and investigate the causes of exceedance Provide interim report to Contractor, IEC, Project Proponent and EPD the causes of the exceedances Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Report the remedial measures implemented and the additional monitoring results to Contactor, IEC, Project Proponent and EPD Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring 	 Verify the Notification of Exceedance Check monitoring data submitted by ET Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Take immediate measures to avoid further exceedance Submit proposals for remedial measures to IEC within 3 working days of notification Implement the agreed proposals Resubmit proposals if problem still not under control Stop the relevant activity of works as determined by the Project Proponent until the exceedance is abated 					





ANNEX F

WATER QUALITY



ANNEX F1

CALIBRATION CERTIFICATES FOR SURFACE WATER QUALITY MONITORING EQUIPMENT



11/F., Chung Shun Knitting Centre,

1 - 3 Wing Yip Street,

Kwai Chung, N.T., Hong Kong

T: +852 2610 1044 F: +852 2610 2021 www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR IVAN LEUNG WORK ORDER: HK2410348

CLIENT: ALS TECHNICHEM (HK) PTY LTD

ADDRESS: 11/F., CHUNG SHUN KNITTING CENTRE, **SUB-BATCH:** 0

1-3 WING YIP STREET, KWAI CHUNG, N.T. LABORATORY: HONG KONG

DATE RECEIVED: 15-Mar-2024 **DATE OF ISSUE:** 20-Mar-2024

GENERAL COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

This report superseded any previous report(s) with same work order number.

EQUIPMENT INFORMATION

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.

Equipment Type: Multifunctional Meter Service Nature: Performance Check

Scope: Conductivity, Dissolved Oxygen, pH Value, Turbidity, Salinity and Temperature

Brand Name/ Model No.: [HORIBA]/ [U-52G]
Serial No./ Equipment No.: [AWE7D2V4]/ [N/A]
Date of Calibration: 19-March-2024

16:5

Ms. Lin Wai Yu, Iris

Assistant Manager - Inorganics

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/ Model No.:

[HORIBA]/[U-52G]

Serial No./

Equipment No.:

[AWE7D2V4]/[N/A]

Date of Calibration:

19-March-2024

Date of Next Calibration:

19-June-2024

PARAMETERS:

Conductivity Method

Method Ref: APHA (23rd edition), 2510B

Expected Reading (µS/cm)	ted Reading (μS/cm) Displayed Reading (μS/cm)			
146.9	151	+2.8		
6667	6520	-2.2		
12890	12500	-3.0		
58670	53500	-8.8		
	Tolerance Limit (%)	±10.0		

Dissolved Oxygen

Method Ref: APHA (23rd edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)		
2.28	2.26	-0.02		
5.88	5.82	-0.06		
7.30	7.36	+0.06		
	Tolerance Limit (mg/L)	±0.20		

pH Value

Method Ref: APHA (23rd edition), 4500H: B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)		
4.0	3.92	-0.08		
7.0	6.95	-0.05		
10.0	10.03	+0.03		
	Tolerance Limit (pH unit)	±0.20		

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

Ms. Lin Wai Yu, Iris

Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/ Model No.:

[HORIBA]/[U-52G]

Serial No./

Equipment No.:

[AWE7D2V4]/[N/A]

Date of Calibration:

19-March-2024

Date of Next Calibration:

19-June-2024

PARAMETERS:

Turbidity Method Ref: APHA (23rd edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)		
0	0.0			
4	4.3	+7.5		
40	38.0	-5.0		
80	79.8	-0.3		
400	376	-6.0		
800	769	-3.9		
	Tolerance Limit (%)	±10.0		

Salinity Method Ref: APHA (23rd edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)		
0	0.01			
10	9.34	-6.6		
20	18.40	-8.0		
30	27.47	-8.4		
	Tolerance Limit (%)	±10.0		

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

Ms. Lin Wai Yu, Iris

Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/

[HORIBA]/[U-52G]

Model No.: Serial No./

. . . .

Equipment No.:

[AWE7D2V4]/[N/A]

Date of Calibration:

19-March-2024

Date of Next Calibration:

19-June-2024

PARAMETERS:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)		
9.0	10.61	+1.6		
25.0	25.63	+0.6		
44.0	43.62	-0.4		
	Tolerance Limit (°C)	±2.0		

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

Ms. Lin Wai Yu, Iris

Assistant Manager - Inorganics



ANNEX F2

SURFACE WATER QUALITY MONITORING RESULTS

TABLE F2.4 SURFACE WATER QUALITY MONITORING RESULTS

Date				6 May 24	6 May 24	6 May 24	30 May 24	30 May 24	30 May 24
		Limit Level (DP3)	Limit Level (DP6)	DP3	DP6	DP6 (Duplicate)	DP3	DP6	DP3 (Duplicate)
On-site Meas	surement								
pH Value	pH Unit	6 - 9	6 - 9	8.4	7.8	7.8	7.6	8.1	7.6
Electrical Conductivity	μS/cm	-	-	891	289	290	912	313	910
Dissolved Oxygen	mg/L	-	-	7.5	6.8	6.9	7.4	9.1	7.4
Volume Discharge	m³	-	-	6340	_ (a)	_ (a)	2170	27	2170
Laboratory A	nalysis								
Bicarbonate	mg/L	-	-	154	70	71	-	-	-
Carbonate	mg/L	-	-	6	<1	<1	-	-	-
Suspended Solids (SS)	mg/L	30	20	3.6	22	26.3	-	34.3	-
Ammonia- nitrogen	mg/L	0.5	7.1	1.38	0.02	0.02	0.18	-	0.16
Chloride	mg/L	-	-	73	26	25	-	-	-
Nitrite- nitrogen	mg/L	-	-	0.39	0.03	0.03	-	-	-
Phosphate	mg/L	5	5	0.04	0.01	<0.01	-	-	-
Sulphate	mg/L	-	-	134	32	32	-	-	-
Sulphide	mg/L	2.5	2.5	<0.1	<0.1	<0.1	-	-	-



