



翠谷工程有限公司
Green Valley Landfill, Limited

South East New Territories (SENT) Landfill Extension

Monthly Environmental Monitoring & Audit Report No.10
for October 2019

April 2020

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Green Valley Landfill, Limited

South East New Territories (SENT) Landfill Extension

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


Reference Document/Plan

| | |
|---|---|
| Document/Plan to be Certified/Verified: | Monthly Environmental Monitoring & Audit Report No.10 for October 2019 for South East New Territories (SENT) Landfill Extension |
| Date of Report: | 28 April 2020 |


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/B and FEP-01/308/2008/B. | |
| Frank Wan, Environmental Team Leader: (ERM Hong-Kong, Limited) |  Date: 28 April 2020 |

IEC Verification




| | |
|--|---|
| I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-308/2008/B and FEP-01/308/2008/B. | |
| W.K. Chiu, Independent Environmental Checker: (Meinhardt Infrastructure and Environment Limited) |  Date: 4 May 2020 |

South East New Territories (SENT) Landfill Extension

Monthly Environmental Monitoring & Audit Report for October 2019

Environmental Resources Management

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| | | | | | |
|---|--|--|---------|----------|-----------|
| Client: Green Valley Landfill Ltd. | | Project No: 0465169 | | | |
| Summary: This document presents the Monthly EM&A Report No.10 for October 2019 for <i>South East New Territories (SENT) Landfill Extension</i> | | Date: 28 April 2020 | | | |
| | | Approved by:  Frank Wan <i>Partner</i> | | | |
| | | | | | |
| 1 | Monthly EM&A Report No.10 (for October 2019) (Annex G revised) | AL | FW | FW | 28 Apr 20 |
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| Revision | Description | By | Checked | Approved | Date |
| <p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p> | | <p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p> <div style="text-align: right;">   </div> | | | |

CONTENTS

| | | |
|----------|--|-----------|
| | EXECUTIVE SUMMARY | 1 |
| 1 | INTRODUCTION | 1 |
| 1.1 | BACKGROUND | 1 |
| 1.2 | PROJECT DESCRIPTION | 1 |
| 1.3 | SCOPE OF THE EM&A REPORT | 2 |
| 1.4 | PROJECT ORGANISATION | 2 |
| 1.5 | SUMMARY OF CONSTRUCTION WORKS | 3 |
| 1.6 | SUMMARY OF EM&A PROGRAMME REQUIREMENTS | 4 |
| 1.7 | STATUS OF STATUTORY ENVIRONMENTAL COMPLIANCE WITH THE ENVIRONMENTAL PERMIT | 5 |
| 1.8 | STATUS OF OTHER STATUTORY ENVIRONMENTAL REQUIREMENTS | 5 |
| 2 | EM&A RESULTS | 7 |
| 2.1 | AIR QUALITY MONITORING | 7 |
| 2.2 | NOISE MONITORING | 9 |
| 2.3 | SURFACE WATER QUALITY MONITORING | 10 |
| 2.4 | LANDSCAPE AND VISUAL MONITORING | 12 |
| 2.5 | EM&A SITE INSPECTION | 12 |
| 2.6 | WASTE MANAGEMENT STATUS | 14 |
| 2.7 | IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES | 15 |
| 2.8 | SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT | 15 |
| 2.9 | SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS | 15 |
| 3 | FUTURE KEY ISSUES | 16 |
| 3.1 | CONSTRUCTION PROGRAMME FOR THE COMING MONTH | 16 |
| 3.2 | KEY ISSUES FOR THE COMING MONTH | 16 |
| 3.3 | MONITORING SCHEDULE FOR THE COMING MONTH | 17 |
| 4 | CONCLUSION AND RECOMMENDATION | 18 |

ANNEXES

ANNEX A WORK PROGRAMME

ANNEX B ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

ANNEX C MONITORING SCHEDULE FOR THIS REPORTING PERIOD

ANNEX D AIR QUALITY

ANNEX D1 CALIBRATION CERTIFICATES FOR DUST MONITORING EQUIPMENT

ANNEX D2 24-HOUR TSP MONITORING RESULTS

ANNEX D3 EVENT AND ACTION PLAN FOR DUST MONITORING

ANNEX D4 METEOROLOGICAL DATA

ANNEX E NOISE

ANNEX E1 CALIBRATION CERTIFICATES FOR NOISE MONITORING EQUIPMENT

ANNEX E2 NOISE MONITORING RESULTS

ANNEX E3 EVENT AND ACTION PLAN FOR NOISE MONITORING

ANNEX F SURFACE WATER QUALITY

*ANNEX F1 CALIBRATION CERTIFICATES FOR SURFACE WATER QUALITY
MONITORING EQUIPMENT*

ANNEX F2 SURFACE WATER QUALITY MONITORING RESULTS

*ANNEX F3 EVENT AND ACTION PLAN FOR SURFACE WATER QUALITY
MONITORING*

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

ANNEX H MONITORING SCHEDULE FOR THE NEXT REPORTING PERIOD

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) of the Project commenced on 2 January 2019.

This Monthly EM&A report presents the EM&A works carried out during the period from 1 to 31 October 2019 for the Project in accordance with the updated EM&A Manual.

Exceedance of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Levels for construction air quality monitoring was recorded in the reporting period.

Exceedance of Action and Limit Levels for Noise

No exceedance of Action and Limit Levels for construction noise monitoring was recorded in the reporting period.

Exceedance of Action and Limit Levels for Surface Water Quality

No exceedance of Action and Limit Levels for surface water quality impact 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 activities in the next reporting period of November 2019 are mainly associated with dust emission from the exposed area and loading and unloading operation of dusty materials.

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).

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 of the Project commenced on 2 January 2019.

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

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

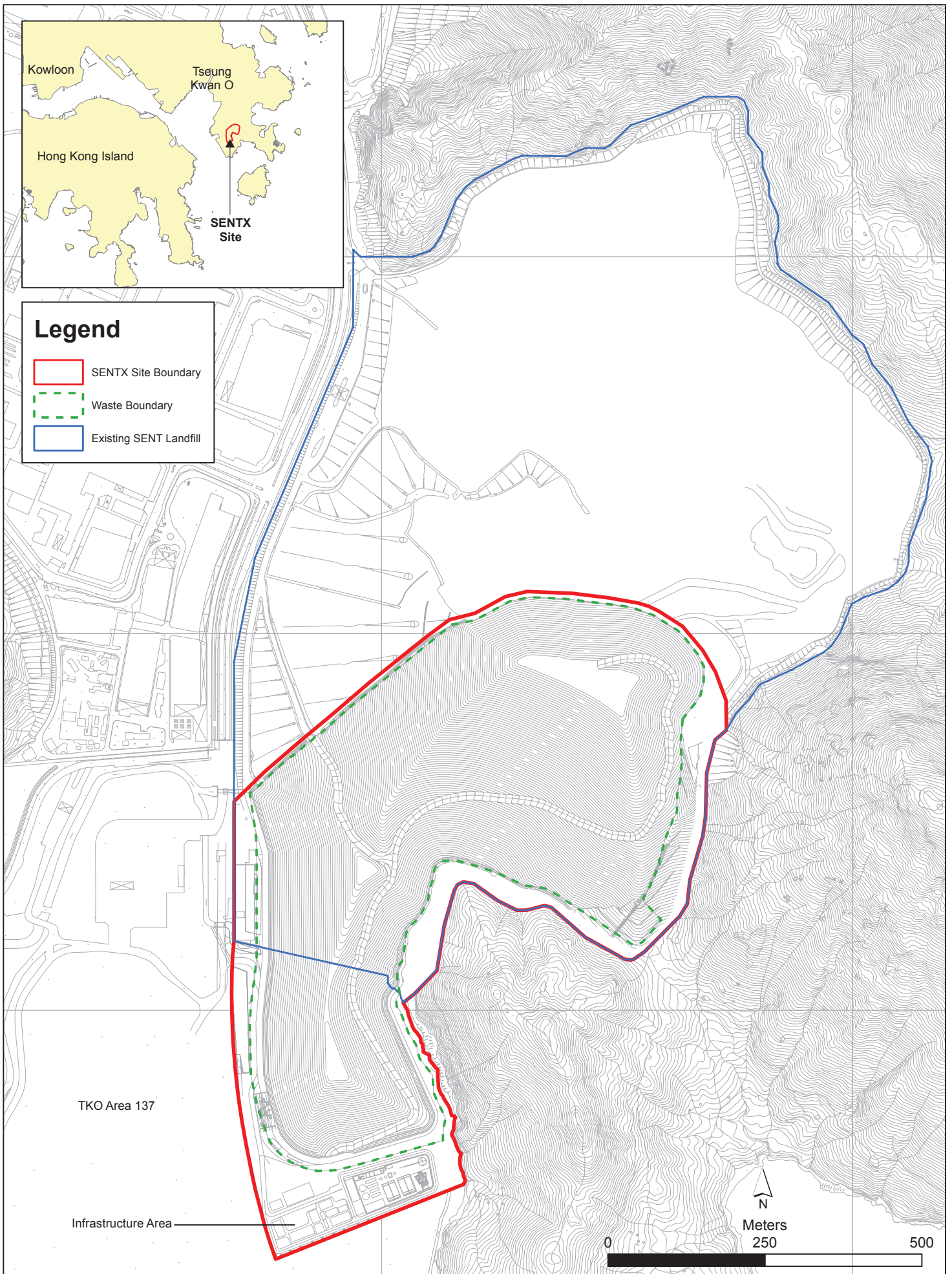


Figure 1.1

Layout Plan of SENTX

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 | 2021 or upon exhaustion of SENT Landfill |
| Estimated exhaustion date of SENTX | 2027 |
| End of aftercare for SENTX | 2057 |

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.

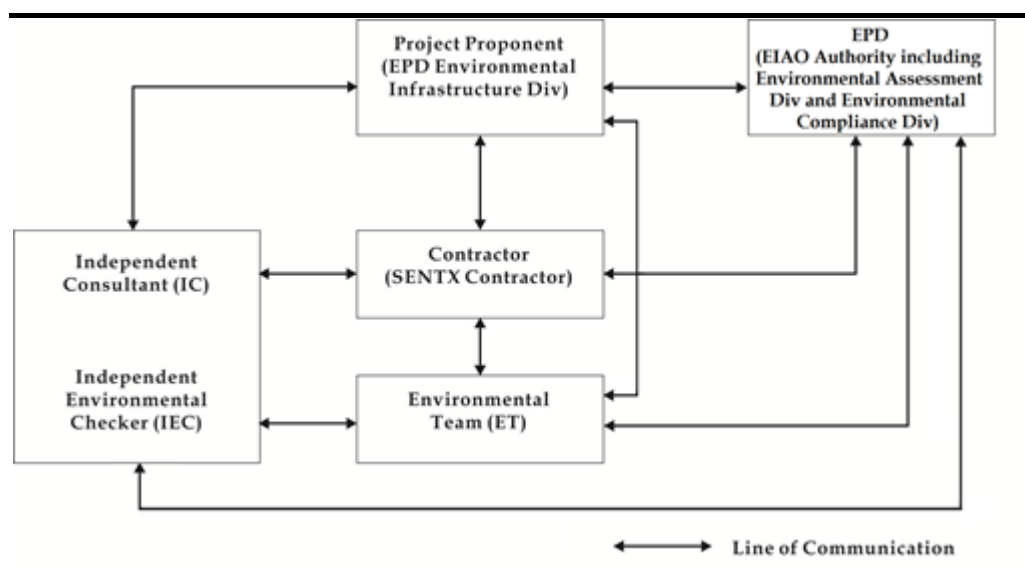
1.3 *SCOPE OF THE EM&A REPORT*

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 October 2019 for the construction 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 | Gary Barnicott | 2706 8827 |
| Environmental Team (ET) (ERM-Hong Kong, Limited) | ET Leader | Frank Wan | 2271 3152 |
| Independent Environmental Checker (IEC) (Meinhardt Infrastructure and Environment Limited) | IEC | Fredrick Leong | 2859 1739 |

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:

- Rebar fixing, concreting and formwork erection for the plinth and control buildings and placing generator at Landfill Gas Plant area;
- Excavating, removing and replacing unsuitable fill materials;
- Sediment trap remedial works;
- Construction of drop inlet shaft, outlet box culvert and X9B channel;
- Rebar fixing, formwork and concreting to the Leachate Treatment Plant (LTP) area and EPD, GVL and laboratory buildings;

- Rebar, formwork and concreting to the substructure of infrastructure buildings (EPD, GVL and laboratory buildings);
- Installation of ammonia stripping plant, equalization tank 2 and sequencing batch reactor tank 1 at LTP area;
- Construction of perimeter bund for Cell 1X and 2X;
- Maintenance and improvement of the temporary surface water drainage;
- Shotcreting and mass concrete for Buttress Wall;
- Installing groundwater pipe works along eastern perimeter bund; and
- CLP trench works.

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 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 |
| Surface Water Quality | |
| Baseline Monitoring | The results of baseline surface water quality monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.3 |
| 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 |
| Construction 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 construction works, impact monitoring of air quality, noise, surface water quality and waste management were carried out in the reporting period. The monitoring schedule of air quality, noise and surface water quality 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 summarised as below:

- One environmental management meeting was held with the Contractor, ER, ET, IEC and EPD on 16 October 2019; and
- Environmental toolbox trainings on Tree Protection and Renewable Energy were provided on 15 October and 31 October 2019 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 |
| Further Environmental Permit | FEP-01/308/2008/B | Granted on 16 May 2018 |
| Water Discharge License under WPCO (Permit Holder: Chun Wo) | Licence No.: WT00033525-2019 | Validity from 27 March 2019 to 31 March 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: Chun Wo) | 5213-839-C3507-10 | Issued on 23 August 2018 |
| | 5518-839-R2289-06 | Issued on 24 October 2019 |
| Construction Noise Permit (Permit Holder: Chun Wo) | GW-RE0695-19 | Validity from 9 September 2019 to 3 March 2020 |
| | GW-RE0831-19 | Validity from 17 October 2019 to 30 December 2019 |

The EM&A programme for the Project required environmental monitoring for air quality, noise and surface water quality as well as environmental site inspections for air quality, noise, surface water quality, 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 Monitoring Requirements and Equipment

According to the updated EM&A Manual of the Project, impact air quality monitoring (dust, in term of Total Suspended Particulates (TSP)) was carried out at the two designated monitoring locations (i.e. DM1 and DM2) at a 6-day interval. As there are two existing TSP monitoring stations (i.e. TKO-A1 and TKO-A2a) currently operating by the Civil Engineering and Development Department (CEDD) to monitor the 24-hour TSP levels at the proposed dust monitoring stations for the SENTX, it is considered that the CEDD monitoring data can represent the dust condition of the SENTX during the construction phase.

