



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

## South East New Territories (SENT) Landfill Extension

### Quarterly Environmental Monitoring & Audit Report No.4

April 2020

#### ERM

2507, 25/F  
One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
T: 2271 3000  
F: 2723 5660  
[www.erm.com](http://www.erm.com)





翠谷工程有限公司  
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:	Quarterly Environmental Monitoring & Audit Report No.4 for South East New Territories (SENT) Landfill Extension
Date of Report:	28 April 2020

#### Reference EM&A Manual Requirement

EM&A Manual:	Section 11.4
The quarterly EM&A summary report shall be prepared by the ET, certified by the ET Leader and verified by the IEC. The quarterly EM&A summary report should contain all information listed under Section 11.4 of the approved EM&A Manual.	

#### ET Certification

I hereby certify that the above referenced document/ plan complies with the above referenced EM&A Manual requirement.

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 EM&A Manual requirement.

W.K. Chiu,  
Independent Environmental Checker:  
(Meinhardt Infrastructure and  
Environment Limited)

Date:




4 May 2020

# South East New Territories (SENT) Landfill Extension

## Quarterly Environmental Monitoring & Audit Report No.4

### Environmental Resources Management

2507, 25/F, One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660  
E-mail: post.hk@erm.com  
http://www.erm.com

Client:  Green Valley Landfill Ltd.		Project No:  0465169			
Summary:  This document presents the Quarterly EM&A Report No.4 for <i>South East New Territories (SENT) Landfill Extension</i>		Date: 28 April 2020			
		Approved by:   Frank Wan Partner			
1	Quarterly EM&A Report No.4 (Annex G revised)	AL	FW	FW	28 Apr 20
0	Quarterly EM&A Report No.4	AL	FW	FW	13 Jan 20
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

	<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
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	5
1.7	STATUS OF STATUTORY ENVIRONMENTAL COMPLIANCE WITH THE ENVIRONMENTAL PERMIT	7
1.8	STATUS OF OTHER STATUTORY ENVIRONMENTAL REQUIREMENTS	7
<b>2</b>	<b>EM&amp;A RESULTS</b>	<b>9</b>
2.1	AIR QUALITY MONITORING	9
2.2	NOISE MONITORING	11
2.3	SURFACE WATER QUALITY MONITORING	12
2.4	LANDSCAPE AND VISUAL MONITORING	14
2.5	EM&A SITE INSPECTION	15
2.6	WASTE MANAGEMENT STATUS	18
2.7	IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES	19
2.8	SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT	19
2.9	SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS	19
<b>3</b>	<b>CONCLUSION AND RECOMMENDATION</b>	<b>20</b>

**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 24-HOUR TSP MONITORING RESULTS**

**ANNEX D2 EVENT AND ACTION PLAN FOR DUST MONITORING**

**ANNEX D3 METEOROLOGICAL DATA**

**ANNEX E NOISE**

**ANNEX E1 NOISE MONITORING RESULTS**

**ANNEX E2 EVENT AND ACTION PLAN FOR NOISE MONITORING**

**ANNEX F SURFACE WATER QUALITY**

**ANNEX F1 SURFACE WATER QUALITY MONITORING RESULTS**

**ANNEX F2 EVENT AND ACTION PLAN FOR SURFACE WATER QUALITY MONITORING**

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

## **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 Quarterly EM&A report presents the EM&A works carried out during the period from 1 October to 31 December 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. Impact surface water quality monitoring could not be carried out on 3 October 2019 at DP6 and on 24 and 31 October 2019 and in November and December 2019 at all monitoring locations due to insufficient flow.

### **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.

# 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 <sup>(1)</sup>, approved EIA Report <sup>(2)</sup> 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 Mm<sup>3</sup> 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*

<b>Key Stage of the Project</b>	<b>Indicative Date</b>
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.

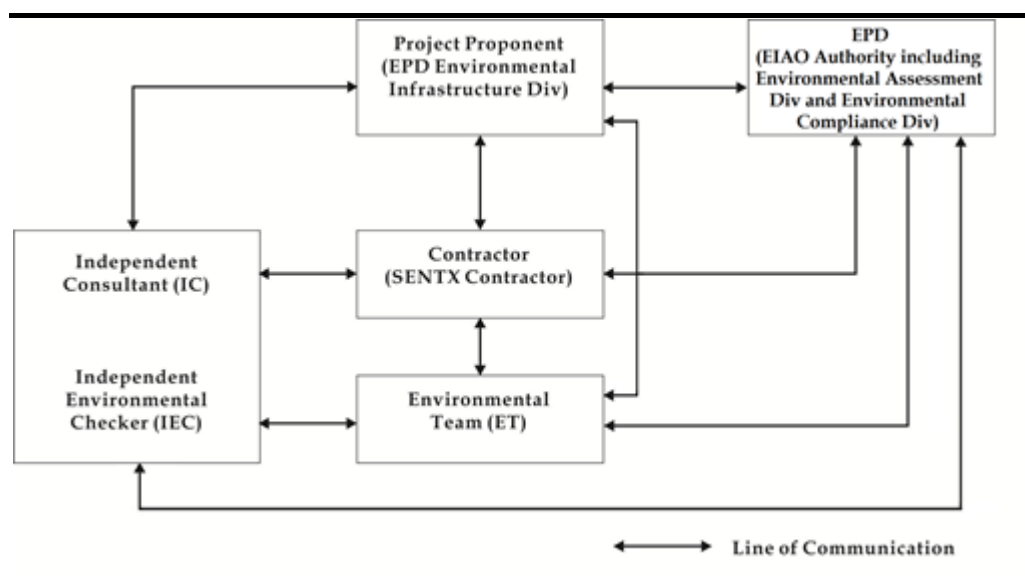
### **1.3** *SCOPE OF THE EM&A REPORT*

This is the Quarterly EM&A Report for the Project which summarises the key findings of the EM&A programme during the reporting period from 1 October to 31 December 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 summarized 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
	Complaint Hotline		2706 8682
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:

### October 2019

- 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.