Total Kjeldahl Nitrogen(TKN)	mg/L	_	-	2.5	0.3	0.3	_	_	_
Nitrate- nitrogen	mg/L	-	-	2.42	0.67	0.66	-	-	-
Total Nitrogen (TN)	mg/L	50	50	5.3	1	1	-	-	-
Biochemical Oxygen Demand	mg/L	20	20	<2	<2	<2	-	-	-
Chemical Oxygen Demand	mg/L	80	30	16	11	10	-	-	-
Oil & Grease	mg/L	20	20	<5	<5	<5	-	-	-
Total Organic Carbon	mg/L	-	-	5	2	3	-	-	-
Boron	μg/L	1100	1100	160	40	40	-	-	-
Calcium	mg/L	-		90	29.6	30.6	-	-	-
Mercury	μg/L	1	1	<0.20	<0.20	<0.20	-	-	-
Magnesium	mg/L	-	-	7.97	2.26	2.33	-	-	-
Sodium	mg/L	-	-	57	17.6	19.7	-	-	-
Iron	mg/L	3	3	<0.04	<0.04	<0.04	-	-	-
Potassium	mg/L	-	-	12.7	6.93	7.21	-	-	-
Cadmium	μg/L	1	1	<0.2	<0.2	<0.2	-	-	-
Chromium	μg/L	300	300	2	<1	<1	-	-	-
Copper	μg/L	300	300	2	<1	<1	-	-	-



Lead	μg/L	300	<1	<1	<1		
Manganese	μg/L	-	6	2	6		
Nickel	μg/L	300	<1	<1	<1		
Zinc	μg/L	-	<10	<10	213		

Note:

(a) The flow meter of DP6 is under maintenance.





EVENT AND ACTION PLAN FOR WATER QUALITY MONITORING

ANNEX F3 EVENT AND ACTION PLAN FOR WATER QUALITY MONITORING DURING OPERATION/ RESTORATION PHASE

	Action				
Event	ET	IEC	Contractor		
Exceedance of Limit Level for surface water monitoring	 Identify source(s) of impact and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to weekly if exceedance is due to the Project until no exceedance of Limit Level 	 Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Take immediate action to avoid further exceedance Submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate 		
Exceedance of Limit Level for groundwater monitoring	Identify source(s) of impact and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented	 Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Divert groundwater collected at the collection sumps to the leachate treatment plant Submit proposals for remedial measures to IEC Rectify any unacceptable practice or design Amend working methods as required Implement amended working methods, if necessary 		



	Action				
Event	ET	IEC	Contractor		
	 Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to weekly if exceedance is due to the Project until no exceedance of Limit Level 				
Exceedance of Limit Level for leachate level	 Investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented 	 Verify the Notification of Exceedance Check with Contractor on the operating activities and performance of the leachate collection system Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Check the performance of the leachate collection system Rectify any unacceptable practice; Amend leachate collection design if required Implement amended leachate collection system, if necessary 		
Exceedance of Limit Level of effluent discharge from LTP	 Investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Repeat measurement to confirm finding if exceedance is due to the Project 	 Verify the Notification of Exceedance Check with Contractor on the operation performance of the LTP Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Rectify any unacceptable practice; Carry out remedial measures or amend design as required Implement amended design, if necessary 		



	Action					
Event	ET	IEC	Contractor			
	Increase monitoring frequency to weekly until no exceedance of Limit Level					





CALIBRATION CERTIFICATES FOR EFFLUENT QUALITY MONITORING EQUIPMENT



ALS Technichem (HK) Pty Ltd

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1 - 3 Wing Yip Street,

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR IVAN LEUNG WORK ORDER: HK2409677

CLIENT: ALS TECHNICHEM (HK) PTY LTD

ADDRESS: 11/F., CHUNG SHUN KNITTING CENTRE, SUB-BATCH:

1-3 WING YIP STREET, KWAI CHUNG, N.T. LABORATORY: HONG KONG

DATE RECEIVED: 11-Mar-2024 **DATE OF ISSUE:** 14-Mar-2024

GENERAL COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

This report superseded any previous report(s) with same work order number.

EQUIPMENT INFORMATION

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.

Equipment Type: pH meter

Service Nature: Performance Check

Scope: pH Value and Temperature

Brand Name/ Model No.: [LUTRON]/ [PH-208]

Serial No./ Equipment No.: [AL.59355/TF31039]/ [HK2141]

Date of Calibration: 12-March-2024

16:5

Ms. Lin Wai Yu, Iris Assistant Manager - Inorganics

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WORK ORDER: HK2409677

SUB-BATCH: 0

DATE OF ISSUE: 14-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

pH meter

Brand Name/ Model No.:

[LUTRON]/[PH-208]

Serial No./

Equipment No.:

[AL.59355/TF31039]/ [HK2141]

Date of Calibration:

12-March-2024

Date of Next Calibration:

12-June-2024

PARAMETERS:

pH Value

Method Ref: APHA (23rd edition), 4500H: B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	4.11	+0.11
7.0	7.05	+0.05
10.0	10.01	+0.01
	Tolerance Limit (pH unit)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
7.5	8.4	+0.9
22.5	22.8	+0.3
44.0	43.8	-0.2
	Tolerance Limit (°C)	±2.0

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

Ms. Lin Wai Yu, Iris



LEACHATE LEVELS MONITORING RESULTS

TABLE F5.1 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.1X (CELL 1X))

Date	Meter No.X1 (cm)	Meter No.X2 (cm)	Average (cm)
Pump Station No.	1X (Cell 1X)		
1 May 24	102	119	111
2 May 24	102	119	111
3 May 24	102	119	111
4 May 24	128	117	123
5 May 24	117	118	118
6 May 24	106	119	113
7 May 24	102	119	111
8 May 24	102	119	111
9 May 24	102	119	111
10 May 24	102	115	109
11 May 24	102	117	110
12 May 24	102	117	110
13 May 24	102	117	110
14 May 24	102	119	111
15 May 24	102	119	111
16 May 24	102	119	111
17 May 24	102	119	111
18 May 24	102	119	111
19 May 24	104	119	112
20 May 24	102	106	104
21 May 24	104	111	108
22 May 24	104	106	105
23 May 24	102	117	110
24 May 24	102	111	107
25 May 24	104	93	99
26 May 24	103	106	105
27 May 24	102	119	111
28 May 24	102	119	111
29 May 24	102	99	101
30 May 24	102	117	110
31 May 24	102	111	107
Average	104	115	109
Min	102	93	99
Max	128	119	123



TABLE F5.2 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.2X (CELL 2X))