The Action and Limit Levels of the air quality 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 |
|--|--------------------------|--------------------------|
| DM-1 - Site Egress of TKO Area 137 Fill Bank | 204 $\mu\text{g m}^{-3}$ | 260 $\mu\text{g m}^{-3}$ |
| DM-2A -Combined Reception and Exit Office (CREO) of TKO Area 137 Fill Bank | 193 $\mu\text{g m}^{-3}$ | 260 $\mu\text{g m}^{-3}$ |

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 CEDD 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 air quality 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 |
|--------------------|---------------------------------------|-------------|------------------------------|-----------------------------------|--|
| DM1 | Site Egress of TKO Area 137 Fill Bank | 24-hour TSP | Once every 6 days during the | 1, 7, 13, 19, 25, 31 October 2019 | HVS Greasby 105 (S/N: 9795 (ET/EA/003/18)) |

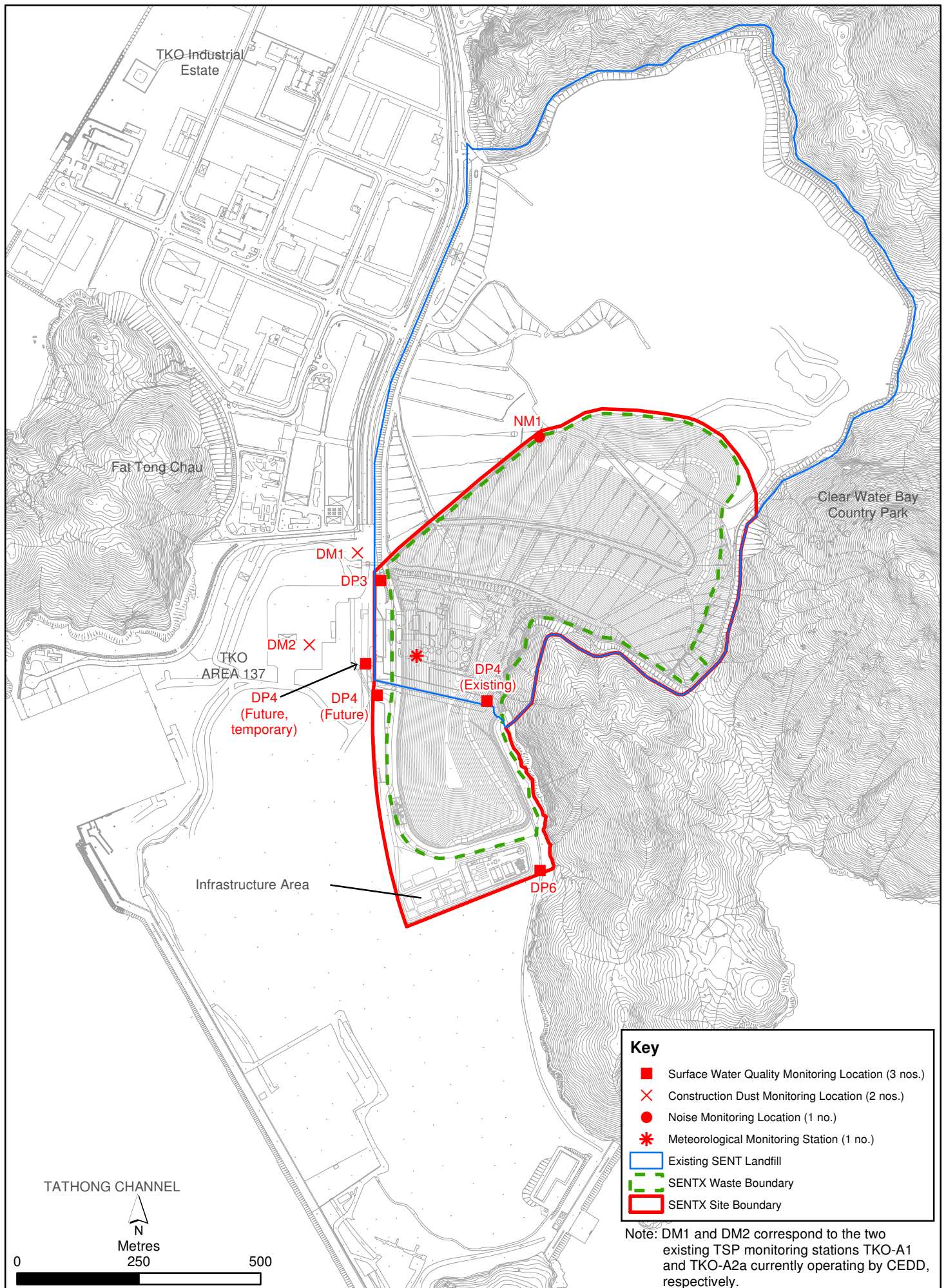


Figure 2.1

Environmental Impact Monitoring Locations

Environmental
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| Monitoring Station | Location | Parameter | Frequency and Duration | Monitoring Dates | Equipment |
|--------------------|---|-----------|-----------------------------------|------------------|---|
| DM2 | Combined Reception and Exit Office (CREO) of TKO Area 137 Fill Bank | | construction phase of the Project | | HVS Andersen G1051 (S/N: 1176 (ET/EA/003/05)) |

2.1.2 *Monitoring Schedule for the Reporting Month*

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

2.1.3 *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 | Average 24-hr TSP Concentration ($\mu\text{g m}^{-3}$) (Range in bracket) | Action Level ($\mu\text{g/m}^3$) | Limit Level ($\mu\text{g/m}^3$) |
|---|---|------------------------------------|-----------------------------------|
| DM-1 – Site Egress of TKO Area 137 Fill Bank | 91 (80 - 102) | 204 | 260 |
| DM-2A – Combined Reception and Exit Office (CREO) of TKO Area 137 Fill Bank | 90 (87 - 97) | 193 | 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 existing SENT landfill and the TKO Area 137 Fill Bank.

All the 24-hour TSP results were below the Action and Limit Levels at the monitoring locations in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in *Annex D3*.

2.1.4 *Meteorological Data*

Meteorological data obtained from the on-site meteorological monitoring station at the existing SENT landfill (see *Figure 2.1*) were used for the dust monitoring and are shown in *Annex D4*. The meteorological station will be relocated to a new position for SENTX as per the updated EM&A Manual after the new infrastructure area at the SENTX is constructed. It is considered that meteorological data obtained at the existing the on-site meteorological monitoring station are representative of the Project area and could be used for the construction phase dust monitoring programme for the Project.

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 minutes measurement between 07:00 and 19:00 hours on normal weekdays.

The Action and Limit Levels for construction noise of the Project are provided in *Table 2.4* below.

Table 2.4 *Action and Limit Levels for Construction Noise*

| Time Period | Action Level ^(a) | Limit Level ^(b) |
|--------------------------------------|---|----------------------------|
| 07:00 – 19:00 hrs on normal weekdays | When one documented complaint is received from any one of the noise sensitive receivers (NSRs) or 75 dB(A) recorded at the monitoring station | 75 dB(A) at NSRs |
| 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. | |

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 2.5*. Copies of the calibration certificates for the equipment are presented in *Annex E1*.

Table 2.5 *Noise Monitoring Details*

| Monitoring Station ⁽¹⁾ | 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 the construction period of the Project | 3, 9, 17, 24, 31 October 2019 | Sound Level Meter: B&K 2238 (S/N: 2285762) Acoustic Calibrator: Rion NC-75 (S/N: 34680623) |

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 2.6*. The monitoring results and the graphical presentation of the data are provided in *Annex E2*.

Table 2.6 Summary of Construction Noise Monitoring Results in the Reporting Period

| Monitoring Station | Measured Noise Level L_{eq} (30 min), dB(A) | | |
|--------------------|---|-------------|------------------------|
| | Average | Range | Action and Limit Level |
| NM1 | 53.1 | 50.8 - 55.1 | 75 |

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

No Action and Limit Levels exceedance was recorded for construction 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 SURFACE WATER QUALITY MONITORING

2.3.1 Monitoring Requirements and Equipment

According to the updated EM&A Manual of the Project, impact surface water quality monitoring were carried out at the three designated surface water discharge points (i.e. DP3, DP4 and DP6) weekly to ensure that the SENTX will not cause adverse water quality impact. Temporary relocation of surface water discharge point DP4 to DP4 (Future, temporary) as an interim arrangement due to site constraints and construction sequence was approved by EPD on 14 May 2019. Surface water quality monitoring was carried out at DP4 (Future, temporary) (i.e. DP4T) from the monitoring event on 16 May 2019. In addition, suspension of impact surface water quality monitoring at DP3 was approved under the Baseline Monitoring Report by EPD on 24 July 2019 until the actual commencement of construction works affecting DP3 in 2021.

Dissolved Oxygen (DO) and pH value were measured in-situ whereas the level of suspended solids (SS) were determined by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066).

The Action and Limit Levels of the surface water quality impact monitoring are provided in *Table 2.7*.

Table 2.7 Action and Limit Levels for Surface Water Quality

| Parameters | Action Level | Limit Level |
|------------|--------------|-------------|
| | DP4 & DP6 | |
| DO | < 5.80 mg/L | < 5.42 mg/L |

| Parameters | Action Level | Limit Level |
|------------|----------------------|-------------|
| | DP4 & DP6 | |
| SS | > 11.7 mg/L | > 12.7 mg/L |
| pH | > 8.39 | > 8.40 |

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 re-calibrated 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 2.8*. Copies of the calibration certificates for the equipment are presented in *Annex F1*.

Table 2.8 *Impact Surface Water Quality Monitoring Details*

| Monitoring Station | Location | Frequency | Monitoring Dates | Parameter | Equipment |
|----------------------------|-----------------------------------|-----------|-------------------------------|------------|---------------------------------------|
| DP4 (Future, temporary) | Surface water discharge point DP4 | Weekly | 3, 9, 17, 24, 31 October 2019 | •pH •DO | YSI Professional DSS (S/N: 15H102620) |
| DP6 | Surface water discharge point DP6 | | | •SS | |

Notes:

- (a) DP4 was temporary relocated to DP4 (Future, temporary) (i.e. DP4T) as an interim discharge point from the monitoring event on 16 May 2019.
- (b) Impact surface water quality monitoring at DP3 was suspended from the monitoring event on 25 July 2019 until the actual commencement of construction works affecting DP3 in 2021.

2.3.2 *Monitoring Schedule for the Reporting Month*

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

2.3.3 *Results and Observations*

A total of 5 monitoring events for impact surface water quality monitoring were scheduled at all designated monitoring stations during the reporting period. However, sampling was not carried out on 3 October 2019 at DP6 and on 24 and 31 October 2019 at all monitoring locations due to insufficient flow. Impact water quality monitoring results and graphical presentations are provided in *Annex F2*.

No action is thus required to be undertaken in accordance with the Event and Action Plan presented in *Annex F3*.

2.4 LANDSCAPE AND VISUAL MONITORING

2.4.1 *Monitoring Requirements*

According to the updated EM&A Manual of the Project, the monthly landscape and visual audit was conducted on 25 October 2019 to monitor the implementation of the landscape and visual mitigation measures during construction phase.

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

2.4.2 *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 identify the topsoil to be generated from the construction works and plan for the storage and re-use of the topsoil where practical. The Contractor shall consider the mitigation measures during the design phase, including the preparation of the Construction Drawings and Detailed Landscape Design Drawings.

2.5 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis with the Contractor, IEC and ER to monitor the implementation of proper environmental pollution control and mitigation measures for air quality, noise, surface water quality and waste management under the Project. In the reporting period, 4 site inspections were carried out on 3, 10, 16, 24 and 31 October 2019.

Key observations during the site inspections are summarised in *Table 2.9*.

Table 2.9 *Key Observations Identified during the Site Inspection in this Reporting Month*

| Inspection Date | Environmental Observations and Recommendations |
|------------------------|--|
| 3 October 2019 | <ul style="list-style-type: none">• The Contractor shall remove the exposed soil placed along the DP4T channel (near buttress wall) to reduce SS runoff to the channel and remove the deposited silt and grit at the channel regularly.• The Contractor shall clear the general refuse near future EPD building.• The Contractor shall dispose of the waste accumulated in the refuse skip near DP6 regularly to minimize odour and pest issues. |
| 10 October 2019 | <ul style="list-style-type: none">• The Contractor shall label the chemical placed near future bioplant building and dispose of as chemical waste in an enclosed container in accordance with the Code of Practice.• The Contractor shall clear the general refuse near future bioplant building and dispose of the waste accumulated regularly. |

| Inspection Date | Environmental Observations and Recommendations |
|-----------------|---|
| 16 October 2019 | <ul style="list-style-type: none"> The Contractor shall replace the NRMM label on the roller near sediment trap and ensure all NRMM labels displayed on site are in correct size as specified in the APCO. The Contractor shall maintain the concrete bund along the DP4T channel (near buttress wall) to minimize SS runoff to the channel and remove the deposited silt and grit at the channel regularly. The Contractor shall provide drip trays for all chemicals placed near future laboratory building and label the chemicals in accordance with the Code of Practice. |
| 24 October 2019 | <ul style="list-style-type: none"> The Contractor shall clear the oil spillage near buttress wall and handle the clean-up materials as chemical waste. |
| 31 October 2019 | <ul style="list-style-type: none"> The Contractor shall clear the oil spillage in the future laboratory building and handle the clean-up materials as chemical waste. The Contractor shall clear and dispose of the general refuse near site entrance and future LFG plant and the construction waste near future EPD building regularly to reduce odour and pest impacts. The Contractor shall collect general refuse in enclosed bins separately from recyclables and chemical waste near DP4T Wetsep and DP6. |

The Contractor has rectified all of the observations identified during environmental site inspections in the reporting period. Key environmental deficiencies identified and the corresponding rectification actions are presented in *Table 2.10*.

Table 2.10 *Summary of Environmental Deficiencies Identified and Corresponding Rectification Actions*

| Deficiencies | Rectifications Implemented | Proposed Additional Control Measures |
|---|---|---|
| Surface Water | | |
| Intercepting channels & drainage system | <ul style="list-style-type: none"> Reviewed drainage plan. | <ul style="list-style-type: none"> Addition of channels. Expedite the construction of permanent sediment trap and discharge culverts. |

| Deficiencies | Rectifications Implemented | Proposed Additional Control Measures |
|---|---|--|
| DP channels (design & regular silt removal) | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Installed silt fencing near surface water channel along DP6 channel. | <ul style="list-style-type: none"> Improve soil covering. Compaction and cover for stockpiles and soil slopes. |
| Wetsep (treatment capacity & number) | <ul style="list-style-type: none"> Reviewed Wetsep capacity. Chemicals dosage of the Wetsep was increased to enhance the efficiency. | <ul style="list-style-type: none"> Install additional Wetsep. |
| Backflow / ponding during heavy rainfall | <ul style="list-style-type: none"> Raised with EPD (LDG) and CEDD. | N.A. |

2.6

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 non-inert construction 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 summarised in *Table 2.11*.