#### November 2019

- Rebar fixing, concreting and formwork erection for the plinth and the fit-out work for the control building of Landfill Gas Plant area and placing of landfill gas generator;
- Excavating, removing and replacing unsuitable fill materials;
- Sediment trap remedial works;
- Construction of drop inlet shaft and last bay of outlet box culvert;
- Rebar fixing, formwork and concreting to the plinth of tanks at Leachate Treatment Plant (LTP) and construction of superstructure of Bioplant buildings;
- Rebar, formwork and concreting to the substructure of infrastructure buildings (EPD, GVL and laboratory buildings);
- Backfilling works around the raft foundation of maintenance building;
- Installation of ammonia stripping plant, equalization tank, sequencing batch reactor tank and treated effluent tank 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 from East to West in Cell 2X;
- CLP trench works;
- Liner installation at Cell 1X; and
- Construction of X9B channel.

December 2019

- Building services and fitting-out works for control building of Landfill Gas Plant;
- Road paving of Landfill Gas Plant;
- Flares and cooling towers installation of Landfill Gas Plant;
- Excavating, removing and replacing unsuitable fill materials;
- Construction of base slab of outlet box culvert of bay F2;
- Rebar fixing, formwork and concreting to the superstructure of laboratory building, GVL building and EPD building;
- Rebar fixing, formwork and concreting to the on-grade slab and roof slab of biopant;
- Installation of ammonia stripping plant, equalization tank, sequencing batch reactor tank and treated effluent tank at Leachate Treatment Plant (LTP) area;
- Construction of perimeter bund for Cell 2X;
- Maintenance and improvement of the temporary surface water drainage;
- Shotcreting and mass concrete for Buttress Wall;
- Installing groundwater pipe works from South to North in Cell 3X;
- Liner installation at Cell 1X and 2X;
- Construction of perimeter bund channel; and
- Construction of pits and ducting for underground utilities in Area X1 and X2.

The implementation schedule of the mitigation measures 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	



<b>Parameters</b>	<b>Status</b>
Baseline Monitoring	The results of baseline air quality monitoring were reported in <i>Baseline Monitoring Report</i> and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
<b>Noise</b>	
Baseline Monitoring	The results of baseline noise monitoring were reported in <i>Baseline Monitoring Report</i> and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
<b>Surface Water Quality</b>	
Baseline Monitoring	The results of baseline surface water quality monitoring were reported in <i>Baseline Monitoring Report</i> and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
<b>Waste Management</b>	
Waste Monitoring	On-going
<b>Landscape and Visual</b>	
Baseline Monitoring	The results of baseline landscape and visual monitoring were reported in <i>Baseline Monitoring Report</i> and submitted to EPD under EP Condition 3.3
Construction Phase Audit	On-going
<b>Site Environmental Audit</b>	
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:

- Three environmental management meetings were held with the Contractor, ER, ET, IEC and EPD on 16 October, 13 November and 19 December 2019; and
- Environmental toolbox trainings on the following topics were provided by the Contractor to the workers:
  - Tree Protection on 15 October 2019;
  - Renewable Energy on 31 October 2019;
  - Waste Reduction in Construction Industry on 7 November 2019;
  - Good Practice of Wastewater Management in Construction Sites on 26 November 2019;

- Chemical Waste Handling on 10 December 2019; and
- Vehicle Maintenance Practices on 16 December 2019.

## 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 the recommended mitigation measures are presented in *Table 1.4*.

**Table 1.4** *Status of Submissions required under the EP and Implementation Status of the recommended 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

<b>Description</b>	<b>Ref No.</b>	<b>Status</b>
Registration as a Chemical Waste Producer (Permit Holder: REC)	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 (cancelled with effect from 16 December 2019 at 07:00 hrs)
	GW-RE1001-19	Validity from 16 December 2019 to 10 June 2020
Construction Noise Permit (Permit Holder: REC)	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. It is proposed and agreed by IEC and EPD that the two existing TSP monitoring stations (i.e. TKO-A1 and TKO-A2a) currently operating by the Civil Engineering and Development Department (CEDD) can be used to monitor the 24-hour TSP impact associated with the SENTX construction. The dust monitoring results were obtained from CEDD on regular basis.

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.