Date	Meter No.X3 (cm)	Meter No.X4 (cm)	Average (cm)
Pump Station No.	2X (Cell 2X)		
1 May 24	102	119	111
2 May 24	102	119	111
3 May 24	102	119	111
4 May 24	102	119	111
5 May 24	102	119	111
6 May 24	102	119	111
7 May 24	102	119	111
8 May 24	102	119	111
9 May 24	102	119	111
10 May 24	104	113	109
11 May 24	104	122	113
12 May 24	104	122	113
13 May 24	104	122	113
14 May 24	102	119	111
15 May 24	104	124	114
16 May 24	106	126	116
17 May 24	109	128	119
18 May 24	111	97	104
19 May 24	102	119	111
20 May 24	102	122	112
21 May 24	106	99	103
22 May 24	102	119	111
23 May 24	102	114	108
24 May 24	106	124	115
25 May 24	109	128	119
26 May 24	111	123	117
27 May 24	113	117	115
28 May 24	115	135	125
29 May 24	120	137	129
30 May 24	120	139	130
31 May 24	120	139	130
Average	106	121	114
Min	102	97	103
Max	120	139	130



TABLE F5.3 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.3X (CELL 3X))

Date	Meter No.X5 (cm)	Meter No.X6 (cm)	Average (cm)
Pump Station No.	3X (Cell 3X)		
1 May 24	114	114	114
2 May 24	111	111	111
3 May 24	117	117	117
4 May 24	115	111	113
5 May 24	115	113	114
6 May 24	115	115	115
7 May 24	102	102	102
8 May 24	113	113	113
9 May 24	119	119	119
10 May 24	104	104	104
11 May 24	111	111	111
12 May 24	115	115	115
13 May 24	119	119	119
14 May 24	102	102	102
15 May 24	108	108	108
16 May 24	113	113	113
17 May 24	115	115	115
18 May 24	117	117	117
19 May 24	119	119	119
20 May 24	106	106	106
21 May 24	113	113	113
22 May 24	104	104	104
23 May 24	111	111	111
24 May 24	117	117	117
25 May 24	113	113	113
26 May 24	112	112	112
27 May 24	111	111	111
28 May 24	99	99	99
29 May 24	113	113	113
30 May 24	119	119	119
31 May 24	108	108	108
Average	112	112	112
Min	99	99	99
Max	119	119	119



TABLE F5.4 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.4X (CELL 4X))

Date	Meter No.X7 (cm)	Meter No.X8 (cm)	Average (cm)
Pump Station No.	4X (Cell 4X)		
1 May 24	121	119	120
2 May 24	122	120	121
3 May 24	116	114	115
4 May 24	142	133	138
5 May 24	130	126	128
6 May 24	118	118	118
7 May 24	118	116	117
8 May 24	100	100	100
9 May 24	109	109	109
10 May 24	117	109	113
11 May 24	107	105	106
12 May 24	112	110	111
13 May 24	116	114	115
14 May 24	103	103	103
15 May 24	114	116	115
16 May 24	122	120	121
17 May 24	109	109	109
18 May 24	116	116	116
19 May 24	120	120	120
20 May 24	109	109	109
21 May 24	118	118	118
22 May 24	105	105	105
23 May 24	116	116	116
24 May 24	103	100	102
25 May 24	120	120	120
26 May 24	119	119	119
27 May 24	118	118	118
28 May 24	120	120	120
29 May 24	118	109	114
30 May 24	103	100	102
31 May 24	109	109	109
Average	115	114	114
Min	100	100	100
Max	142	133	138



CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169



EFFLUENT QUALITY MONITORING RESULTS

TABLE F6.1 EFFLUENT MONITORING RESULTS

Date		9 May 24			
On-site Measurements					
Temperature	°C	34.3			
pH Value	pH Unit	8.3			
Volume Discharged	m³	1365			
Laboratory Analysis					
Suspended Solids (SS)	mg/L	23			
Alkalinity	mg/L	1120			
Ammoniacal-nitrogen	mg/L	0.25			
Chloride	mg/L	1520			
Nitrite-nitrogen	mg/L	0.11			
Phosphate	mg/L	5.22			
Sulphate	mg/L	224			
Total Nitrogen	mg/L	74.6			
Nitrate-nitrogen	mg/L	35.7			
Total Inorganic Nitrogen	mg/L	36.06			
Biochemical Oxygen Demand (BOD)	mg/L	10			
Chemical Oxygen Demand (COD)	mg/L	791			
Oil & Grease	mg/L	<5			
Total Organic Carbon (TOC)	mg/L	251			
Boron	μg/L	3820			
Calcium	mg/L	17.7			
Iron	mg/L	1.26			
Magnesium	mg/L	27.4			
Potassium	mg/L	592			
Cadmium	μg/L	<1.0			
Chromium	μg/L	85			
Copper	μg/L	<10			
Nickel	μg/L	85			
Zinc	μg/L	63			





CALIBRATION CERTIFICATES FOR GROUNDWATER MONITORING EQUIPMENT



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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR IVAN LEUNG WORK ORDER: HK2410348

CLIENT: ALS TECHNICHEM (HK) PTY LTD

ADDRESS: 11/F., CHUNG SHUN KNITTING CENTRE, **SUB-BATCH:** (

1-3 WING YIP STREET, KWAI CHUNG, N.T. LABORATORY: HONG KONG

DATE RECEIVED: 15-Mar-2024 **DATE OF ISSUE:** 20-Mar-2024

GENERAL COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

This report superseded any previous report(s) with same work order number.

EQUIPMENT INFORMATION

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.

Equipment Type: Multifunctional Meter Service Nature: Performance Check

Scope: Conductivity, Dissolved Oxygen, pH Value, Turbidity, Salinity and Temperature

Brand Name/ Model No.: [HORIBA]/ [U-52G]
Serial No./ Equipment No.: [AWE7D2V4]/ [N/A]
Date of Calibration: 19-March-2024

16:5

Ms. Lin Wai Yu, Iris

Assistant Manager - Inorganics

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WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/ Model No.:

[HORIBA]/[U-52G]

Serial No./

Equipment No.:

[AWE7D2V4]/[N/A]

Date of Calibration:

19-March-2024

Date of Next Calibration:

19-June-2024

PARAMETERS:

Conductivity Method Ref: APHA (23rd edition), 2510B

Expected Reading (µS/cm)	Displayed Reading (μS/cm)	Tolerance (%)
146.9	151	+2.8
6667	6520	-2.2
12890	12500	-3.0
58670	53500	-8.8
	Tolerance Limit (%)	±10.0

Dissolved Oxygen

Method Ref: APHA (23rd edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.28	2.26	-0.02
5.88	5.82	-0.06
7.30	7.36	+0.06
	Tolerance Limit (mg/L)	±0.20

pH Value

Method Ref: APHA (23rd edition), 4500H: B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)		
4.0	3.92	-0.08		
7.0	6.95	-0.05		
10.0	10.03	+0.03		
	Tolerance Limit (pH unit)	±0.20		

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

Ms. Lin Wai Yu, Iris

WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/ Model No.:

[HORIBA]/[U-52G]

Serial No./

[AWE7D2V4]/ [N/A]

Equipment No.: Date of Calibration:

[, ..._, __ . .], [. ., . .]