Table 2.11 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 '000m ³) | Non-inert Construction Waste (b) (in '000m ³) | Recyclable Materials (c) (in '000kg) | Chemical Wastes (in '000kg) |
|----------------------|---|------------------------------|----------|--|--|--|-----------------------------------|
| | | Rock | Soil | | | | |
| 1 - 31 October 19 | 0.064 | 0 | 10567.52 | 0 | 0.087 | 0 | 0 |

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) Non-inert construction wastes include general refuse disposed at landfill. Density assumption: 0.9 (kg/L) for general refuse.
- (c) Recyclable materials include metals, paper, cardboard, plastics and others.

2.7 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.

2.8 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

The 24-hour TSP monitoring results and construction noise monitoring results complied with the Action and Limit Levels in the reporting period. No exceedance of Action and Limit Levels was recorded for surface water quality impact monitoring.

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

2.9 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 G*.

3 *FUTURE KEY ISSUES*

3.1 *CONSTRUCTION PROGRAMME FOR THE COMING MONTH*

As informed by the Contractor, the major works for the Project in November 2019 will be:

- Site clearance, preparation and formation of Area X1 and X2;
- Excavation and removal of unsuitable fill materials;
- Remaining site formation works at Area X1;
- Filling of perimeter bund for Cell 2X;
- Construction of buttress wall;
- Construction of perimeter wall and plinths at LTP area and substructure at bioplant;
- Installation of ammonia stripping plant, equalization and sequencing batch reactor tanks and other equipment at LTP area;
- Construction of CLP trench;
- Excavation and construction of discharge box culvert;
- Construction of superstructure of new infrastructure buildings;
- Construction of plinths and superstructure of Landfill Gas Plant area;
- Construction of X9B channels;
- Construction of groundwater pipe from east to south in Cell 1X and 2X perimeter bund;
- Construction of superstructure at maintenance building;
- Installation of settlement cells; and
- Installation of monitoring wells.

3.2 *KEY ISSUES FOR THE COMING MONTH*

Potential environmental impacts arising from the above upcoming construction activities in the next reporting period of November 2019 are mainly associated with dust emission from the exposed area and loading and unloading operation of dusty materials. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

3.3

MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedules for environmental monitoring in November 2019 are provided in *Annex H*.

CONCLUSION AND RECOMMENDATION

This EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 October 2019 in accordance with the updated EM&A Manual and the requirements of the Environmental Permit (EP-308/2008/B).

Air quality (24-hour TSP), noise and water quality (DO, pH and SS) monitoring were carried out in the reporting period. Results for air quality monitoring (24-hour TSP) complied with the Action and Limit Levels in the reporting period. No Action and Limit Levels exceedances were recorded for construction noise monitoring. No exceedance of Action and Limit Levels for surface water quality impact monitoring was 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 works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Annex A

Work Programme

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 | |
|---|----------|--|--|--|-------------------------------|---|---|-----|---|--|--|---|
| | | | | | | D | C | O/R | A | | | |
| <i>Air Quality - Construction Phase</i> | | | | | | | | | | | | |
| 4.8.1 | AQ1 | <u>Blasting</u> <ul style="list-style-type: none"> 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 fragments and material resulting from blasting | To minimise potential dust nuisance | Blasting area and 30m of blasting area | SENTX Contractor | | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> | Not applicable. Blasting is not required in the latest landfill design |
| 4.8.1 | AQ2 | <u>Rock Drilling</u> <ul style="list-style-type: none"> 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 | | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> | Not applicable. Rock drilling 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|----------|----------|--|--|-----------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| 4.8.1 | AQ3 | <u>Site Access Road</u> <ul style="list-style-type: none"> 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 limited to 10kph. | To minimise potential dust nuisance | Main haul road | SENTX Contractor | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | Reminder was given to Contractor |
| 4.8.1 | AQ4 | <u>Stockpiling of Dusty Materials</u> <ul style="list-style-type: none"> 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 with water so as to ensure that the entire surface is wet. | To minimise potential dust nuisance | All construction works area | SENTX Contractor | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | Implemented |
| 4.8.1 | AQ5 | <u>Loading, unloading or transfer of dusty materials</u> <ul style="list-style-type: none"> 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 | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | Implemented |
| 4.8.1 | AQ6 | <u>Site Boundary and Entrance</u> <ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of height not less than 2.4m from | To minimise potential dust nuisance | Site boundary and entrance | SENTX Contractor | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-</i> | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|----------|----------|---|--|-----------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | ground level will be provided along the entire length of that portion of the site boundary except for the site entrance or exit. | | | | | | | | | <i>TM Annex 4</i> |
| 4.8.1 | AQ7 | <u>Excavation Works</u> <ul style="list-style-type: none"> 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 | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | Not applicable |
| 4.8.1 | AQ8 | <u>Building Demolition</u> <ul style="list-style-type: none"> 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 | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | Not applicable |
| 4.8.1 | AQ9 | <u>Construction of the Superstructure of Building</u> <ul style="list-style-type: none"> 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 | | | | ✓ | <i>Air Pollution Control (Construction Dust) Regulations</i> <i>HKAQO and EIAO-TM Annex 4</i> | 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 |
|----------|----------|--|--|--|-------------------------------|---|---|-----|---|--|--|
| | | | | | | D | C | O/R | A | | |
| 4.8.1 | AQ10 | Should a stone crushing plant be needed on site, the control measures recommended in the <i>Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1</i> should be implemented. | To minimise potential dust nuisance | Stone crushing plant/ construction phase | SENTX Contractor | | ✓ | | | <i>Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1</i> | Not applicable. Stone crushing plant is not required in the latest landfill design |
| 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 gaseous emissions. | To minimise potential dust nuisance | All construction works area | SENTX Contractor | | ✓ | | | <i>HKAQO and EIAO-TM Annex 4</i> | Implemented |
| 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 <i>Figure 3.2a</i> | SENTX Contractor | | ✓ | | | <i>HKAQO and EIAO-TM Annex 4</i> | 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 <i>Figure 11.3a</i> | SENTX Contractor | | ✓ | ✓ | | <i>HKAQO and EIAO-TM Annex 4</i> | Implemented |
| 4.10.2 | AQ46 | Monitoring of meteorological station, continuously | Collect site specific meteorological data | At meteorological station shown in <i>Figure 11.3a</i> | SENTX Contractor | | ✓ | ✓ | ✓ | - | Implemented |

Noise – Construction Phase

| 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 |
|----------|----------|---|--|-----------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| 5.7.1 | N1 | <p>Adopt good site practice listed below:</p> <ul style="list-style-type: none"> • Only well-maintained plant will be operated on-site and plant should be serviced regularly during the construction program; • 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 possible; • 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 on-site construction activities. | To minimise potential construction noise nuisance. | All construction works area | SENTX Contractor | | | ✓ | | <i>Noise Control Ordinance (NCO) and EIAO-TM Annex 5</i> | 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 |
|---|----------|---|---|--|-------------------------------|---|---|-----|---|--|---|
| | | | | | | D | C | O/R | A | | |
| 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 |
| Water Quality – Construction Phase | | | | | | | | | | | |
| 6.8.1 | WQ1 | <u>Construction Runoff</u> <ul style="list-style-type: none"> 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 | Deficiency of mitigation measures but rectified by the Contractor |
| 6.8.1 | WQ2 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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. | 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 | Deficiency of mitigation measures but rectified by the Contractor |
| 6.8.1 | WQ4 | <ul style="list-style-type: none"> Temporary covers such as tarpaulin will also be provided to minimise the generation of high SS runoff. | To minimise potential water quality impacts arising from the construction works | All construction works area | SENTX Contractor | | ✓ | | | ProPECC PN 1/94 WPCO | Implemented |
| 6.8.1 | WQ5 | <ul style="list-style-type: none"> The surface runoff contained any oil | To minimise potential | All | SENTX | | ✓ | | | ProPECC PN 1/94 | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|----------|----------|---|--|---|-------------------------------|---|---|-----|---|--|--|
| | | | | | | D | C | O/R | A | | |
| | | and grease will pass through the oil interceptors. | water quality impacts arising from the construction works | construction works area | Contractor | | | | | WPCO EIAO-TM Annex 6 | |
| 6.8.1 | WQ6 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> The fuel and waste lubricant oil from the on-site maintenance of machinery and equipment will be collected by a licensed chemical waste collector. | To minimise potential water quality impacts arising from improper handling of fuel and oil | SENTX Site | SENTX Contractor | | ✓ | | | ProPECC PN 1/94 WPCO Waste Disposal Ordinance (WDO) | Implemented |
| 6.8.1 | WQ9 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 |

| 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 |
|----------|----------|---|---|--------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| 6.8.2 | WQ11 | <u>Sewage Effluents</u> • 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. | To minimise potential water quality impacts arising from the sewage effluents | SENTX Site | SENTX Contractor | | | ✓ | | WPCO WDO | Implemented |
| 6.8.2 | WQ13 | • A licensed waste collector will be employed to clean the chemical toilets on a regular basis. | To minimise potential water quality impacts arising from the sewage effluents | SENTX Site | SENTX Contractor | | | ✓ | | WPCO WDO | Implemented |

Waste Management – 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 | <u>Management of Waste Disposal</u> 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 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 | To ensure that adverse environmental impacts are prevented | SENTX Site | SENTX Contractor | | | ✓ | | WDO <i>Waste Disposal (Charges for Disposal of Construction Waste) Regulation;</i> <i>Works Bureau Technical Circular No.31/2004; and</i> | 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 |
|----------|----------|--|--|--------------------------|-------------------------------|---|---|-----|---|--|---|
| | | | | | | D | C | O/R | A | | |
| | | <p>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.</p> <p>A recording system for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established.</p> | | | | | | | | Annex 5 and Annex 6 of Appendix G of ETWBTC No. 19/2005) | |
| 7.6.1 | WM3 | <u>Measures for the Reduction of Construction Waste Generation</u> | | | | | | | | | |
| | | 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 | <u>Chemical Waste</u> | | | | | | | | | |
| | | The construction contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the <i>Code of Practice on the Packaging, Handling and Storage of</i> | To ensure proper handling of chemical waste | SENTX Site | SENTX Contractor | | | | ✓ | WDO <i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i> | Deficiency of mitigation measures but rectified by the Contractor |

| 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 |
|-------------------------------|----------|---|--|--------------------------|-------------------------------|---|---|-----|---|--|---|
| | | | | | | D | C | O/R | A | | |
| <i>Chemical Wastes.</i> | | | | | | | | | | | |
| 7.6.1 | WM5 | <u>Sewage</u> 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 | ✓ | | | | WDO EIAO-TM Annex 7 | Implemented |
| 7.6.1 and SENTX latest design | WM6 | <u>General Refuse</u> 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 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 | Deficiency of mitigation measures but rectified by the Contractor |
| 7.6.1 | WM7 | <u>Staff Training</u> 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 | To ensure that adverse environmental impacts are prevented | SENTX Site | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|---|----------|---|--|---|-------------------------------|---|---|-----|--|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | waste reduction, reuse and recycling. | | | | | | | | | |
| 7.8 | WM8 | <u>Environmental Monitoring & Audit Requirements</u> Weekly audits of the waste management practices will be carried out during the construction phase. The audits examine all aspects of waste management including waste generation, storage, recycling, transport and disposal. | To ensure that adverse environmental impacts are prevented | SENTX Site | SENTX Contractor | | ✓ | | WDO | | Implemented |
| Landfill Gas Hazards - Design and Construction 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 <i>Landfill Gas Hazard Assessment Guidance Notes (the Guidance Note)</i> . Those precautionary measures applicable to the SENTX will be confirmed in the detailed Qualitative Landfill Gas Hazard Assessment to be submitted by the contractor. | To protect workers from landfill gas risk | All construction works area | SENTX Contractor | | ✓ | | <i>Paragraphs 8.3 to 8.49 of EPD's Landfill Gas Hazards Assessment Guidance Note</i> <i>EIAO-TM Annex 7</i> | | 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 Paragraphs 8.23 to 8.28 of EPD's <i>Guidance Note</i> will be followed. | To protect workers from landfill gas risk | Confined space within the construction works area | SENTX Contractor | | ✓ | | | | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|----------|----------|---|--|--------------------------|-------------------------------|---|---|-----|---|---|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | 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 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. | To protect workers from landfill gas risk | SENTX Site | SENTX Contractor | ✓ | ✓ | ✓ | ✓ | EIAO-TM Annex 7 | Implemented |
| 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 <i>Guidance Notes</i>). Landfill gas monitoring boreholes will be installed at the edge of the waste slope | To protect workers from landfill gas risk | Infrastructure Area | SENTX Contractor | ✓ | ✓ | | | EPD's <i>Landfill Gas Hazards Assessment Guidance Note</i> EIAO-TM Annex 7 | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|-------------------------------------|----------|--|--|-----------------------------|-------------------------------|---|---|-----|---|---|--|
| | | | | | | D | C | O/R | A | | |
| | | between the waste and the new infrastructure area to monitor the migration of landfill gas, if any. | | | | | | | | | |
| Ecology - Construction Phase | | | | | | | | | | | |
| 9.10.2 | EC1 | Measures to control construction runoff: <ul style="list-style-type: none"> Exposed soil areas will be minimised to reduce the contamination of runoff and erosion; 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; 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; Temporary covers such as tarpaulin will also be provided to minimise the generation of high suspended solids runoff; | To minimise potential water quality impacts affecting ecological resources | All construction works area | SENTX Contractor | | | | ✓ | <i>EIAO-TM Annex 16</i> <i>ProPECC PN 1/94</i> <i>Water Pollution Control Ordinance (WPCO)</i> <i>EIAO-TM Annex 6</i> - - - | Deficiency of mitigation measures but rectified by the Contractor Implemented Deficiency of mitigation measures but rectified by the 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|--------------------------------|----------|---|---|--------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | <ul style="list-style-type: none"> The surface runoff contained any oil and grease will pass through the oil interceptors; and, 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. | | | | | | | | - | Not applicable |
| | | | | | | | | | | - | Implemented |
| 9.10.2 and SENTX latest design | EC2 | <u>Good Construction Practice:</u> <ul style="list-style-type: none"> 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. | To minimise potential ecological impacts arising from the Project | SENTX Site | SENTX Contractor | | | | ✓ | <i>EIAO-TM Annex 16</i> | Implemented |
| 9.12.1 | EC9 | <u>Environmental Monitoring & Audit Requirements</u> The implementation of the ecological mitigation measures should be checked as part of the environmental monitoring and audit procedures during the | To ensure that adverse ecological impacts are prevented | SENTX | SENTX Contractor | | ✓ | ✓ | ✓ | <i>EIAO-TM Annex 16</i> | 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 |
|--|----------|--|--|-----------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| construction period. | | | | | | | | | | | |
| Landscape and Visual – Construction Phase | | | | | | | | | | | |
| 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 | ✓ | | | | <i>EIAO-TM Annex 18 and ETWBC 3/2006</i> | Implemented |
| 10.6.5 | LV2 | CM2 - Topsoil, where identified, will be stripped and stored for re-use in the construction of the soft landscape works, where practical. The Contract Specification will include storage and reuse of topsoil as appropriate. | To minimise the landscape and visual impacts | All construction works area | SENTX Contractor | ✓ | | | | <i>EIAO-TM Annex 18</i> | Implemented |
| 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. | To minimise the landscape and visual impacts | Potential impacted area | SENTX Contractor | ✓ | | | | <i>EIAO-TM Annex 18 and ETWBC 3/2006</i> | Implemented |
| 10.6.5 | LV4 | CM4 - Trees unavoidably affected by the works will be transplanted, where necessary and practical. A detailed Tree | To minimise the landscape and visual impacts | Potential impacted area | SENTX Contractor | ✓ | ✓ | | | <i>EIAO-TM Annex 18 and ETWBC 3/2006</i> | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|--------------------------------|----------|--|--|--------------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | 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 | | ✓ | | | <i>EIAO-TM Annex 18</i> | Implemented |
| 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 | ✓ | ✓ | | | <i>EIAO-TM Annex 18</i> | Not applicable |
| 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 | To minimise the landscape and visual impacts | Infrastructure area | SENTX Contractor | ✓ | ✓ | | | <i>EIAO-TM Annex 18 and ETWBC 7/2002</i> | 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? | When to implement the measure? ⁽¹⁾ | | | | What requirements or standards for the measure to achieve? | Implementation Status and Remarks |
|--------------------------------|----------|--|---|--------------------------|-------------------------------|---|---|-----|---|--|-----------------------------------|
| | | | | | | D | C | O/R | A | | |
| | | site, along access roads and in and around car parks. This will be supplemented with shrub planting, where appropriate. | | | | | | | | | |
| 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 for the restoration. | To minimise the landscape and visual impacts | SENTX Site | SENTX Contractor | | ✓ | | | <i>EIAO-TM Annex 18</i> | Not applicable |
| 11.4.1 and SENTX latest design | LV9 | 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 | ✓ | ✓ | | | <i>EIAO-TM Annex 18</i> | Implemented |