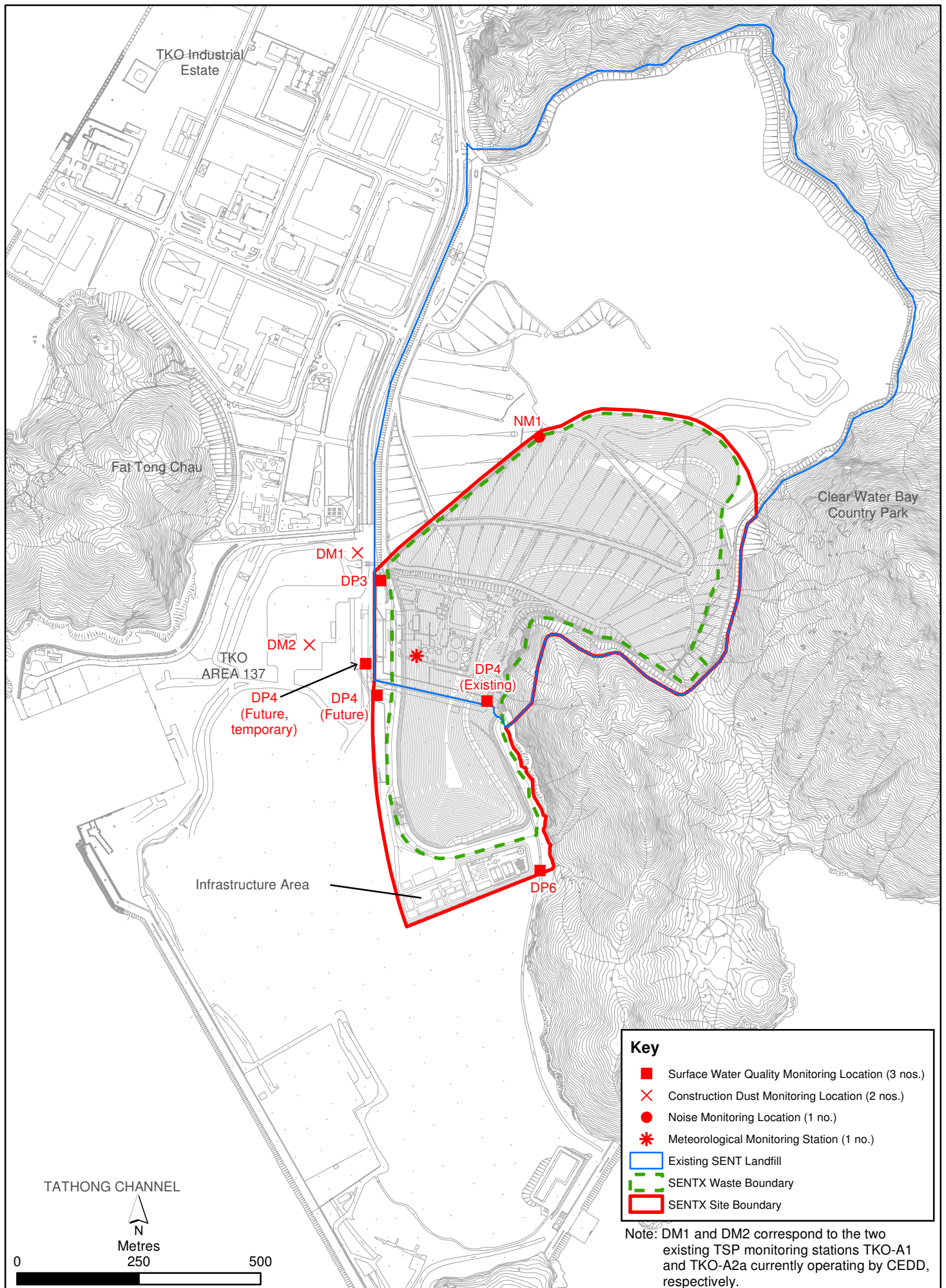


Figure 2.1

Environmental Impact Monitoring Locations

**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 construction phase of the Project	1, 7, 13, 19, 25, 31 October 2019	HVS Greasby 105 (S/N: 9795 (ET/EA/003/18))
DM2	Combined Reception and Exit Office (CREO) of TKO Area 137 Fill Bank			6, 12, 18, 24, 30 November 2019 6, 12, 18, 24, 30 December 2019	HVS Andersen G1051 (S/N: 1176 (ET/EA/003/05))

**2.1.2 Monitoring Schedule for the Reporting Period**

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

**2.1.3 Results and Observations**

The 24-hour TSP monitoring results are summarised in *Table 2.3*. The detailed monitoring results and the graphical presentation of the 24-hour TSP monitoring results at each monitoring location are provided in *Annex D1*.

**Table 2.3 Summary of 24-hour TSP Monitoring Results in the Reporting Period**

Month	Monitoring Station	24-hr TSP Concentration ( $\mu\text{g m}^{-3}$ )		Action Level ( $\mu\text{g/m}^3$ )	Limit Level ( $\mu\text{g/m}^3$ )
		Average	Range		
October 2019	DM-1	91	80 - 102	204	260
	DM-2	90	87 - 97	193	260
November 2019	DM-1	95	84 - 106	204	260
	DM-2	100	88 - 106	193	260
December 2019	DM-1	108	92 - 116	204	260
	DM-2	93	80 - 102	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 measured at the two monitoring stations were below the Action and Limit Levels in the reporting period. No additional measure is thus required in accordance with the Event and Action Plan presented in *Annex D2*.

**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 D3*. The meteorological station will be moved to a new location at SENTX infrastructure area as per the updated EM&A Manual after the construction of the new infrastructure area is completed. For the purpose of this EM&A programme, it is considered that

meteorological data obtained at the existing SENT landfill meteorological monitoring station are representative of the Project area and could be used for the interpretation of the construction phase dust monitoring results.

## 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
<b>Notes:</b>		
(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 a sound level meter placed 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*.

**Table 2.5 Noise Monitoring Details**

Monitoring Station <sup>(1)</sup>	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
NM1	SENTX Site Boundary (North)	L <sub>eq</sub> (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 7, 15, 21, 28 November 2019 5, 12, 18, 27 December 2019	Sound Level Meter: B&K 2238 (S/N: 2285762)  Acoustic Calibrator: Rion NC-75 (S/N: 34680623)  Rion NC-74 (S/N: 34657231)

**2.2.2 Monitoring Schedule for the Reporting Period**

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

**2.2.3 Results and Observations**

A total of 13 impact noise monitoring events were scheduled during the reporting period. However, monitoring was not conducted on 5 December 2019 due to adverse weather condition. The noise monitoring results are summarised in *Table 2.6* and graphically presented in *Annex E1*.