19-March-2024

Date of Next Calibration: 19-June-2024

PARAMETERS:

Turbidity Method Ref: APHA (23rd edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.0	
4	4.3	+7.5
40	38.0	-5.0
80	79.8	-0.3
400	376	-6.0
800	769	-3.9
	Tolerance Limit (%)	±10.0

Salinity Method Ref: APHA (23rd edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.01	
10	9.34	-6.6
20	18.40	-8.0
30	27.47	-8.4
	Tolerance Limit (%)	±10.0

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

Ms. Lin Wai Yu, Iris

WORK ORDER: HK2410348

SUB-BATCH: 0

DATE OF ISSUE: 20-Mar-2024

CLIENT: ALS TECHNICHEM (HK) PTY LTD

Equipment Type:

Multifunctional Meter

Brand Name/

[HORIBA]/[U-52G]

Model No.: Serial No./

Equipment No.:

[AWE7D2V4]/ [N/A]

Date of Calibration:

19-March-2024

Date of Next Calibration:

19-June-2024

PARAMETERS:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical

Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	10.61	+1.6
25.0	25.63	+0.6
44.0	43.62	-0.4
	Tolerance Limit (°C)	±2.0

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

Ms. Lin Wai Yu, Iris



ANNEX F8 GROUNDWATER MONITORING RESULTS

TABLE F8.1 GROUNDWATER MONITORING RESULTS

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14 ^(a)
Water Level	mPD	2.97	2.97	2.92	3.13	2.42	2.69	2.58	2.82	3.61	3.26	3.5	6.8	36.9	N/A
Bicarbonate Alkalinity as CaCO3	mg/L	168	208	233	186	<1	<1	84	<1	157	207	232	58	14	N/A
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	53	117	10	73	<1	<1	<1	<1	<1	N/A
Total Alkalinity as CaCO3	mg/L	168	208	233	186	79	184	94	112	157	207	232	58	14	N/A
pH Value	pH Unit	7.6	7.9	7.7	8	10.5	11.3	8.6	10.7	7.9	7.7	8	6.7	5.6	N/A
Electrical Conductivity	μS/cm	1540	4820	780	899	1740	1270	2160	3650	1120	1110	697	302	93	N/A
Ammonia	mg/L	0.29	1.05	0.05	0.09	6.59	3.92	4.66	14.5	0.02	0.01	0.03	0.04	0.03	N/A
Chloride	mg/L	346	1380	56	96	428	198	618	1070	145	150	45	20	14	N/A
Nitrite	mg/L	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	N/A
Phosphorus	mg/L	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.03	<0.01	0.02	0.02	<0.01	0.02	0.01	N/A
Sulphate	mg/L	75	262	84	129	129	89	45	40	224	117	67	60	3	N/A
Sulphide	mg/L	<0.1	<0.1	<0.1	<0.1	5.5	7.3	1.6	10.9	<0.1	<0.1	<0.1	<0.1	<0.1	N/A
Total Kjeldahl Nitrogen	mg/L	0.4	1	0.3	0.4	9.3	4.4	5.9	15.4	0.4	0.2	0.2	0.1	0.1	N/A
Nitrate	mg/L	0.01	0.17	0.32	0.04	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.24	0.04	0.12	N/A
Total Nitrogen	mg/L	220	700	160	170	220	160	690	500	260	280	100	0.2	0.2	N/A
Boron	μg/L	68.9	84.1	92.8	98.6	35.1	38.1	22.9	88	113	90.9	88.6	20	10	N/A
Calcium	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	24.8	0.82	N/A
Mercury	μg/L	14.2	85.3	6.27	6.74	0.41	<0.05	11.3	0.14	5.64	8.9	5.6	<0.20	<0.20	N/A
Magnesium	mg/L	193	734	47.8	65.2	248	152	342	585	99.4	120	46.2	4	0.95	N/A



Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14 ^(a)
Sodium	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	24.2	13	N/A
Iron	mg/L	24.2	42.8	18	17.3	63.7	56.8	40.5	61.9	20.1	15.6	8.51	<0.04	<0.04	N/A
Potassium	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.3	3.77	N/A
Cadmium	μg/L	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	N/A
Chromium	μg/L	<1	<1	3	2	<1	<1	<1	<1	4	2	2	<1	<1	N/A
Copper	μg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	4	N/A
Lead	μg/L	1660	242	52	12	<1	<1	4	<1	4	984	300	<1	<1	N/A
Manganese	μg/L	<1	<1	<1	<1	2	2	<1	<1	<1	<1	<1	620	16	N/A
Nickel	μg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1	<1	N/A
Zinc	μg/L	220	700	160	170	220	160	690	500	260	280	100	16	306	N/A
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	7	<2	13	<2	<2	<2	<2	<2	N/A
Chemical Oxygen Demand	mg/L	11	21	14	15	42	47	12	49	22	10	7	3	3	N/A
Total Organic Carbon	mg/L	3	3	5	6	9	8	2	8	8	3	4	1	1	N/A

Note:

(a) MWX-14 is not accessible due to safety considerations.