Annex C

Monitoring Schedule for This Reporting Period

**South East New Territories (SENT) Landfill Extension
EM&A Impact Monitoring Schedule during Construction Phase**

October 2019

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----------------------|----------------------|----------------------|---|---|-----------------------|-----------------------|
| | | 1 Dust Monitoring | 2 | 3 Surface Water Monitoring (pm) Noise Monitoring (pm) | 4 | 5 |
| 6 | 7 Dust Monitoring | 8 | 9 Surface Water Monitoring (pm) Noise Monitoring (pm) | 10 | 11 | 12 |
| 13 Dust Monitoring | 14 | 15 | 16 | 17 Surface Water Monitoring (pm) Noise Monitoring (pm) | 18 | 19 Dust Monitoring |
| 20 | 21 | 22 | 23 | 24 Surface Water Monitoring (pm) Noise Monitoring (pm) | 25 Dust Monitoring | 26 |
| 27 | 28 | 29 | 30 | 31 Dust Monitoring Surface Water Monitoring (pm) Noise Monitoring (pm) | | |

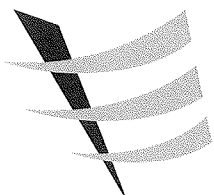
Note:
Impact dust monitoring will be conducted at two monitoring stations (DM1 and DM2) under the on-going EM&A programme TKO Area 137 Fill Bank and the results will be shared with SENTX.

Annex D

Air Quality

Annex D1

Calibration Certificates for Dust Monitoring Equipment



Calibration Report
of
High Volume Air Sampler

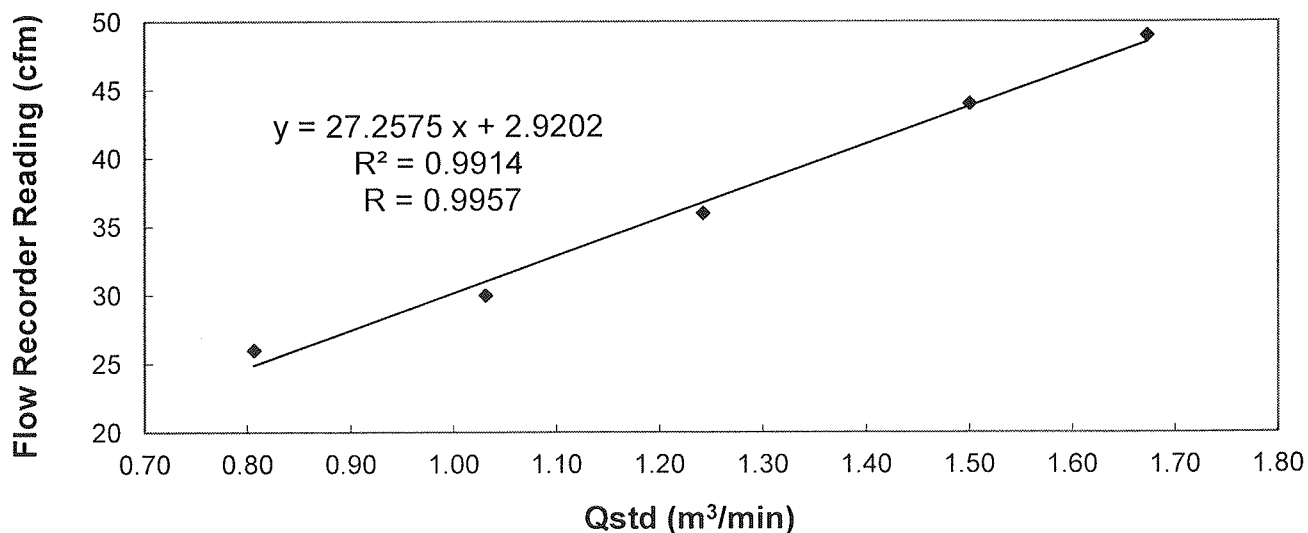
Manufacturer : Graseby 105 Date of Calibration : 26 August 2019

Serial No. : 9795 (ET / EA / 003 / 18) Calibration Due Date : 25 October 2019

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

| | | | | | | |
|---------|--|---------------|------|------|------|------|
| Results | Flow recorder reading (cfm) | 49 | 44 | 36 | 30 | 26 |
| | Qstd (Actual flow rate, m ³ /min) | 1.67 | 1.50 | 1.24 | 1.03 | 0.81 |
| | Pressure : 753.06 mm Hg | Temp. : 302 K | | | | |

Sampler 9795 Calibration Curve
Site: Tseung Kwan O 137 (TKO-A1)

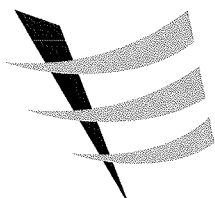


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / ~~does not comply*~~ with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : MAK, Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Checked by : LAU, Chi Leung
LAU, Chi Leung
(Environmental Team Leader)



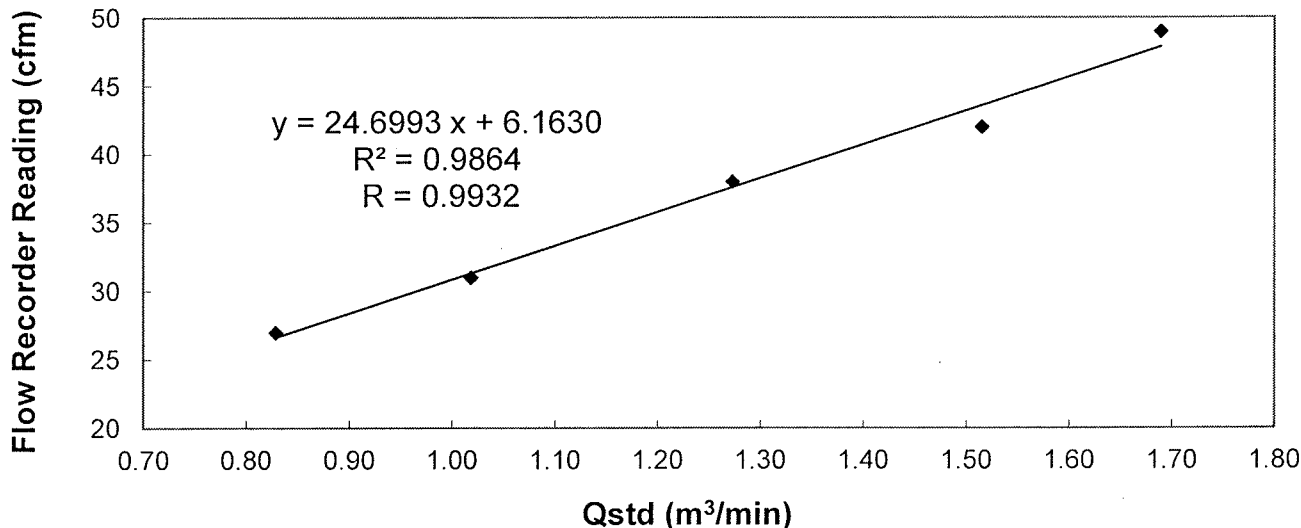
Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby 105 _____ Date of Calibration : 23 October 2019 _____
Serial No. : 9795 (ET / EA / 003 / 18) _____ Calibration Due Date : 22 December 2019 _____
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results

| | | | | | |
|--|---------------|------|------|------|------|
| Flow recorder reading (cfm) | 49 | 42 | 38 | 31 | 27 |
| Qstd (Actual flow rate, m ³ /min) | 1.69 | 1.51 | 1.27 | 1.02 | 0.83 |
| Pressure : 760.56 mm Hg | Temp. : 299 K | | | | |

Sampler 9795 Calibration Curve
Site: Tseung Kwan O 137 (TKO-A1)

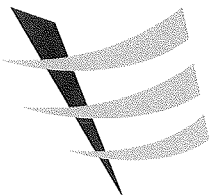


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / does not comply* with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : MAK, Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Checked by : LAU, Chi Leung
LAU, Chi Leung
(Environmental Team Leader)



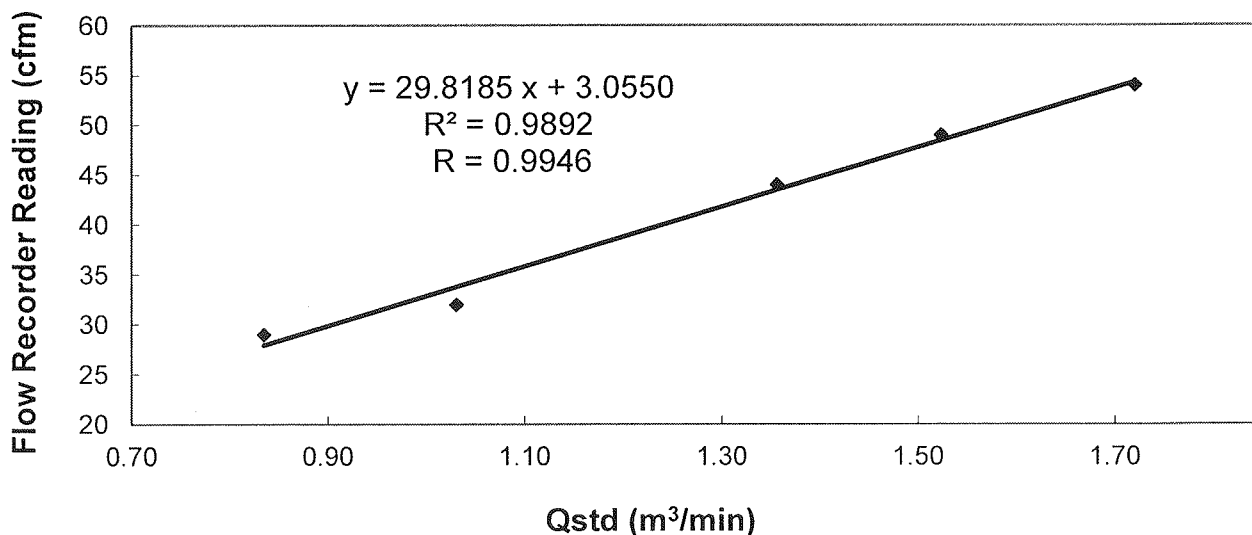
Calibration Report
of
High Volume Air Sampler

Manufacturer : Andersen G1051 Date of Calibration : 26 August 2019
Serial No. : 1176 (ET / EA / 003 / 05) Calibration Due Date : 25 October 2019
Method : Based on Operations Manual for the 5-point calibration using standard calibration kit manufactured by Tisch TE-5025 A

Results :

| | | | | | |
|--|---------------|------|------|------|------|
| Flow recorder reading (cfm) | 54 | 49 | 44 | 32 | 29 |
| Qstd (Actual flow rate, m ³ /min) | 1.72 | 1.52 | 1.36 | 1.03 | 0.83 |
| Pressure : 753.06 mm Hg | Temp. : 302 K | | | | |

Sampler 1176 Calibration Curve
Site: Tseung Kwan O 137 (TKO-A2a)

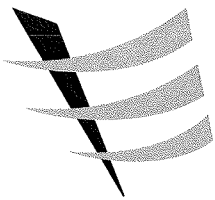


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / does not comply* with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : MAK, Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Checked by : LAU, Chi Leung
LAU, Chi Leung
(Environmental Team Leader)

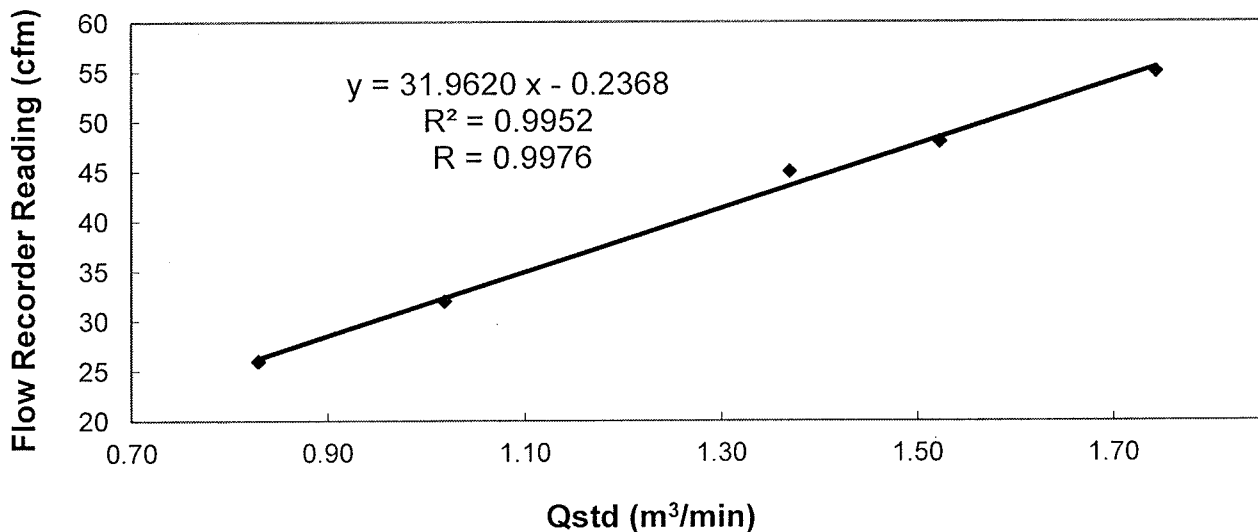


Calibration Report
of
High Volume Air Sampler

Manufacturer : Andersen G1051 _____ **Date of Calibration** : 23 October 2019 _____
Serial No. : 1176 (ET / EA / 003 / 05) _____ **Calibration Due Date** : 22 December 2019 _____
Method : Based on Operations Manual for the 5-point calibration using standard calibration kit
manufactured by Tisch TE-5025 A

| | | | | | | |
|------------------|--|---------------|------|------|------|------|
| Results : | Flow recorder reading (cfm) | 55 | 48 | 45 | 32 | 26 |
| | Qstd (Actual flow rate, m ³ /min) | 1.74 | 1.52 | 1.37 | 1.02 | 0.83 |
| | Pressure : 760.56 mm Hg | Temp. : 299 K | | | | |

Sampler 1176 Calibration Curve
Site: Tseung Kwan O 137 (TKO-A2a)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies* / does not comply* with the specified requirements and is deemed acceptable* / unacceptable* for use.