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

Month	Monitoring Station	Measured Noise Level L <sub>eq</sub> (30 min), dB(A)		
		Average	Range	Action and Limit Level
October 2019	NM1	53.1	50.8 - 55.1	75
November 2019	NM1	54.0	52.1 - 57.0	75
December 2019	NM1	51.9	51.6 - 52.3	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 exceedance of the Action and Limit Levels for construction noise monitoring was recorded in the reporting period. No further mitigation measure was required in accordance with the Event and Action Plan presented in *Annex E2*.

**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. Impact 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
	<b>DP4 &amp; DP6</b>	
DO	< 5.80 mg/L	< 5.42 mg/L
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*.

**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 7, 15, 21, 28 November 2019	•pH •DO •SS	YSI Professional DSS (S/N: 15H102620)
DP6	Surface water discharge point DP6		5, 12, 18, 27 December 2019		YSI Professional DSS (S/N: 17B102764)

**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 Period**

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 13 monitoring events for impact surface water quality monitoring were scheduled at all designated monitoring stations during the reporting period. However, sampling could not be carried out on 3 October 2019 at DP6 and on 24 and 31 October 2019 and in November and December 2019 at all monitoring locations due to insufficient flow. Impact water quality monitoring results and graphical presentations are provided in *Annex F1*.

No exceedances of the Action and Limit Levels were recorded for impact surface water quality monitoring in the reporting period and no action is thus required to be undertaken in accordance with the Event and Action Plan presented in *Annex F2*.

**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, 26 November and 30 December 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 maintain the advance screen planting works as soon as possible to ensure effective screening of views of project works from the High Junk Peak Trail. The Contractor has considered 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, 13 site inspections were carried out on 3, 10, 16, 24 and 31 October, 7, 13, 21 and 28 November and 5, 12, 19, 24 and 31 December 2019.

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

**Table 2.9** *Key Observations Identified during the Site Inspections in this Reporting Period*

<b>Inspection Date</b>	<b>Environmental Observations and Recommendations</b>
3 October 2019	<ul style="list-style-type: none"> <li>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.</li> <li>The Contractor shall clear the general refuse near future EPD building.</li> <li>The Contractor shall dispose of the waste accumulated in the refuse skip near DP6 regularly to minimize odour and pest issues.</li> </ul>
10 October 2019	<ul style="list-style-type: none"> <li>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.</li> <li>The Contractor shall clear the general refuse near future bioplant building and dispose of the waste accumulated regularly.</li> </ul>
16 October 2019	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ul>
24 October 2019	<ul style="list-style-type: none"> <li>The Contractor shall clear the oil spillage near buttress wall and handle the clean-up materials as chemical waste.</li> </ul>

<b>Inspection Date</b>	<b>Environmental Observations and Recommendations</b>
31 October 2019	<ul style="list-style-type: none"> <li>• The Contractor shall clear the oil spillage in the future laboratory building and handle the clean-up materials as chemical waste.</li> <li>• 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.</li> <li>• The Contractor shall collect general refuse in enclosed bins separately from recyclables and chemical waste near DP4T Wetsep and DP6.</li> </ul>
7 November 2019	<ul style="list-style-type: none"> <li>• -</li> </ul>
13 November 2019	<ul style="list-style-type: none"> <li>• The Contractor shall clear and dispose of the general refuse at DP4T channel to reduce pest and odour issues.</li> <li>• The Contractor shall replace the NRMM labels on the roller and excavator near DP4T to ensure all NRMM labels displayed on site are clearly visible and in correct size as specified in the APCO.</li> </ul>
21 November 2019	<ul style="list-style-type: none"> <li>• The Contractor shall enhance watering to the site, especially around areas with loading and unloading activities.</li> <li>• The Contractor shall clear the oil spillage at the roller near DP4T and handle the clean-up materials as chemical waste.</li> <li>• The Contractor shall avoid accumulation of liquid in the drip tray near buttress wall and shall treat the clean-up materials as chemical waste.</li> <li>• The Contractor shall store the general refuse near sediment trap properly in a refuse skip and dispose of the waste regularly to reduce pest and odour issues.</li> </ul>
28 November 2019	<ul style="list-style-type: none"> <li>• The Contractor shall increase watering frequency and enhance watering to the site, especially to the main haul road and around works areas in Cell 2X.</li> <li>• The Contractor shall avoid accumulation of stagnant water and remove the waste disposed at X9B culvert.</li> <li>• The Contractor shall dispose of the chemical waste in the refuse skip near buttress wall separately in the chemical waste cabinet.</li> <li>• The Contractor shall dispose of the general refuse accumulated near EPD building and bioplant building regularly to reduce odour and pest issues.</li> </ul>
5 December 2019	<ul style="list-style-type: none"> <li>• The Contractor shall maintain the silt fencing along the DP3 channel to minimize SS runoff to the channel.</li> <li>• The Contractor shall provide drip trays for the chemicals placed near X9B culvert and LTP.</li> <li>• The Contractor shall store the general refuse near buttress wall in enclosed bins and dispose of the waste accumulated on site regularly.</li> <li>• The Contractor shall post the “No Smoking” and “No Naked Flame” notices around the construction site, especially around confined space at outlet dual culvert.</li> </ul>
12 December 2019	<ul style="list-style-type: none"> <li>• The Contractor shall enhance watering to the site, especially to the exposed area at Cell 1X and the main haul road.</li> <li>• The Contractor shall replace the NRMM label on the excavator near Cell 2X and ensure all NRMM labels displaced on site are in correct color and clearly visible.</li> <li>• The Contractor shall not discharge the untreated site water at DP6 outside the site boundary.</li> <li>• The Contractor shall provide drip tray for chemicals stored at the outlet box culvert.</li> <li>• The Contractor shall remove the wash-water at the concrete truck washing area and maintain the platform to avoid overflow of wash-water to the DP4T channel.</li> </ul>