INVESTIGATION REPORTS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCE

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	6 May 2024
Time	DP3: 09:48
	DP6: 10:13
	DP6 (Duplicate): 10:18
Monitoring Location	DP3 and DP6
Parameter	Surface Water (Ammoniacal-nitrogen and Suspended Solids (SS))
Limit Level	DP3: Ammoniacal-nitrogen: >0.5 mg /L
	DP6: SS: >20 mg /L
Measured Level	DP3: Ammoniacal-nitrogen: 1.38 mg /L
	DP6: SS: 22.0 mg /L
	DP6 (Duplicate): SS: 26.3 mg /L
Possible reason	From the on-site rainfall record of May 2024, heavy rainfall events were recorded on 4 May 2024 before the sampling event. Red and amber rainstorm warning signal were also issued by the Hong Kong Observatory on 4 May 2024.
	No works which may lead to potential increase in ammoniacal- nitrogen level (e.g. potential leakage of leachate) and SS increase (e.g. active stockpiling and excavation works) were conducted in the vicinity of surface water channel leading to DP3 and DP6, respectively, on the sampling day based on on-site observations and construction activities described by the Contractor.
	During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP3 and DP6 which might cause the ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6. Site surface runoff at DP3 and DP6 channel was treated by the Wetsep prior to discharge. The contaminated runoff from the unpaved areas during the previous rainfall events could be the potential source of ammoniacal-nitrogen and SS contributing to the exceedance. The ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6 were therefore deemed to Project-related activities.
	In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 30 May 2024 to confirm findings. Surface water samples with ammoniacal-nitrogen concentration of 0.18 mg/L and 0.16 mg/L (below the Limit Level) were sampled at DP3, which demonstrate no consecutive surface water quality impact at the monitoring location. SS concentration of 34.3 mg/L was measured at DP6 during the sampling event. DP6 showed consecutive exceedance of surface water quality (SS) limit.

Action Taken / Action to be Taken

In accordance with Table 4.5b of the updated EM&A Manual, the monitoring frequency shall be increased to weekly until no exceedance of Limit Level. It should be noted that the turnaround time for the laboratory analysis of the surface water sample is 5 working days and the preliminary results for the monitoring event conducted on 6 May 2024 were available on 13 May 2024. Repeat measurement was conducted on 16 May (unable to collect water sample due to insufficient flow) and 30 May 2024, and the ammoniacal-nitrogen results at DP3 are well below the Limit Level. Hence, the weekly surface water monitoring at DP3 shall not be triggered. While the surface water monitoring frequency (for SS) at DP6 shall be increased to weekly in accordance with Table 4.5b of the updated EM&A Manual until no exceedance of Limit Level.

Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels.

In addition, the Contractor shall review the efficiency of the Wetsep at DP3 and DP6 and monitor the Wetsep operation regularly to ensure they are functioning properly at all times.

Remarks

Prepared by: Abbey Lau

Designation: Environmental Team

Date: 6 June 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	30 May 2024
Time	14:27
Monitoring Location	DP6
Parameter	Suspended Solids (SS))
Limit Level	>20 mg /L
Measured Level	34.3 mg /L
Possible reason	From the on-site rainfall record of May 2024, heavy rainfall event was recorded on 27 May 2024 before the sampling event. Amber rainstorm warning signal was also issued by the Hong Kong Observatory on 27 and 28 May 2024. No works which may lead to potential increase in SS increase (e.g. active stockpiling and excavation works) was conducted in the vicinity of surface water channel leading to DP6 on the sampling day based on on-site observations and construction activities described by the Contractor. During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP6 which might cause the SS exceedance at DP6. Site surface runoff at DP6 channel was treated by the Wetsep prior to discharge. The contaminated runoff from the unpaved areas during the previous rainfall events could be the
Action Taken / Action to	potential source of SS contributing to the exceedance. The SS exceedance at DP6 was therefore deemed to Project-related activities. Weekly surface water quality monitoring (SS) shall be continued at
be Taken	DP6 until no exceedance of Limit Level in accordance with Table 4.5b of the updated EM&A Manual.
	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels.
	In addition, the Contractor shall review the efficiency of the Wetsep at DP6 and monitor the Wetsep operation regularly to ensure it is functioning properly at all times.
Remarks	-
Prepared by: Abbey Lau	·

Prepared by: Abbey Lau

Designation: Environmental Team

Date: 18 June 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	3 May 2024
Time	MWX-5: 11:24
	MWX-6: 11:10
Monitoring Location	MWX-5, MWX-6
Parameter	MWX-5: Ammoniacal-nitrogen and Chemical Oxygen Demand (COD)
	MWX-6: COD
Limit Level	Ammoniacal-nitrogen: MWX-5: >5 mg /L
	COD: MWX-5: >30 mg /L
	MWX-6: >46 mg /L
Measured Level	Ammoniacal-nitrogen: MWX-5: 6.59 mg /L
	COD: MWX-5: 42 mg /L
	MWX-6: 47 mg /L
Possible reason	Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring well MWX-6 (3.92 mg/L) and at groundwater monitoring wells adjacent to MWX-5 (MWX-4: 0.09 mg/L) are well within the respective limit levels. The COD monitoring results of the groundwater monitoring wells adjacent to MWX-5 and MWX-6 (MWX-4: 15 mg/L, MWX-7: 12 mg/L) are well within the respective limit levels. Hence, there are a low possibility of the elevation of ammoniacal-nitrogen level at MWX-5 and the elevation of COD level at MWX-5 and MWX-6 are due to leachate contamination from SENTX operation or at least they are not conclusive to base on these results to demonstrate exceedances were due to leachate contamination.
	In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 12 June 2024 to confirm findings. Ammoniacal-nitrogen concentration of 0.19 mg/L (below the Limit Level) was measured at MWX-5 and COD concentration of 13 mg/L and 45 mg/L (below the Limit Level) were measured at MWX-5 and MWX-6, respectively, during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring locations.
	According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated ammoniacal-nitrogen and COD concentration measured at MWX-5 and elevated COD concentration measured at MWX-6 on 3

May 2024 could be due to localised organic matters within or around the monitoring wells and background fluctuation. Due to the presence of influencing factor from non-project source, there is no adequate evidence showing that the ammoniacal-nitrogen and COD level exceedances measured at MWX-5 and COD level exceedance measured at MWX-6 on 3 May 2024 were deemed to Project-related activities. It should also be noted that although the COD level exceeded the limit level of the EM&A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of ammoniacalnitrogen and COD at MWX-5 and COD at MWX-6 on 3 May 2024 will not cause adverse water quality impact to the Junk Bay Water Control Zone. Action Taken / Action Examination of environmental performance of the Project will be to be Taken continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels.

ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.