Calibrated by : MAK, Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Checked by : LAU, Chi Leung
LAU, Chi Leung
(Environmental Team Leader)

Annex D2

24-hour TSP Monitoring Results

Table D2.1 24-hour TSP Monitoring Results at DM1

| Start Date | Start Time | Finish Date | Finish Time | Weather | 24-hour TSP ($\mu\text{g}/\text{m}^3$) |
|----------------|------------|-------------|-------------|---------|--|
| 1 Oct 19 | 8:00 | 2-Oct-19 | 8:00 | Fine | 102 |
| 7 Oct 19 | 8:30 | 8-Oct-19 | 8:30 | Rainy | 86 |
| 13 Oct 19 | 8:30 | 14-Oct-19 | 8:30 | Rainy | 99 |
| 19 Oct 19 | 8:30 | 20-Oct-19 | 8:30 | Cloudy | 80 |
| 25 Oct 19 | 16:40 | 26-Oct-19 | 16:40 | Cloudy | 85 |
| 31 Oct 19 | 8:00 | 1-Nov-19 | 8:00 | Fine | 92 |
| Average | | | | | 91 |
| Min | | | | | 80 |
| Max | | | | | 102 |

Note:

DM1 corresponds to the existing TSP monitoring station TKO-A1 currently operating by CEDD.

Figure D2.1 Graphical Presentation for 24-hr TSP Monitoring at DM1

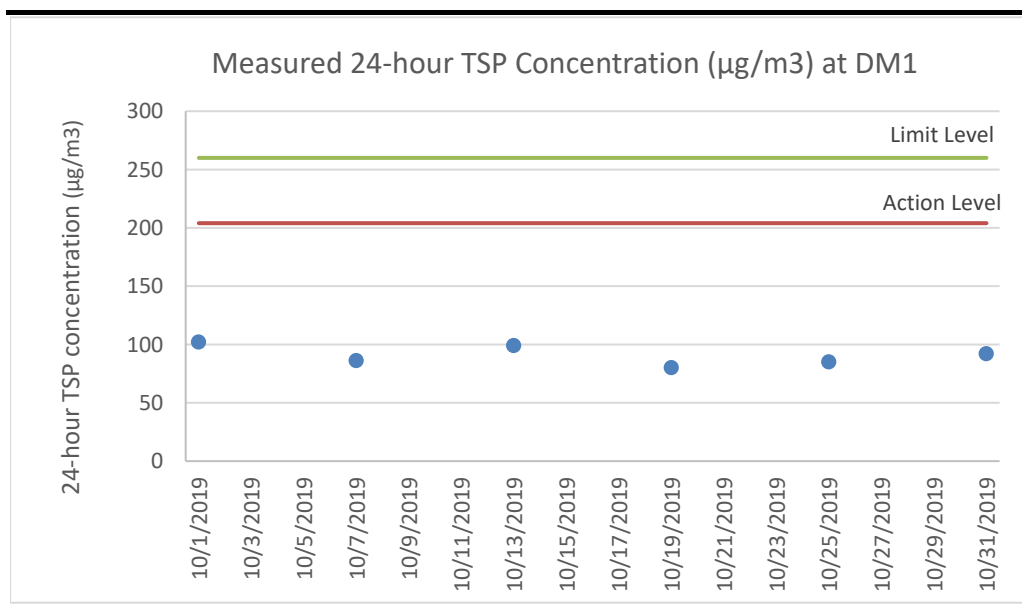
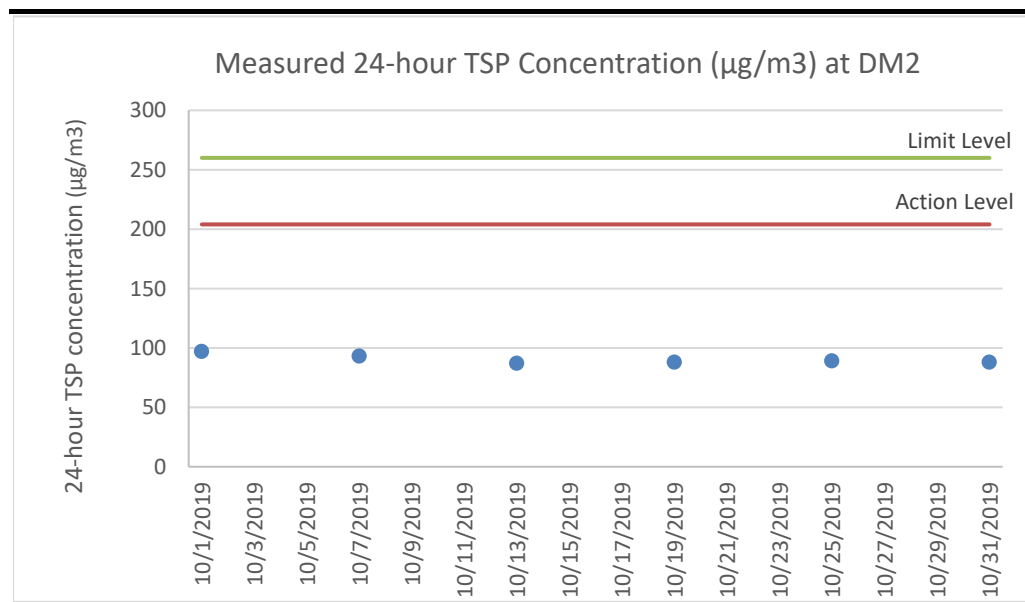


Table D2.2 24-hour TSP Monitoring Results at DM2

| Start Date | Start Time | Finish Date | Finish Time | Weather | 24-hour TSP ($\mu\text{g}/\text{m}^3$) |
|----------------|------------|-------------|-------------|---------|--|
| 1 Oct 19 | 8:00 | 2-Oct-19 | 8:00 | Fine | 97 |
| 7 Oct 19 | 8:30 | 8-Oct-19 | 8:30 | Rainy | 93 |
| 13 Oct 19 | 8:30 | 14-Oct-19 | 8:30 | Rainy | 87 |
| 19 Oct 19 | 8:30 | 20-Oct-19 | 8:30 | Cloudy | 88 |
| 25 Oct 19 | 16:47 | 26-Oct-19 | 16:47 | Cloudy | 89 |
| 31 Oct 19 | 8:00 | 1-Nov-19 | 8:00 | Fine | 88 |
| Average | | | | | 90 |
| Min | | | | | 87 |
| Max | | | | | 97 |

Note:
DM2 corresponds to the existing TSP monitoring station TKO-A2a currently operating by CEDD.

Figure D2.2 Graphical Presentation for 24-hr TSP Monitoring at DM2



Annex D3

Event and Action Plan for Dust Monitoring

Annex D3 *Event and Action Plan for Dust Monitoring During Construction Phase*

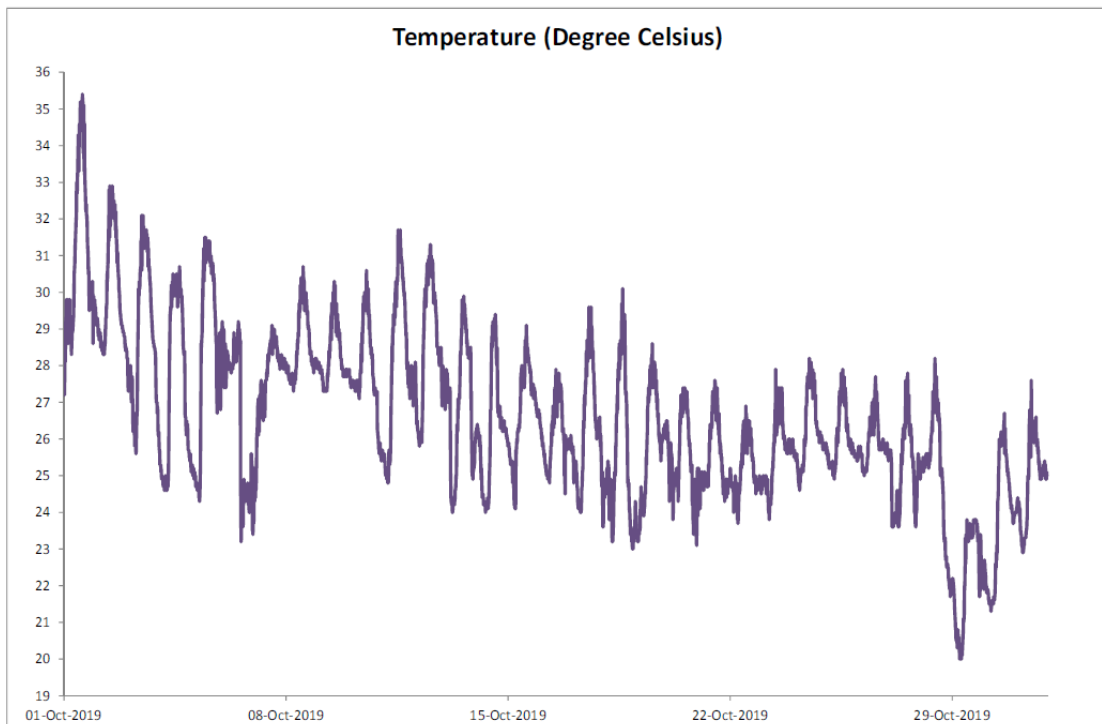
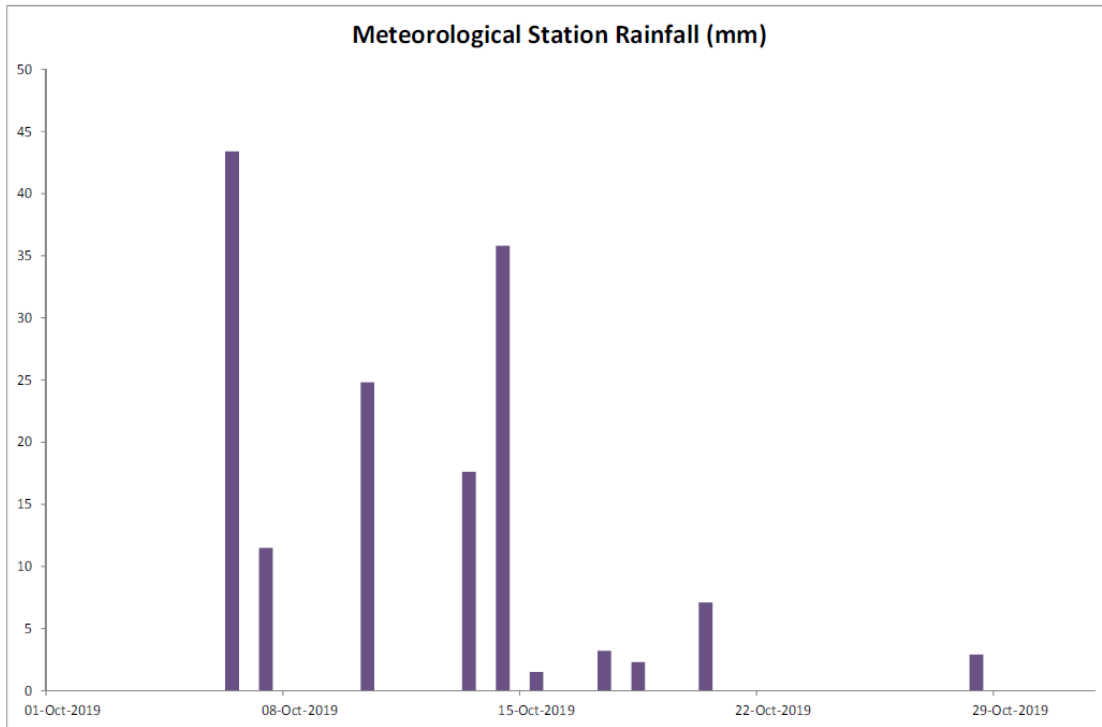
| Event | Action | | |
|--|--|--|--|
| | ET | IEC | Contractor |
| <i>Action Level</i> | | | |
| Exceedance for one sample | <ul style="list-style-type: none"> Identify the source(s) and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project Repeat measurement to confirm finding if exceedance is due to the Project Increase monitoring frequency to daily if exceedance is due to the Project and continue until the monitoring results reduce to below action level | <ul style="list-style-type: none"> Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods | <ul style="list-style-type: none"> Rectify any unacceptable practice Amend working methods if appropriate |
| Exceedance for two or more consecutive samples | <ul style="list-style-type: none"> Identify the source(s) and investigate the cause(s) of exceedance 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 If exceedance continues, arrange meeting with Contractor & IEC Continue monitoring at daily intervals if exceedance is due to the Project If no exceedance for 3 consecutive days, cease additional monitoring | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate |

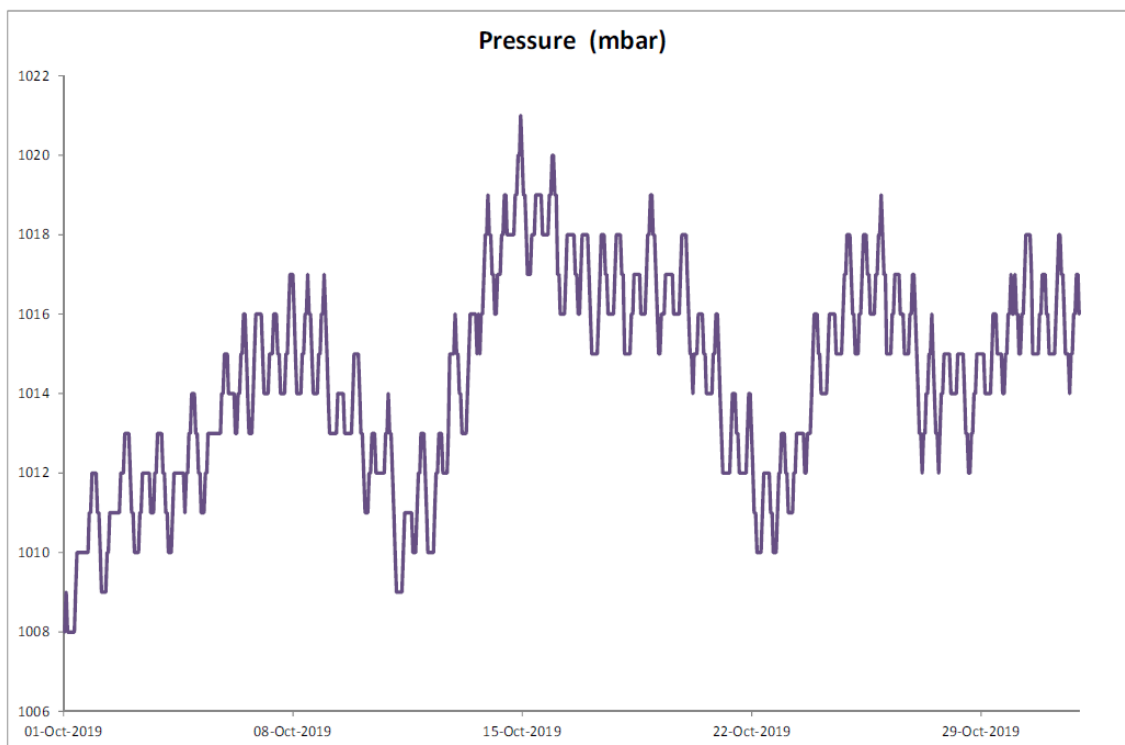
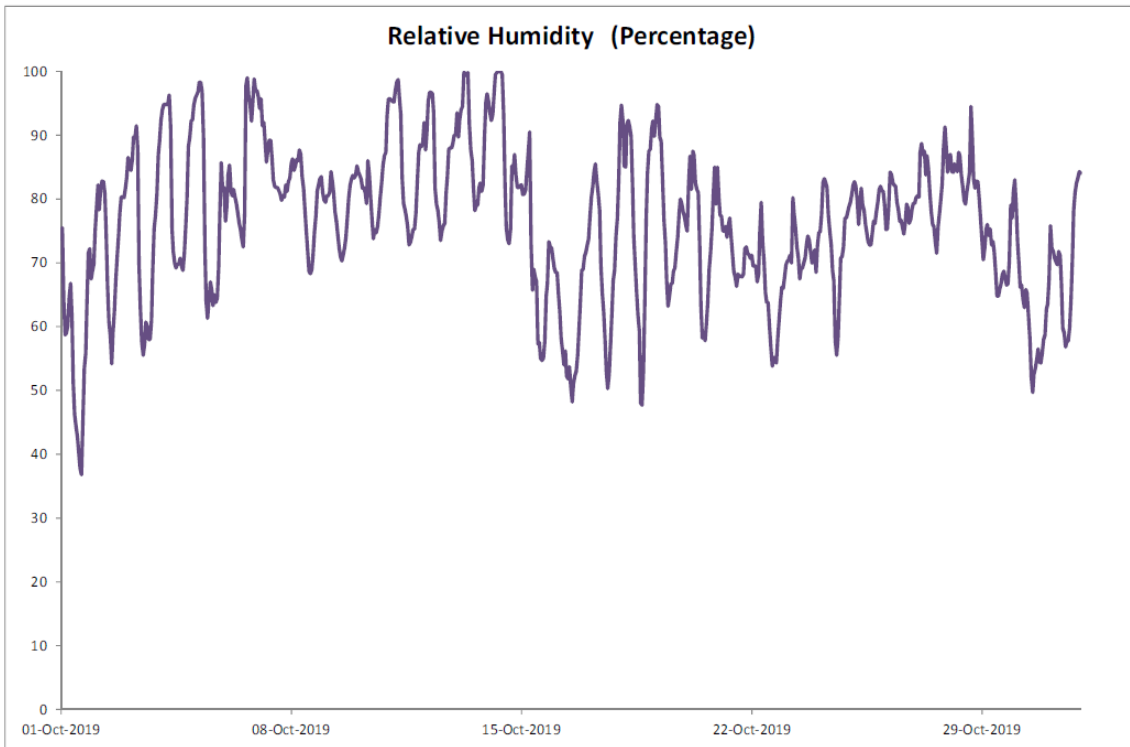
| Event | Action | | |
|--|---|--|---|
| | ET | IEC | Contractor |
| <i>Limit Level</i> | | | |
| Exceedance for one sample | <ul style="list-style-type: none"> Identify the source(s) and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD 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 daily if exceedance is due to the Project and continue until the monitoring results reduce to below limit level | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Take immediate action to avoid further exceedance Submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate |
| Exceedance for two or more consecutive samples | <ul style="list-style-type: none"> Identify source(s) and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD the causes & actions taken for the exceedances Discuss with Contractor and IEC for remedial measures required Ensure remedial measures are properly implemented Continue monitoring at daily intervals if exceedance is due to the Project If no exceedance for 3 consecutive days, cease additional monitoring If exceedance due to the Project continues, consider what portion of the work is responsible and stop that portion of work until the exceedance is abated | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Take immediate action to avoid further exceedance Submit proposals for remedial measures to IEC Implement the agreed proposals Resubmit proposals if problem still not under control |

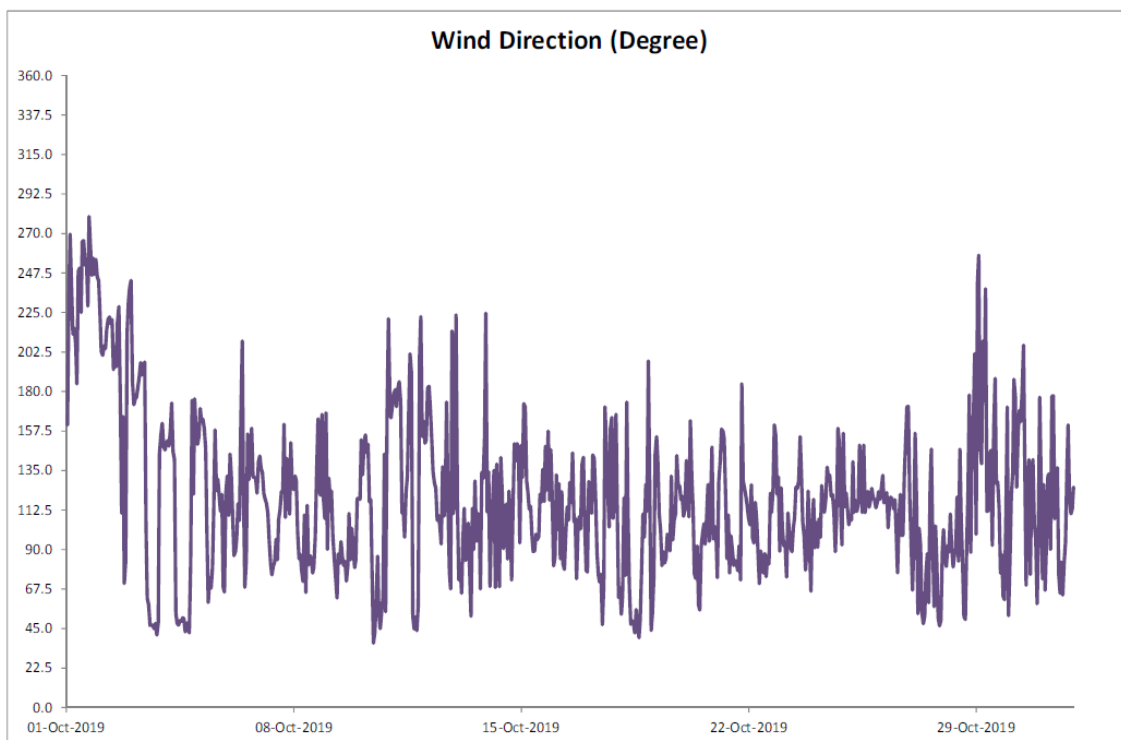
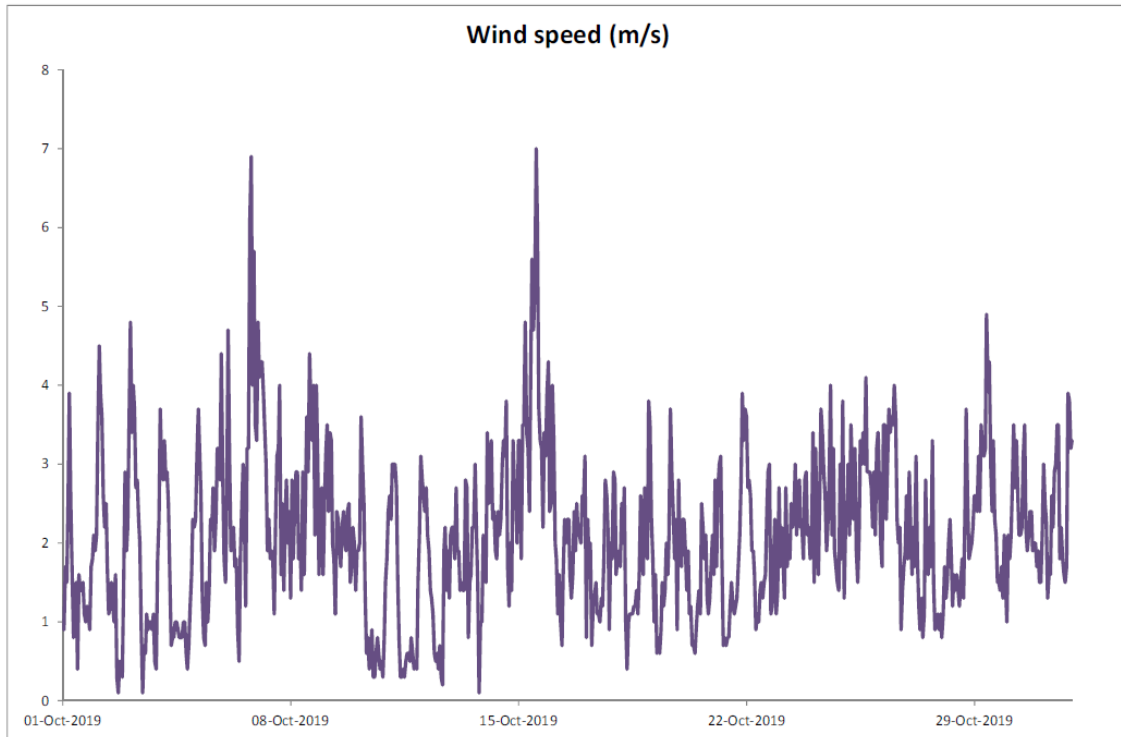
Annex D4

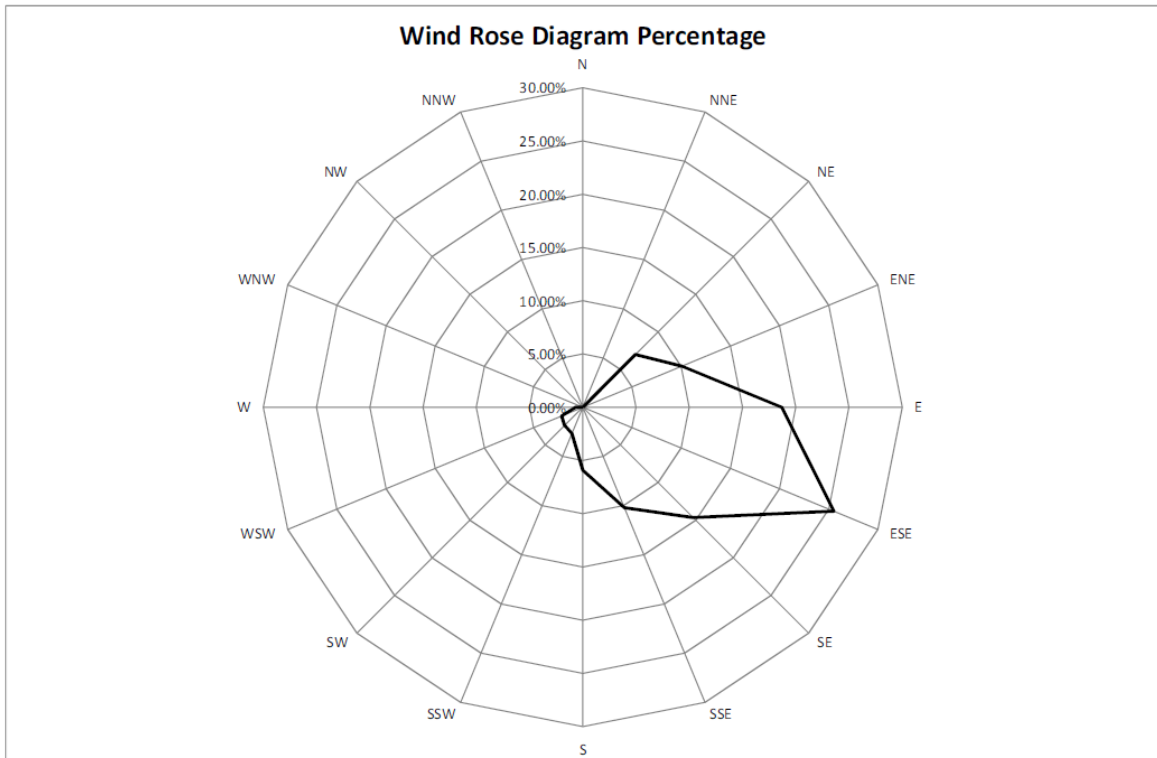
Meteorological Data

Annex D4 Meteorological Data









Manual Rain Gauge Readings

October 2019

| Date | Rainfall (mm) |
|-----------------------|------------------|
| 1/Oct/19 | 0.0 |
| 2/Oct/19 | 0.0 |
| 3/Oct/19 | 0.0 |
| 4/Oct/19 | 0.0 |
| 5/Oct/19 | 0.0 |
| 6/Oct/19 | 25.0 |
| 7/Oct/19 | 0.2 |
| 8/Oct/19 | 0.0 |
| 9/Oct/19 | 0.0 |
| 10/Oct/19 | 0.0 |
| 11/Oct/19 | 0.0 |
| 12/Oct/19 | 18.8 |
| 13/Oct/19 | 33.7 |
| 14/Oct/19 | 16.2 |
| 15/Oct/19 | 0.2 |
| 16/Oct/19 | 0.1 |
| 17/Oct/19 | 7.2 |
| 18/Oct/19 | 0.2 |
| 19/Oct/19 | 7.8 |
| 20/Oct/19 | 0.2 |
| 21/Oct/19 | 0.0 |
| 22/Oct/19 | 0.0 |
| 23/Oct/19 | 0.0 |
| 24/Oct/19 | 0.0 |
| 25/Oct/19 | 0.0 |
| 26/Oct/19 | 0.0 |
| 27/Oct/19 | 0.0 |
| 28/Oct/19 | 0.3 |
| 29/Oct/19 | 0.2 |
| 30/Oct/19 | 0.0 |
| 31/Oct/19 | 0.0 |
| TOTAL RAINFALL | 110.1 |

Annex E

Noise

Annex E1

Calibration Certificates for Noise Monitoring Equipment



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C193753

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098)

Date of Receipt / 收件日期 : 5 July 2019

Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)

Manufacturer / 製造商 : Brüel & Kjær

Model No. / 型號 : 2238

Serial No. / 編號 : 2285762

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

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

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 16 July 2019

TEST RESULTS / 測試結果

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

The results do not exceed manufacturer's specification.