Inspection Date	Environmental Observations and Recommendations
19 December 2019	<ul style="list-style-type: none"> <li>• The Contractor shall replace the NRMM label on the excavator near X9B channel to ensure all NRMM labels displaced on site are in correct colour and clearly visible.</li> <li>• The Contractor shall cover the exposed soil at DP6 to minimize SS runoff to the channel.</li> <li>• The Contractor shall maintain and remove the deposited silt and grit at the temporary drain near future LTP.</li> <li>• The Contractor shall avoid accumulation of stagnant water and maintain the site drainage near the site entrance.</li> </ul>
24 December 2019	<ul style="list-style-type: none"> <li>• The Contractor shall maintain and remove the deposited silt and grit at the temporary drain near future LTP.</li> <li>• The Contractor shall clean up the oil leakage near the site entrance and handle the clean-up materials as chemical waste.</li> <li>• The Contractor shall provide drip trays for the chemicals placed near X9B channel and the future bioplant.</li> <li>• The Contractor shall maintain the temporary drain near the site entrance and ensure the pump is functioning efficiently.</li> <li>• The Contractor shall dispose of the waste accumulated on site regularly to reduce odour and pest issues and store the general refuse near the wheel washing facilities, future LTP and buttress wall properly.</li> </ul>
31 December 2019	<ul style="list-style-type: none"> <li>• The Contractor shall maintain the bund along the DP4T channel near buttress wall to minimize SS runoff to the channel.</li> <li>• The Contractor shall maintain site drainage and remove the stagnant water accumulated near X9B, at future maintenance building and at the temporary drain at Southern site boundary.</li> <li>• The Contractor shall segregate and store the construction waste at X9B, near future maintenance building and at future GVL building properly in refuse skips and dispose of the waste accumulated regularly.</li> </ul>

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 Additional Control Measures**

Deficiencies	Rectifications Implemented	Proposed Additional Control Measures
<b>Surface Water</b>		
Intercepting channels & drainage system	<ul style="list-style-type: none"> <li>Reviewed drainage plan.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of additional drainage channels.</li> <li>Expedite the construction of permanent sediment trap and discharge culverts.</li> </ul>
DP channels (design & regular silt removal)	<ul style="list-style-type: none"> <li>Carried out regular maintenance and cleaning of channels.</li> <li>DP4 channel: Area near the channel was paved with concrete and a bund was built.</li> <li>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.</li> <li>DP6: Pipes through the gravel piles between different channel sections were covered with geotextiles to block debris and silt.</li> </ul>	N.A.
Stockpiles & exposed soil	<ul style="list-style-type: none"> <li>Installed silt fencing near surface water channel along DP6 channel.</li> </ul>	<ul style="list-style-type: none"> <li>Improve soil covering.</li> <li>Compaction and cover for stockpiles and soil slopes.</li> </ul>
Wetsep (treatment capacity & number)	<ul style="list-style-type: none"> <li>Reviewed Wetsep capacity.</li> <li>Chemicals dosage of the Wetsep was increased to enhance the efficiency.</li> </ul>	<ul style="list-style-type: none"> <li>Install additional Wetsep.</li> </ul>
Backflow / ponding during heavy rainfall	<ul style="list-style-type: none"> <li>Raised with EPD (LDG) and CEDD.</li> </ul>	N.A.

**2.6**

**WASTE MANAGEMENT STATUS**

The Contractor has registered as a 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 inert C&D materials. 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 Disposed and Imported Fill Materials**

Month/ Year	Inert C&D Materials <sup>(a)</sup> (in '000m <sup>3</sup> )	Imported Fill (in '000kg)		Inert Construction Waste Re- used (in '000m <sup>3</sup> )	Non-inert Construction Waste <sup>(b)</sup> (in '000m <sup>3</sup> )	Recyclable Materials <sup>(c)</sup> (in '000kg)	Chemical Wastes (in '000kg)
		Rock	Soil				
October 19	0.064	0	10567.52	0	0.087	0	0
November 19	0.410	0	17130.00	0	0.077	0	0
December 19	0	0	4954.21	0	0.065	0	0

**Notes:**

- (a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill. Density assumption: 1.6 (t/m<sup>3</sup>) for public fill
- (b) Non-inert construction wastes include general refuse disposed at landfill. Density assumption: 0.9 (t/m<sup>3</sup>) 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 for surface water quality impact monitoring was recorded in the reporting period. Sampling could not be carried out for the scheduled impact surface water quality monitoring events on 3 October 2019 at DP6 and on 24 and 31 October 2019 and in November and December 2019 at all monitoring locations due to insufficient flow.

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 and successful prosecutions are summarised in *Annex G*.



This Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 October to 31 December 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. Impact surface water quality monitoring could not be carried out on 3 October 2019 at DP6 and on 24 and 31 October 2019 and in November and December 2019 at all monitoring locations due to insufficient flow.

Fourteen environmental site inspections were carried out during the reporting period. Environmental deficiencies were identified during the site inspection and the Contractor has proposed additional control measures to rectify the deficiencies.