Remarks

Prepared by: Abbey Lau

Designation:

Environmental Team

Date:

5 July 2024



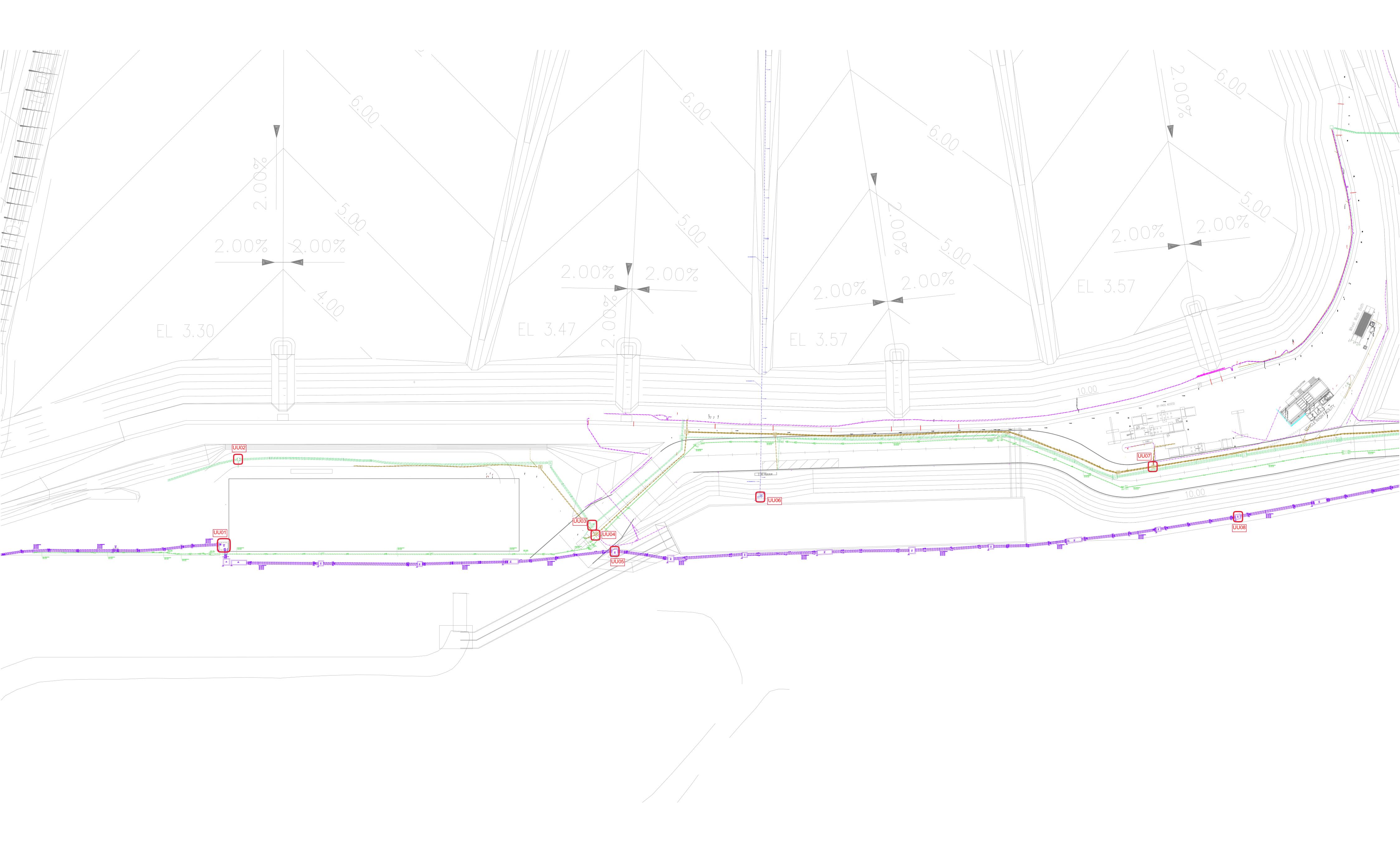
ANNEX G

LANDFILL GAS



ANNEX G1

LANDFILL GAS MONITORING
LOCATIONS FOR SERVICE VOIDS,
UTILITIES AND MANHOLES ALONG THE
SITE BOUNDARY AND WITHIN THE
SENTX SITE







ANNEX G2

CALIBRATION CERTIFICATES FOR LANDFILL GAS MONITORING EQUIPMENT



ALS Technichem (HK) Pty Ltd

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Kwai Chung, N.T., Hong Kong

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CERTIFICATE OF ANALYSIS

CONTACT: MR IVAN LEUNG WORK ORDER: HK2415013

CLIENT: ALS TECHNICHEM (HK) PTY LTD

ADDRESS: 11/F., CHUNG SHUN KNITTING CENTRE, **SUB BATCH:** 0

1-3 WING YIP STREET, KWAI CHUNG, N.T. LABORATORY: HONG KONG

DATE RECEIVED: 18-Apr-2024 **DATE OF ISSUE:** 30-Apr-2024

SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client. The performance of the equipment stated in this report is checked with independent reference material and results are compared against a calibrated secondary source.

The "Instrument Specification" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principles as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type: Landfill Gas Analyser Service Nature: Performance Check

Scope: Carbon dioxide, Methane and Oxygen

Brand Name/ Model No.: GA5000

Serial No./Equipment No.: G508090 (HK2096)
Date of Calibration: 30 April, 2024

GENERAL COMMENTS

This report superseded any previous report(s) with same work order number.

Ms Chan Ka Yu, Karen Manager - Organics

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Work Order: HK2415013

Sub-Batch: 0

Client: ALS TECHNICHEM (HK) PTY LTD

Date of Issue: 30-Apr-2024

Equipment Type: Landfill Gas Analyser

Brand Name/ Model No.:

GA5000

Serial No./

G508090 (HK2096)

Equipment No.:

Date of Calibration: 30 April, 2024

Next Calibration Date: 30 May, 2024

Parameters:

Methane

Calibrated Gas Standard, %	Monitor Readout, %	% error	Instrument Specification, %
0.0 (Nitrogen)	0.0	0.0	± 0.5
1.0	1.0	0.0	± 0.5
10.0	10.0	0.0	± 0.5

Carbon Dioxide

Calibrated Gas Standard, %	Monitor Readout, %	% error	Instrument Specification, %
0.0 (Nitrogen)	0.0	0.0	± 0.5
1.0	1.2	0.2	± 0.5
10.1	10.4	0.3	± 0.5

Oxygen

Calibrated Gas Standard, %	Monitor Readout, %	% error	Instrument Specification, %
0.0 (Nitrogen)	0.0	0.0	± 1.0
23.3	23.6	0.3	± 1.0