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

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

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

Tested By

測試

:

K P Cheuk
Assistant Engineer

Certified By

核證

:

K C Lee
Engineer

Date of Issue

簽發日期

:

22 July 2019

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

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 — 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C193753

證書編號

- 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.
- Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

| <u>Equipment ID</u> | <u>Description</u> | <u>Certificate No.</u> |
|---------------------|-------------------------------------|------------------------|
| CL280 | 40 MHz Arbitrary Waveform Generator | C190176 |
| CL281 | Multifunction Acoustic Calibrator | CDK1806821 |

- Test procedure : MA101N.

- Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

- 6.1.1.1 Before Self-calibration

| UUT Setting | | | | Applied Value | | UUT Reading (dB) |
|-------------|------------------|---------------------|----------------|---------------|-------------|------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | |
| 50 - 130 | L _{AFP} | A | F | 94.00 | 1 | 94.4 |

- 6.1.1.2 After Self-calibration

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 60651 Type 1 Spec. (dB) |
|-------------|------------------|---------------------|----------------|---------------|-------------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | | |
| 50 - 130 | L _{AFP} | A | F | 94.00 | 1 | 94.1 | ± 0.7 |

- 6.1.2 Linearity

| UUT Setting | | | | Applied Value | | UUT Reading (dB) |
|-------------|------------------|---------------------|----------------|---------------|-------------|------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | |
| 50 - 130 | L _{AFP} | A | F | 94.00 | 1 | 94.1 (Ref.) |
| | | | | 104.00 | | 104.1 |
| | | | | 114.00 | | 114.0 |

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

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

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

Certificate of Calibration

校正證書

Certificate No. : C193753

證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 60651 Type 1 Spec. (dB) |
|-------------|------------------|---------------------|----------------|---------------|-------------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. (kHz) | | |
| 50 - 130 | L _{AFP} | A | F | 94.00 | 1 | 94.1 | Ref. |
| | L _{ASP} | | S | | | 94.1 | ± 0.1 |
| | L _{AIP} | | I | | | 94.2 | ± 0.1 |

6.2.2 Tone Burst Signal (2 kHz)

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 60651 Type 1 Spec. (dB) |
|-------------|--------------------|---------------------|----------------|---------------|----------------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Burst Duration | | |
| 30 - 110 | L _{AFP} | A | F | 106.0 | Continuous | 106.0 | Ref. |
| | L _{AFMax} | | | | 200 ms | 104.9 | -1.0 ± 1.0 |
| | L _{ASP} | | S | | Continuous | 106.0 | Ref. |
| | L _{ASMax} | | | | 500 ms | 102.0 | -4.1 ± 1.0 |

6.3 Frequency Weighting

6.3.1 A-Weighting

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 60651 Type 1 Spec. (dB) |
|-------------|------------------|---------------------|----------------|---------------|----------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. | | |
| 50 - 130 | L _{AFP} | A | F | 94.00 | 31.5 Hz | 55.2 | -39.4 ± 1.5 |
| | | | | | 63 Hz | 68.1 | -26.2 ± 1.5 |
| | | | | | 125 Hz | 78.0 | -16.1 ± 1.0 |
| | | | | | 250 Hz | 85.4 | -8.6 ± 1.0 |
| | | | | | 500 Hz | 90.8 | -3.2 ± 1.0 |
| | | | | | 1 kHz | 94.1 | Ref. |
| | | | | | 2 kHz | 95.3 | +1.2 ± 1.0 |
| | | | | | 4 kHz | 95.1 | +1.0 ± 1.0 |
| | | | | | 8 kHz | 93.0 | -1.1 (+1.5 ; -3.0) |
| | | | | | 12.5 kHz | 89.9 | -4.3 (+3.0 ; -6.0) |

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

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Certificate of Calibration

校正證書

Certificate No. : C193753
證書編號

6.3.2 C-Weighting

| UUT Setting | | | | Applied Value | | UUT Reading (dB) | IEC 60651 Type 1 Spec. (dB) |
|-------------|------------------|---------------------|----------------|---------------|----------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Time Weighting | Level (dB) | Freq. | | |
| 50 - 130 | L _{CFP} | C | F | 94.00 | 31.5 Hz | 91.5 | -3.0 ± 1.5 |
| | | | | | 63 Hz | 93.4 | -0.8 ± 1.5 |
| | | | | | 125 Hz | 93.9 | -0.2 ± 1.0 |
| | | | | | 250 Hz | 94.1 | 0.0 ± 1.0 |
| | | | | | 500 Hz | 94.1 | 0.0 ± 1.0 |
| | | | | | 1 kHz | 94.1 | Ref. |
| | | | | | 2 kHz | 93.9 | -0.2 ± 1.0 |
| | | | | | 4 kHz | 93.3 | -0.8 ± 1.0 |
| | | | | | 8 kHz | 91.1 | -3.0 (+1.5 ; -3.0) |
| | | | | | 12.5 kHz | 88.0 | -6.2 (+3.0 ; -6.0) |

6.4 Time Averaging

| UUT Setting | | | | Applied Value | | | | | UUT Reading (dB) | IEC 60804 Type 1 Spec. (dB) |
|-------------|------------------|---------------------|------------------|-----------------|---------------------|-------------------|------------------|-----------------------|------------------|-----------------------------|
| Range (dB) | Parameter | Frequency Weighting | Integrating Time | Frequency (kHz) | Burst Duration (ms) | Burst Duty Factor | Burst Level (dB) | Equivalent Level (dB) | | |
| 30 - 110 | L _{Aeq} | A | 10 sec. | 4 | 1 | 1/10 | 110.0 | 100 | 100.0 | ± 0.5 |
| | | | 60 sec. | | | 1/10 ² | | 90 | 90.0 | ± 0.5 |
| | | | 5 min. | | | 1/10 ³ | | 80 | 79.2 | ± 1.0 |
| | | | | | | 1/10 ⁴ | | 70 | 69.2 | ± 1.0 |

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2658547
 - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1
 - Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
 250 Hz - 500 Hz : ± 0.30 dB
 1 kHz : ± 0.20 dB
 2 kHz - 4 kHz : ± 0.35 dB
 8 kHz : ± 0.45 dB
 12.5 kHz : ± 0.70 dB
 104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
 114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
 Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

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

Note :

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

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

The test equipment used for calibration are traceable to the Nation 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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輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C186448

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-0867) Date of Receipt / 收件日期 : 8 November 2018

Description / 儀器名稱 : Sound Calibrator (EQ089)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-75
Serial No. / 編號 : 34680623
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 24 November 2018

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

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

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

Tested By : 
測試 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 27 November 2018
簽發日期

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

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 — 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C186448

證書編號

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

| <u>Equipment ID</u> | <u>Description</u> | <u>Certificate No.</u> |
|---------------------|-----------------------------------|------------------------|
| CL130 | Universal Counter | C183775 |
| CL281 | Multifunction Acoustic Calibrator | CDK1806821 |
| TST150A | Measuring Amplifier | C181288 |

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

| UUT Nominal Value | Measured Value (dB) | Mfr's Spec. (dB) | Uncertainty of Measured Value (dB) |
|----------------------|------------------------|---------------------|---------------------------------------|
| 94 dB, 1 kHz | 94.0 | ± 0.25 | ± 0.2 |

5.2 Frequency Accuracy

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

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

Note :

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

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

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

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 — 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Annex E2

Noise Monitoring Results

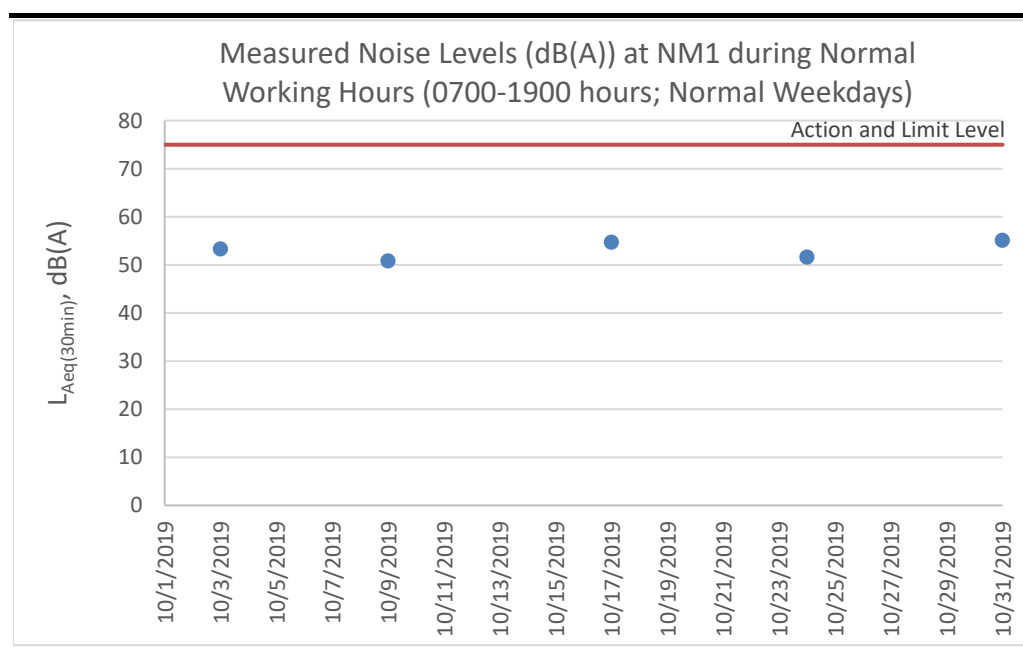
Table E2.1 Measured Noise Levels (dB(A)) at NM1 during Normal Working Hours (0700-1900 hours; Normal Weekdays)

| Date | Start Time | Finish Time | Weather | L ₁₀ (30min) | L ₉₀ (30min) | L _{eq} (30min) |
|-----------|------------|-------------|---------|-------------------------|-------------------------|-------------------------|
| 3 Oct 19 | 15:00 | 15:30 | Sunny | 54.5 | 51.5 | 53.3 |
| 9 Oct 19 | 15:12 | 15:42 | Sunny | 52.5 | 48.5 | 50.8 |
| 17 Oct 19 | 15:05 | 15:35 | Sunny | 57.0 | 50.5 | 54.7 |
| 24 Oct 19 | 14:39 | 15:09 | Sunny | 53.0 | 48.5 | 51.6 |
| 31 Oct 19 | 14:37 | 15:07 | Sunny | 57.5 | 50.5 | 55.1 |
| | | | | | | Average 53.1 |
| | | | | | | Min 50.8 |
| | | | | | | Max 55.1 |

Note:

Correction of +3 dB(A) was made for free field measurements.

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 Construction Noise*

| Event | Action | | |
|---|--|--|------------|
| | ET | IEC | Contractor |
| <p>Action Level</p> <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Submit proposals for remedial measures to IEC Implement the agreed proposals | |
| <p>Limit Level</p> <ul style="list-style-type: none"> 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 Contractor, IEC, Project Proponent and EPD Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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

Surface Water Quality

Annex F1

Calibration Certificates for
Surface Water Quality
Monitoring Equipment



REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

| | | | |
|----------|--|----------------|-------------|
| CONTACT: | MR BEN TAM | WORK ORDER: | HK1936450 |
| CLIENT: | ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING | | |
| ADDRESS: | RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG | SUB-BATCH: | 0 |
| | | LABORATORY: | HONG KONG |
| | | DATE RECEIVED: | 26-Aug-2019 |
| | | DATE OF ISSUE: | 02-Sep-2019 |

COMMENTS

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

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

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

| | |
|----------------------------|---|
| Scope of Test: | Conductivity, Dissolved Oxygen, pH Value, Turbidity, Salinity and Temperature |
| Equipment Type: | Multifunctional Meter |
| Brand Name/ Model No.: | YSI Professional DSS |
| Serial No./ Equipment No.: | 15H102620/ 15H103928 (EQW018) |
| Date of Calibration: | 30-Aug-2019 |

NOTES

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

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

Mr Chan Siu Ming, Vico
Manager - Inorganic

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK1936450
 SUB-BATCH: 0
 DATE OF ISSUE: 02-Sep-2019
 CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Multifunctional Meter
 Brand Name/ Model No.: YSI Professional DSS
 Serial No./ Equipment No.: 15H102620/ 15H103928 (EQW018)
 Date of Calibration: 30-Aug-2019 Date of Next Calibration: 30-Nov-2019

PARAMETERS:

Conductivity Method Ref: APHA (21st edition), 2510B

| Expected Reading ($\mu\text{S}/\text{cm}$) | Displayed Reading ($\mu\text{S}/\text{cm}$) | Tolerance (%) |
|--|---|---------------|
| 146.9 | 160.7 | +9.4 |
| 6667 | 6485 | -2.7 |
| 12890 | 12380 | -4.0 |
| 58670 | 55669 | -5.1 |
| | Tolerance Limit (%) | ± 10.0 |

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

| Expected Reading (mg/L) | Displayed Reading (mg/L) | Tolerance (mg/L) |
|-------------------------|--------------------------|------------------|
| 7.43 | 7.41 | -0.02 |
| 4.06 | 4.07 | +0.01 |
| 2.05 | 2.20 | +0.15 |
| | Tolerance Limit (mg/L) | ± 0.20 |

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

| Expected Reading (pH unit) | Displayed Reading (pH unit) | Tolerance (pH unit) |
|----------------------------|-----------------------------|---------------------|
| 4.0 | 4.15 | +0.15 |
| 7.0 | 7.07 | +0.07 |
| 10.0 | 9.90 | -0.10 |
| | 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.