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

It is noted that most environmental pollution control and mitigation measures were properly implemented and the construction activities of the Project did not introduce any adverse impact to the sensitive receivers in the reporting period. Yet, some environmental deficiencies were identified during the reporting period and additional control measures have been proposed by the Contractor to rectify the corresponding deficiencies. The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The monitoring programme will be evaluated as appropriate in the next 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







WBS Path	Activity ID	Activity Name	Dur	Start	Finish	Task ID	Predecessor Details	Successor Details	2018			2019			2020			2021			2022			2023		
									Q1	Q2	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
508	SA2.6.03	Chd Engineering Works	1269	02-Nov-19	13-Apr-23	30																				
510	SA2.6.03.1	Landfill Cell 2	449	02-Nov-19	23-Jan-21	810																				
511	6.03.2	63-1000 Earth bund (Eastern)	110	02-Nov-19	19-Feb-20	9	11-1100 FS, 23-2500 FS, 63-4200 FS, 63-1400 FS, 63-2800 FS	63-3000 FS, 63-1500 FS, 63-1800 FS, 63-1900 FS, 63-2000 FS, 63-2100 FS, 63-2200 FS, M12, 1 FS, -50, M12, 2 FS, 63-1100 FS																		
512	6.03.2	63-1100 Earth bund (Western)	110	20-Feb-20	08-Jun-20	84	11-1100 FS, 23-2500 FS, 63-1800 FS, 63-1400 FS, 63-3000 FS	63-1400 FS, 63-1500 FS, 63-1700 FS, 63-3500 FS, 63-3000 FS, 63-1200 FS																		
513	6.03.2	63-1200 Intercell bund (Cell 2/3)	90	09-Jun-20	06-Sep-20	734	11-1100 FS, 23-2500 FS, 63-1800 FS, 63-1400 FS, 63-4400 FS, 63-1100 FS	63-1500 FS																		
514	6.03.2	63-1300 Site Formation	75	02-Jun-19	15-Jan-20	14	11-1100 FS, 23-2500 FS, 63-1800 FS, 63-1400 FS	63-1400 FS, 63-4200 FS																		
515	6.03.2	63-1400 Pump Station (PS42X)	45	09-Jun-20	23-Jul-20	84	63-1500 FS, 63-1100 FS	63-1600 FS, 63-1700 FS																		
516	6.03.2	63-1500 Living Works	90	01-Oct-20	29-Dec-20	710	41-1500 FS, 63-1000 FS, 63-1100 FS, 63-1200 FS	63-1900 FS, M12, 3 FS, 63-2400 FS																		
517	6.03.2	63-1600 Protective Stone Laying & Leachate Collection Pipe	25	30-Dec-20	23-Jan-21	810	63-1500 FS, 41-1500 FS, 63-1400 FS	32-1800 FS, M12, 3 FS																		
518	6.03.2	63-1700 Install Leachate Force Main	75	24-Jul-20	06-Oct-20	84	63-1100 FS, 41-1500 FS, 63-1400 FS	54-2800 FS, M12, 3 FS																		
519	6.03.2	63-1800 Install Landfill Gas Pipe on earth bund	35	20-Feb-20	26-Mar-20	168	41-1500 FS, 63-1000 FS	54-4000 FS, M12, 3 FS																		
522	SA2.6.03.3	Landfill Cell 3	714	20-Feb-20	02-Feb-22	435																				
521	6.03.3	63-1900 Earth bund (Eastern)	110	20-Feb-20	08-Jun-20	9	11-1100 FS, 63-4200 FS, 63-1000 FS, 63-4000 FS, 63-2800 FS, 63-4200 FS	63-3300 FS, 63-3600 FS, 63-2400 FS, 63-2700 FS, M12, 1 FS, -50, M12, 2 FS, 63-2000 FS, -45, 63-2200 FS																		
522	6.03.3	63-2000 Earth bund (Western)	110	25-Apr-20	12-Aug-20	19	11-1100 FS, 63-1000 FS, 63-1900 FS, -45	63-2300 FS, 63-2400 FS, 63-2600 FS, 63-3700 FS, 63-1100 FS, -45																		
523	6.03.3	63-2100 Intercell bund (Cell 3/4)	105	29-Jun-20	11-Oct-20	789	11-1100 FS, 63-1000 FS, 63-4200 FS, 63-2000 FS, -45	63-2400 FS																		
524	6.03.3	63-2200 Site Formation	75	09-Jun-20	23-Aug-20	9	11-1100 FS, 63-1000 FS, 63-1900 FS	63-3300 FS																		
525	6.03.3	63-2300 Pump Station (PS43X)	45	23-Aug-20	16-Oct-20	9	63-2200 FS, 63-2000 FS	63-2500 FS, 63-2600 FS																		
526	6.03.3	63-2400 Living Works	100	01-Oct-21	08-Jan-22	435	41-1500 FS, 63-1900 FS, 63-2000 FS, 63-2100 FS, 63-1500 FS	63-2500 FS, M12, 3 FS																		
527	6.03.3	63-2500 Protective Stone Laying & Leachate Collection Pipe	25	09-Jan-21	03-Feb-21	435	63-2400 FS, 41-1500 FS, 63-2300 FS	32-1700 FS, M12, 3 FS																		
528	6.03.3	63-2600 Install Leachate Force Main	75	07-Oct-20	20-Dec-20	9	63-2000 FS, 41-1500 FS, 63-2300 FS	53-2100 FS, -40, 64-2800 FS, M12, 3 FS																		
529	6.03.3	63-2700 Install Landfill Gas Pipe on earth bund	35	09-Jun-20	13-Jul-20	58	41-1500 FS, 63-1900 FS	54-4000 FS, M12, 3 FS																		
530	SA2.6.03.4	Landfill Cell 4	584	07-Sep-21	15-Apr-23	30																				
531	6.03.4	63-2800 Remaining Portion of Buttress Wall	120	07-Sep-21	04-Jan-22	494	62-1000 FS																			