Ms Chan Ka Yu, Karen Manager - Organics

PROMAT (HK) LTD

寶時(香港)有限公司

901 New Trend Centre, 704 Prince Edward Road East, San Po Kong, Kowloon, Hong Kong Tel: (852)2661 2392 Fax: (852)2661 2086 Email: service@promat.hk http://www.promat.hk



Calibration Certificate

Customer Name

Als Technichem (HK) Pty Ltd

Model

Gasurveyor 512-Leak

Serial

554846

Tested On

09 August 2023

Cal Expires

08 August 2024

Calibrated For

METHANE

100% LEL Equivalent

4.4% by VOL

Leak Test

PASS

Overall Results

PASS

Calibration Result

Gas Applied	Range	Reading	Calibrated	Result
Zero Air	% LEL	-0.2	0.0	PASS
Zero Air	% GAS	0.0	0.0	PASS
Zero Air	Semi-Int	0.0	-4	PASS

Gas Applied	Range	Reading	Calibrated	Result
30 PPM Methane	Semi-Int	87	28	PASS
50% LEL Methane	% LEL	57.2	50.0	PASS
99% VOL Methane	% GAS	102.0	98.9	PASS

Calibrated By:



ANNEX G3 LANDFILL GAS MONITORING RESULTS

TABLE G3.1 LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS

LFG1 3.39 LFG2 3.38 LFG3 3.28 LFG4 2.77 LFG5 3.26 LFG6 3.05 LFG7 3.66 LFG8 4.26 LFG9 3.34	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	0.6 0.7 3.8 1.7 0.3 0.4 0.1 0.1 0.1 0.2	14.2 20.9 6.4 3.6 1.7 19.4 18.8 20.0 16.9 9.2
LFG3 3.28 LFG4 2.77 LFG5 3.26 LFG6 3.05 LFG7 3.66 LFG8 4.26	0.1 0.1 0.1 0.1 0.1 0.1 0.9 1.3	3.8 1.7 0.3 0.4 0.1 0.1 0.1 0.2	6.4 3.6 1.7 19.4 18.8 20.0 16.9
LFG4 2.77 LFG5 3.26 LFG6 3.05 LFG7 3.66 LFG8 4.26	0.1 0.1 0.1 0.1 0.1 0.9 1.3	1.7 0.3 0.4 0.1 0.1 0.1 0.2	3.6 1.7 19.4 18.8 20.0 16.9
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	0.1 0.1 0.1 0.1 0.9 1.3	0.3 0.4 0.1 0.1 0.1 0.2	1.7 19.4 18.8 20.0 16.9
LFG6 3.05 LFG7 3.66 LFG8 4.26	0.1 0.1 0.1 0.9 1.3 0.1	0.4 0.1 0.1 0.1 0.2	19.4 18.8 20.0 16.9
LFG7 3.66 LFG8 4.26	0.1 0.1 0.9 1.3	0.1 0.1 0.1 0.2	18.8 20.0 16.9
LFG8 4.26	0.1 0.9 1.3 0.1	0.1 0.1 0.2	20.0
	0.9 1.3 0.1	0.1	16.9
LFG9 3.34	1.3 0.1	0.2	
	0.1		9.2
LFG10 3.31			- · -
LFG11 3.67		0.0	20.0
LFG12 3.27	0.3	0.0	20.1
LFG13 2.90	0.1	0.0	20.7
LFG14 2.79	0.3	0.0	20.5
LFG15 2.93	10.8	0.1	9.2
LFG16 3.74	0.1	0.1	20.2
LFG17 2.96	10.8	0.3	1.2
LFG18 3.97	0.1	0.1	20.4
LFG19 4.89	0.1	0.1	20.4
LFG20 ^(a) N/A	N/A	N/A	N/A
LFG21 4.46	0.0	0.1	20.3
LFG22 4.4	0.0	0.1	20.3
LFG23 23.25	0.0	0.1	20.1
LFG24 6.32	0.0	0.1	20.1
GP1 Probe Bent	0.0	7.6	9.6
GP2 (shallow) Probe Bent	0.0	1.1	18.0
GP2 (deep) Probe Bent	0.0	0.2	19.9
GP3 (shallow) Probe Bent	0.0	0.1	20.1
GP3 (deep) Probe Bent	0.0	1.3	19.0
GP4 (shallow) Probe Bent	0.0	1.0	19.5
GP4 (deep) Probe Bent	0.0	4.2	15.3
GP5 (shallow) Probe Bent	0.0	5.5	14.1
GP5 (deep) 39.94	0.0	0.1	20.0
GP6 40.06	0.0	5.6	15.2



CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
GP7	36.7	0.0	0.1	20.0
GP12	2.68	0.1	0.2	19.9
GP15	3.11	0.1	0.0	20.1
P7	3.1	0.1	0.0	20.1
P8	3.33	0.1	0.2	20.9
P9	3.22	0.1	0.4	19.3

Note:

(a) The Monitoring well LFG20 was under maintenance.

TABLE G3.2 LANDFILL GAS MONITORING AT SERVICE VOIDS, UTILITIES PITS AND MANHOLE

Location	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
UU01	0.0	0.1	20.3
UU02	0.0	0.1	20.1
UU03	0.0	0.1	19.7
UU04	0.0	0.1	19.6
UU05	0.0	0.1	18.1
UU06	0.0	0.1	18.0
UU07	0.0	0.1	19.5
UU08	0.0	0.1	17.8
UU09	0.0	0.1	17.7
UU10	0.0	0.1	17.7
UU11	0.0	0.1	17.8
UU12	Voided due to lat	est site programme and on	-going operation work
UU13	0.0	0.1	17.8
UU14	0.0	0.1	17.8
UU15	0.0	0.1	17.8
UU16	0.0	0.1	18.1
UU17	Voided due to lat	est site programme and on	-going operation work
UU18	Voided due to lat	est site programme and on	-going operation work
UU19	Voided due to lat	est site programme and on	-going operation work
UU20	0.0	0.1	18.2
UU21	0.0	0.0	18.2
UU22	0.0	0.0	18.4
UU23	0.0	0.0	18.4
UU24	0.0	0.0	18.4
UU25	0.0	0.0	18.4
UU26	0.0	0.0	18.6



Location	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
UU27	0.0	0.0	18.7
UU28	0.0	0.0	18.7