Mr Chan Siu Ming, Vico
 Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK1936450
 SUB-BATCH: 0
 DATE OF ISSUE: 02-Sep-2019
 CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Multifunctional Meter
 Brand Name/ Model No.: YSI Professional DSS
 Serial No./ Equipment No.: 15H102620/ 15H103928 (EQW018)
 Date of Calibration: 30-Aug-2019 Date of Next Calibration: 30-Nov-2019

PARAMETERS:

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

| Expected Reading (NTU) | Displayed Reading (NTU) | Tolerance (%) |
|------------------------|-------------------------|---------------|
| 0 | 0.02 | -- |
| 4 | 3.76 | -6.0 |
| 40 | 37.23 | -6.9 |
| 80 | 73.56 | -8.1 |
| 400 | 401.38 | +0.3 |
| 800 | 780.12 | -2.5 |
| | Tolerance Limit (%) | ±10.0 |

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

| Expected Reading (ppt) | Displayed Reading (ppt) | Tolerance (%) |
|------------------------|-------------------------|---------------|
| 0 | 0.00 | -- |
| 10 | 10.30 | +3.0 |
| 20 | 20.32 | +1.6 |
| 30 | 31.32 | +4.4 |
| | Tolerance Limit (%) | ±10.0 |

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

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK1936450
SUB-BATCH: 0
DATE OF ISSUE: 02-Sep-2019
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Multifunctional Meter
Brand Name/ Model No.: YSI Professional DSS
Serial No./ Equipment No.: 15H102620/ 15H103928 (EQW018)
Date of Calibration: 30-Aug-2019 Date of Next Calibration: 30-Nov-2019

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) |
|-----------------------|------------------------|----------------|
| 10.0 | 9.9 | -0.1 |
| 20.0 | 18.9 | -1.1 |
| 38.0 | 36.4 | -1.6 |
| | Tolerance Limit (°C) | ±2.0 |

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

Mr Chan Siu Ming, Vico
Manager - Inorganic

Annex F2

Surface Water Quality Monitoring Results

Table F2.1 Surface Water Quality Monitoring Results at DP4T

| Date | Time | Weather Condition | Water Appearance | Water Condition | Water Temperature (°C) | Dissolved Oxygen (DO) (mg/L) | pH | Suspended Solids (SS) (mg/L) | Remarks |
|----------------|-------|-------------------|------------------|---|------------------------|------------------------------|------|------------------------------|-------------------------------------|
| 3 Oct 19 | 14:31 | Sunny | Light yellow | Clear | 29.7 | 8.12 | 7.92 | 6.2 | - |
| 3 Oct 19 | 14:40 | Sunny | Light yellow | Clear | 29.9 | 7.94 | 7.79 | 7.1 | DP4 (Future, temporary) (Duplicate) |
| 9 Oct 19 | 14:54 | Sunny | Colourless | Clear | 29.5 | 6.99 | 7.68 | 9.5 | - |
| 17 Oct 19 | 14:48 | Sunny | Colourless | Clear | 27.2 | 7.74 | 7.92 | 6.4 | - |
| 24 Oct 19 | 14:25 | Sunny | | Unable to collect water sample due to insufficient flow | | | | | |
| 31 Oct 19 | 14:26 | Sunny | | Unable to collect water sample due to insufficient flow | | | | | |
| Average | | | | | | 7.70 | 7.83 | 7.3 | - |
| Min | | | | | | 6.99 | 7.68 | 6.2 | - |
| Max | | | | | | 8.12 | 7.92 | 9.5 | - |

Notes: DP4 was temporary relocated to DP4 (Future, temporary) (i.e. DP4T) as an interim discharge point from the monitoring event on 16 May 2019.

Table F2.2 Surface Water Quality Monitoring Results at DP6

| Date | Time | Weather Condition | Water Appearance | Water Condition | Water Temperature (°C) | Dissolved Oxygen (DO) (mg/L) | pH | Suspended Solids (SS) (mg/L) | Remarks |
|----------------|-------|-------------------|------------------|---|------------------------|------------------------------|------|------------------------------|-----------------|
| 3 Oct 19 | 14:20 | Sunny | | Unable to collect water sample due to insufficient flow | | | | | |
| 9 Oct 19 | 14:27 | Sunny | Colourless | Clear | 30.0 | 7.64 | 7.70 | 4.2 | - |
| 9 Oct 19 | 14:37 | Sunny | Colourless | Clear | 29.9 | 7.59 | 7.64 | 4.0 | DP6 (Duplicate) |
| 17 Oct 19 | 14:23 | Sunny | Colourless | Clear | 27.8 | 7.72 | 7.99 | 6.0 | - |
| 17 Oct 19 | 14:31 | Sunny | Colourless | Clear | 27.5 | 7.78 | 7.84 | 6.5 | DP6 (Duplicate) |
| 24 Oct 19 | 14:18 | Sunny | | Unable to collect water sample due to insufficient flow | | | | | |
| 31 Oct 19 | 14:18 | Sunny | | Unable to collect water sample due to insufficient flow | | | | | |
| Average | | | | | | 7.68 | 7.79 | 5.2 | - |
| Min | | | | | | 7.59 | 7.64 | 4.0 | - |
| Max | | | | | | 7.78 | 7.99 | 6.5 | - |

Figure F2.1 Graphical Presentation for Surface Water Quality Monitoring (DO)

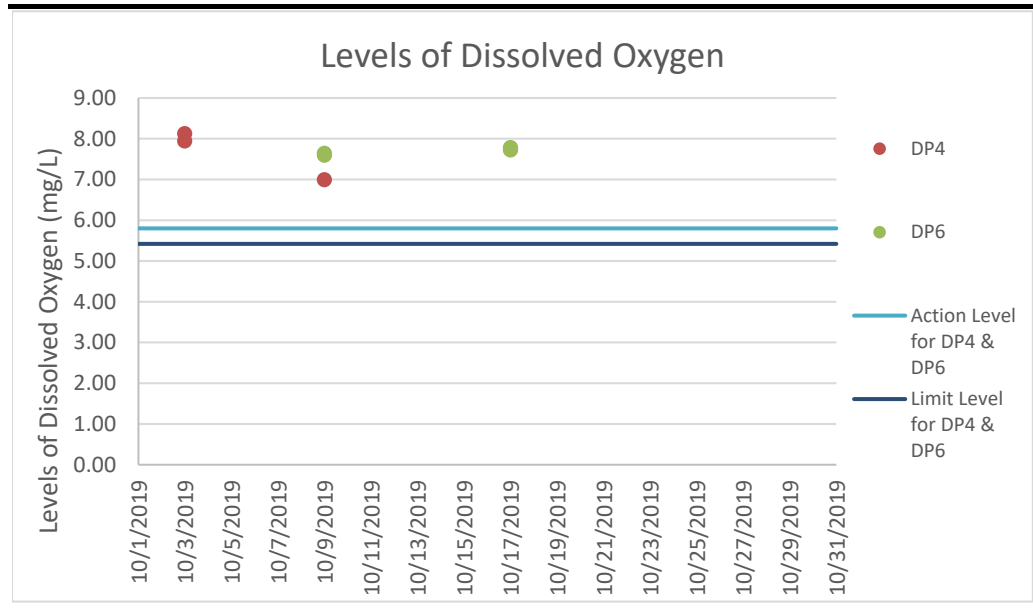


Figure F2.2 Graphical Presentation for Surface Water Quality Monitoring (pH)

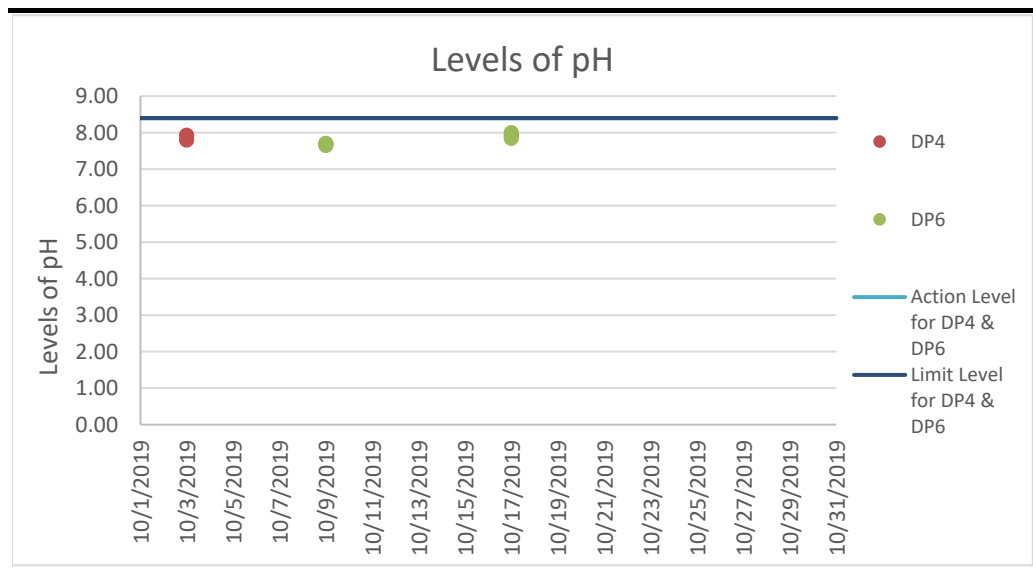
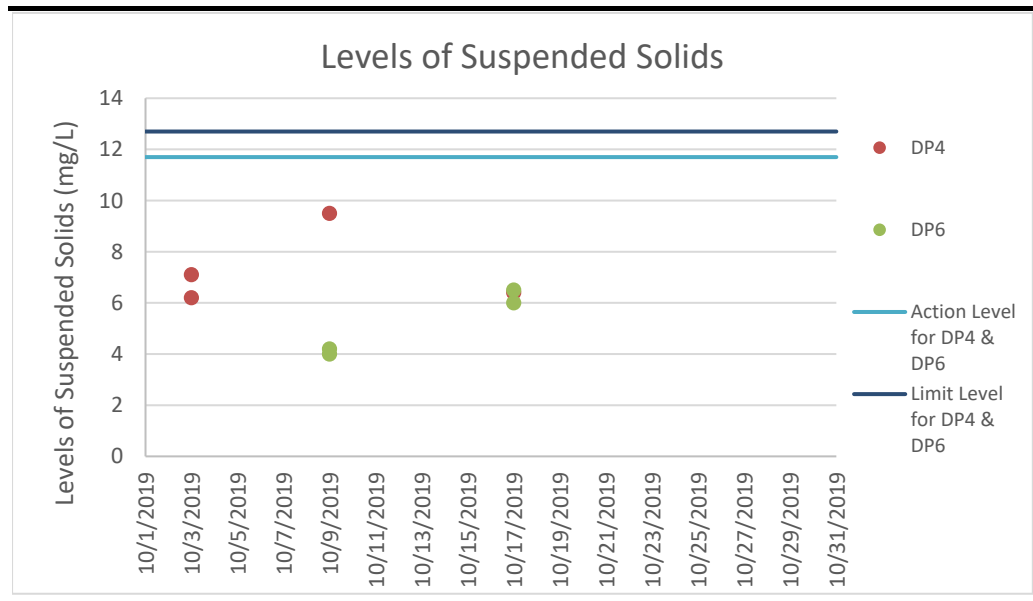


Figure F2.3 Graphical Presentation for Surface Water Quality Monitoring (SS)



Annex F3

Event and Action Plan for Surface Water Quality Monitoring

Annex F3 **Event and Action Plan for Surface Water Quality During Construction Phase**

| Event | Action | | |
|--|--|---|--|
| | ET | IEC | Contractor |
| Action Level being exceeded by one sampling day | <ul style="list-style-type: none"> Repeat <i>in situ</i> measurement to confirm findings Identify the source(s) and investigate the cause(s) of exceedance Prepare Notification of Exceedance within 24 hours Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project Repeat measurement on the next day of exceedance if exceedance is due to the Project | <ul style="list-style-type: none"> Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods | <ul style="list-style-type: none"> Rectify any unacceptable practice Amend working methods if appropriate |
| Action Level being exceeded by two consecutive sampling days | <ul style="list-style-type: none"> Repeat <i>in situ</i> measurement to confirm findings Identify the source(s) and investigate the cause(s) of exceedance 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 Increase the monitoring frequency to daily if exceedance is due to the Project and continue until no exceedance of Action Level | <ul style="list-style-type: none"> Verify the Notification of Exceedance Check monitoring data submitted by ET Check Contractor's working methods Discuss with ET Leader 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 | <ul style="list-style-type: none"> Submit proposals for remedial measures to IEC Implement the agreed proposals Amend proposal if appropriate |

| Event | Action | | |
|---|---|--|---|
| | ET | IEC | Contractor |
| Limit Level being exceeded by two consecutive sampling days | <ul style="list-style-type: none"> Repeat <i>in situ</i> measurement to confirm findings Identify source(s) of impact and cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD 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 until no exceedance of Limit Level | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Critically review the working methods Rectify unacceptable practice Check all plant and equipment Consider changes of working methods Discuss with the ET and IEC and propose mitigation measures to the IEC Implement the agreed mitigation measures |
| Limit Level being exceeded by more than two consecutive sampling days | <ul style="list-style-type: none"> Repeat <i>in situ</i> measurement to confirm findings Identify source(s) of impact and cause(s) of exceedance Prepare the Notification of Exceedance within 24 hours Inform Contractor, IEC, Project Proponent and EPD whether the cause of exceedance is due to the Project Check monitoring data, all plant, equipment and Contractor's working methods Discuss with Contractor and IEC for remedial measures required Ensure mitigation measures are implemented Increase the monitoring frequency to daily if exceedance is due to the Project until no exceedance of Limit Level for two consecutive days | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Critically review the working methods Rectify unacceptable practice Check all plant and equipment Consider changes of working methods Discuss with the ET and IEC and propose mitigation measures Implement the agreed mitigation measures As directed by the Project Proponent, slow down or stop all or part of the construction activities |

Annex G

Cumulative Statistics on
Exceedances,
Environmental Complaints,
Notification of Summons
and Status of Prosecutions

Table G1 *Cumulative Statistics on Exceedances*

| | | Total No. recorded in this reporting period | Total No. recorded since project commencement |
|-------------------------|--------|--|---|
| Air Quality (24-hr TSP) | Action | 0 | 0 |
| | Limit | 0 | 0 |
| Noise | Action | 0 | 0 |
| | Limit | 0 | 0 |
| Surface Water Quality | Action | 0 | 0 |
| | Limit | 0 | 32 |

Table G2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

| Reporting Period | Cumulative Statistics | | |
|--|-----------------------|--------------------------|--------------|
| | Complaints | Notifications of Summons | Prosecutions |
| This Reporting Period (1 - 31 October 2019) | 0 | 0 | 0 |
| Total no. received since project commencement | 1 | 0 | 0 |

Annex H

Monitoring Schedule for the Next Reporting Period

**South East New Territories (SENT) Landfill Extension
EM&A Impact Monitoring Schedule during Construction Phase**

November 2019

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----------------------|-----------------------|-----------------------|----------------------|--|-----|-----------------------|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 Dust Monitoring | 7 Surface Water Monitoring (pm) Noise Monitoring (pm) | 8 | 9 |
| 10 | 11 | 12 Dust Monitoring | 13 | 14 Surface Water Monitoring (pm) Noise Monitoring (pm) | 15 | 16 |
| 17 | 18 Dust Monitoring | 19 | 20 | 21 Surface Water Monitoring (pm) Noise Monitoring (pm) | 22 | 23 |
| 24 Dust Monitoring | 25 | 26 | 27 | 28 Surface Water Monitoring (pm) Noise Monitoring (pm) | 29 | 30 Dust Monitoring |

Note:
Impact dust monitoring will be conducted at two monitoring stations (DM1 and DM2) under the on-going EM&A programme TKO Area 137 Fill Bank and the results will be shared with SENTX.