532	6.03.4	63-2900 Earth bund (Western) incl. MSE Wall	120	07-Sep-21	04-Jan-22	239	62-1000 FS	63-3000 FS, 63-3100 FS, 63-3200 FS, 63-3400 FS, 63-3800 FS, 63-3000 FS, 63-4100 FS, -50, M, 6 FS, -60, M, 9 FS, -30, M, 9 FS																		
533	6.03.4	63-3000 Site Formation	120	05-Jan-22	04-May-22	239	62-1000 FS, 62-1100 FS, 62-1200 FS, 63-2900 FS	63-3100 FS																		
534	6.03.4	63-3100 Pump Station (PS44X)	45	05-May-22	18-Jun-22	239	63-3000 FS, 63-2900 FS	63-3300 FS, 63-3400 FS																		
535	6.03.4	63-3200 Living Works	135	01-Oct-22	12-Feb-23	0	41-1500 FS, 63-2900 FS	63-3300 FS, M12, 6 FS																		
536	6.03.4	63-3300 Protective Stone Laying & Leachate Collection Pipe	60	13-Feb-23	13-Apr-23	0	41-1500 FS, 63-3200 FS, 63-3100 FS	12-1900 FS, 32-1800 FS, M12, 6 FS																		
537	6.03.4	63-3400 Install Leachate Force Main & Remove Temporary Leachate Pipe	30	19-Jun-22	18-Jul-22	269	41-1500 FS, 63-2900 FS, 63-3100 FS	12-1900 FS, 32-1800 FS, M12, 6 FS																		
538	SA2.6.03.5	Drainage - Surface Run-Off	790	16-Jan-20	03-Feb-22	464																				
539	6.03.5	63-3500 Perimeter Channel (X10A) at Cell 2 Western Bund	15	09-Jan-20	23-Jun-20	1054	63-1100 FS	12-1900 FS																		
540	6.03.5	63-3600 Perimeter Channel (X10A) at Cell 2 Western Bund	30	09-Jun-20	08-Jul-20	1029	63-1100 FS	63-4000 FS																		
541	6.03.5	63-3700 Perimeter Channel (X10A) at Cell 3 Western Bund	30	13-Aug-20	11-Sep-20	964	63-2000 FS	63-4000 FS																		
542	6.03.5	63-3800 Perimeter Channel (X10A) at Cell 4 Western Bund	20	05-Jan-22	24-Jan-22	464	63-2900 FS	63-4000 FS																		
543	6.03.5	63-3900 Perimeter Channel (X10C) at Cell 4 Western Bund	15	05-Jan-22	19-Jan-22	469	63-2900 FS	63-4000 FS																		
544	6.03.5	63-4000 Connection to Existing OP3	10	25-Jan-22	03-Feb-22	464	63-3900 FS, 63-3900 FS, 63-3700 FS, 63-3800 FS	12-1900 FS																		
545	6.03.5	63-4100 Remove Cut-Off Channel C-7 at bottom of Buttress Wall	30	09-Jun-21	08-Jul-21	419	63-2900 SS -40	63-3000 FS																		
546	6.03.5	63-4200 Temporary Channel (XTT) at SENT Infrastructure Area	30	16-Jan-20	14-Feb-20	14	63-1300 FS	63-1900 FS, 63-2100 FS																		
547	SA2.6.03.6	Drainage - Ground Water	85	07-Sep-21	30-Nov-21	529																				
548	6.03.6	63-4300 Construct Temporary Channel (TC-1), from M11 to Existing LIC-625	60	07-Sep-21	20-Oct-21	529	23-1900 FS, 11-1300 FS, 62-1000 FS	63-4400 FS																		
549	6.03.6	63-4400 Divert OCV at M11 to TC-1	5	27-Oct-21	31-Oct-21	529	63-4300 FS	63-4500 FS, M, 9 FS																		
550	6.03.6	63-4500 Reconstruct of GWP across Cell 4	30	01-Nov-21	30-Nov-21	529	62-1100 FS, 62-1200 FS, 63-4400 FS	12-1900 FS																		
551	SA2.6.03.8	Utilities - Works Associated with Utilities Undertakers	255	15-Nov-20	27-Jul-21	655																				
552	SA2.6.03.8.1	CLP	210	20-Dec-20	27-Jul-21	655																				
553	6.03.8.U1	63-4600 LFG Generator Ongrid Testing	180	30-Dec-20	27-Jun-21	655	32-2000 FS, 12-1200 FS, 64-4000 FS	63-4700 FS																		
554	6.03.8.U1	63-4700 LFG Generator Ongrid Inspection & Verify	30	28-Jun-21	27-Jul-21	655	63-4600 FS	12-1900 FS																		
555	SA2.6.03.8.2	Town Gas	55	15-Nov-20	08-Jan-21	855																				
556	6.03.8.U2	63-4800 Laying Gas Mains (from LFG to Town Gas PP)	45	15-Nov-20	29-Dec-20	855	64-4000 FF	63-4900 FS																		
557	6.03.8.U2	63-4900 Gas Meter Relocation & Connection at LFG	10	30-Dec-20	08-Jan-21	855	63-4800 FS, 64-4000 FS	12-1900 FS																		
558	SA2.6.04	Building & E&M Works	661	01-Oct-19	22-Jul-21	660																				
559	SA2.6.04.C	Part X1 Area C	661	01-Oct-19	22-Jul-21	660																				
560	SA2.6.04.C.1	LFG Treatment Plant	661	01-Oct-19	22-Jul-21	660																				
561	6.04.C.02	64-1000 GRASSO Slower 01 C Relocation	15	06-Jul-21	02-Jul-21	660	32-1500 FS	12-1900 FS																		
562	6.04.C.02	64-1100 Absorption Chiller (Optional)	90	01-Oct-19	29-Dec-19	1231	54-2000 FS	12-1900 FS																		
563	SA2.6.08	Landscaping Works	613	01-Apr-19	03-Dec-20	891																				
564	SA2.6.08.1	SENT Area - Tree Removal & Transplanting	240	01-Apr-19	26-Nov-19	1264																				
565	6.08.1	68-1000 Access trees condition and select for transplanting	30	01-Apr-19	03-Apr-19	1264	14-1300 FS	68-1100 FS, 68-1200 FS, 68-1400 FS																		