TABLE G3.3 LANDFILL GAS BULK GAS SAMPLING MONITORING RESULTS

Parameters	LFG2	LFG8
Methane (% (v/v))	<0.020	<0.020
Carbon Dioxide (% (v/v))	0.624	0.089
Oxygen (% (v/v))	17.2	20.4
Nitrogen (% (v/v))	79.5	76.9
Carbon Monoxide (% (v/v))	<0.020	<0.020
Hydrogen (% (v/v))	<0.020	<0.020
Ethane (ppmv)	<1.0	<1.0
Propane (ppmv)	<1.0	<1.0
Butane (ppmv)	<1.0	<1.0

TABLE G3.4 FLAMMABLE GAS SURFACE EMISSION MONITORING RESULTS

Time	GPS Coordinates Latitude (N)	Longitude (E)	Weather Condition	Temperature (°C)	Wind Direction (Deg)	Wind Speed (m/s)	Monitoring Results (ppm)
15:18	22º16′34″	114º16′38″	Sunny	28.8	095	1.5	13
15:43	22°16′24″	114°16′26″	Sunny	28.2	220	3.3	16
15:55	22°16′31″	114°16′27″	Sunny	28.4	192	4.0	11



CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169



ANNEX G4

EVENT AND ACTION PLAN FOR LANDFILL GAS MONITORING

ANNEX G4 EVENT AND ACTION PLAN FOR LANDFILL GAS MONITORING

		Action	
Event	ET	IEC	Contractor
Limit Level being exceeded for field monitoring at the perimeter monitoring wells	 Investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Check monitoring data, all plant, equipment and the Contractor's working methods Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Increase the monitoring frequency to daily if exceedance is due to the Project for monitoring wells in the areas where there is development within 250m of the SENTX Site Boundary and to weekly for other monitoring wells, until no exceedance of limit level 	 Verify the Notification of Exceedance Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Repeat field measurement to confirm findings Check the performance of landfill gas management system Rectify unacceptable practice Discuss with the ET and IEC and submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate
Limit Level being exceeded for the bulk gas sampling at the perimeter monitoring wells	 Check and compare the results of field monitoring and laboratory analyse of bulk samples If the results of field monitoring also show exceedance, the action(s) for limit level being exceeded for field monitoring would have been triggered If the results of field monitoring does not show exceedance, the sampling 	Verify the findings by ET	• Nil



		Action	
Event	ET	IEC	Contractor
	procedures should be checked and if deems necessary, to repeat the monitoring and recalibrate the portable monitoring instruments Notify the above findings to Contractor and IEC		
Limit Level being exceeded at the permanent gas monitoring system	 Investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Check the methane gas level at the perimeter monitoring wells, manholes or utilities duct Check monitoring data, all plant, equipment and the Contractor's working methods Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented 	 Verify the Notification of Exceedance Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Evacuate all staff in the concerned building Open the doors and window of all rooms on the ground floor Do not allow staff to go back to the room if methane level is higher than 1% gas Check the performance of the landfill gas management system Rectify unacceptable practice Consider changes of working methods Discuss with the ET and IEC and submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate
Limit Level being exceeded during surface emission monitoring	 Repeat the measurement to confirm findings Investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Check monitoring data, all plant, equipment and the Contractor's working methods 	 Verify the Notification of Exceedance Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures 	 Check landfill gas management system Rectify unacceptable practice Consider changes of working methods Discuss with the ET and IEC and submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate



		Action	
Event	ET	IEC	Contractor
	 Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Increase the monitoring frequency to monthly if exceedance is due to the Project until no exceedance of limit level 		
Limit Level being exceeded at the service voids, utilities pits, manholes and location of vegetation stress	 Repeat the measurement to confirm findings Investigate the cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Check monitoring data, all plant, equipment and the Contractor's working methods Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Increase the monitoring frequency to weekly if exceedance is due to the Project until no exceedance of limit level 	 Verify the Notification of Exceedance Discuss with ET and Contractor on proposed remedial measures Review proposals on remedial measures Audit the implementation of the remedial measures the effectiveness of the implemented remedial measures 	 Check landfill gas management system Rectify unacceptable practice Discuss with the ET and IEC and submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate





ANNEX H

CUMULATIVE STATISTICS ON EXCEEDANCES, ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND STATUS OF PROSECUTIONS

TABLE H1 CUMULATIVE STATISTICS ON EXCEEDANCES

		Total No. recorded in this reporting period	Total No. recorded since project commencement
Air Quality (Dust)	Action	0	0
	Limit	0	21
Air Quality (Odour)	Action	0	0
	Limit	0	0
Air Quality (Emissions of Thermal Oxidiser)	Limit	0	4
Air Quality (Emissions of Landfill Gas Flare)	Limit	1	8
Air Quality (Emissions of Landfill Gas Generator)	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Water Quality (Surface Water)	Limit	2	63
Water Quality (Leachate)	Limit	0	1
Water Quality (Leachate Level)	Limit	0	194
Water Quality (Groundwater)	Limit	3	27
Landfill Gas (Perimeter Landfill Gas Monitoring Wells)	Limit	0	4
Landfill Gas (Service Void, Utilities and Manholes)	Limit	0	0
Landfill Gas (Permanent Gas Monitoring System)	Limit	0	0

TABLE H2 CUMULATIVE STATISTICS ON COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

Reporting Period	Cumulative Statistics					
	Complaints	Notifications of Summons	Prosecutions			
This Reporting Period (1 – 31 May 2024)	0	0	0			
Total no. received since project commencement	1	0	0			

CLIENT: Green Valley Landfill Ltd. PROJECT NO: 0465169



ANNEX I

MONITORING SCHEDULE FOR THE NEXT REPORTING PERIOD

South East New Territories (SENT) Landfill Extension EM&A Impact Monitoring Schedule during Operation/ Restoration Phase

June 2024

June 2024					T	
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	Perimeter LFG Monitoring Service voids LFG Monitoring Noise Monitoring	4	Additional Surface Water Monitoring	Dust Monitoring	7	8
9	10	11	Dust Monitoring Surface Water Monitoring Groundwater Monitoring	Leachate Monitoring Noise Monitoring	14	15
16	Stack Monitoring	Dust Monitoring Stack Monitoring Odour Monitoring	Noise Monitoring	20	21	22
23	Dust Monitoring	Noise Monitoring	26	27	28	29
Dust Monitoring						



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