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? <sup>(1)</sup>				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"> <li>The area within 30m of the blasting area will be wetted prior to blasting.</li> <li>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.</li> <li>loose material and stones in the Site will be removed prior to the blast operation</li> <li>During blasting, blast nets, screens and other protective covers will be used to prevent the projection of flying fragments and material resulting from blasting</li> </ul>	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"> <li>Watering will be carried out at the rock drilling activities to avoid fugitive dust emissions.</li> </ul>	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? <sup>(1)</sup>				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"> <li>The main haul road will be kept clear of dusty materials or sprayed with water.</li> <li>The main haul road will be paved with aggregate or gravel.</li> <li>Vehicle speed will be limited to 10kph.</li> </ul>	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>	Deficiency of mitigation measures but rectified by the Contractor
4.8.1	AQ4	<u>Stockpiling of Dusty Materials</u> <ul style="list-style-type: none"> <li>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.</li> </ul>	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>	Reminder was given to Contractor
4.8.1	AQ5	<u>Loading, unloading or transfer of dusty materials</u> <ul style="list-style-type: none"> <li>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.</li> </ul>	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>	Deficiency of mitigation measures but rectified by the Contractor
4.8.1	AQ6	<u>Site Boundary and Entrance</u> <ul style="list-style-type: none"> <li>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</li> </ul>	To minimise potential dust nuisance	Site boundary and entrance	SENTX Contractor				✓	<i>Air Pollution Control (Construction Dust) Regulations</i>  <i>HKAQO and EIAO-</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? <sup>(1)</sup>				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"> <li>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.</li> </ul>	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"> <li>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.</li> <li>Any dusty materials remaining after a stockpile is removed will be wetted with water and cleared from the surface of roads or street.</li> </ul>	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"> <li>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.</li> </ul>	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? <sup>(1)</sup>				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? <sup>(1)</sup>				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"> <li>• Only well-maintained plant will be operated on-site and plant should be serviced regularly during the construction program;</li> <li>• Silencers or mufflers on construction equipment should be utilized and will be properly maintained during the construction program;</li> <li>• Mobile plant, if any, will be sited as far from NSRs as possible;</li> <li>• 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;</li> <li>• 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</li> <li>• Material stockpiles and other structures will be effectively utilised, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	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? <sup>(1)</sup>				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
<b>Water Quality – Construction Phase</b>												
6.8.1	WQ1	<u>Construction Runoff</u> <ul style="list-style-type: none"> <li>Exposed soil areas will be minimised to reduce the contamination of runoff and erosion.</li> </ul>	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"> <li>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.</li> </ul>	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	Deficiency of mitigation measures but rectified by the Contractor
6.8.1	WQ3	<ul style="list-style-type: none"> <li>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.</li> </ul>	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"> <li>Temporary covers such as tarpaulin will also be provided to minimise the generation of high SS runoff.</li> </ul>	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"> <li>The surface runoff contained any oil</li> </ul>	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? <sup>(1)</sup>				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"> <li>All sewer and drains will be sealed to prevent building debris, soil etc from entering public sewers/drains before commencing any demolition works</li> </ul>	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"> <li>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.</li> </ul>	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"> <li>The fuel and waste lubricant oil from the on-site maintenance of machinery and equipment will be collected by a licensed chemical waste collector.</li> </ul>	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"> <li>Implementation of excavation schedules, lining and covering of excavated stockpiles</li> </ul>	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"> <li>Monitoring of surface water quality will be conducted on a regular basis as stated in the EM&amp;A Manual.</li> </ul>	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? <sup>(1)</sup>				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	Deficiency of mitigation measures but rectified by the Contractor
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? <sup>(1)</sup>				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>									
		<p>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.</p>	To reduce construction waste generation	SENTX Site	SENTX Contractor				✓	WDO EIAO-TM Annex 7	Deficiency of mitigation measures but rectified by the Contractor
7.6.1	WM4	<u>Chemical Waste</u>									
		<p>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></p>	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? <sup>(1)</sup>				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? <sup>(1)</sup>				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
7.8	WM8	waste reduction, reuse and recycling.  <u>Environmental Monitoring &amp; 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	
<b>Landfill Gas Hazards - Design and Construction Phase</b>											
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>	Deficiency of mitigation measures but rectified by the Contractor	
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? <sup>(1)</sup>				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? <sup>(1)</sup>				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		<ul style="list-style-type: none"> <li>The surface runoff contained any oil and grease will pass through the oil interceptors; and,</li> <li>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.</li> </ul>								-	Not applicable
										-	Implemented
9.10.2 and SENTX latest design	EC2	<u>Good Construction Practice:</u> <ul style="list-style-type: none"> <li>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.</li> <li>The work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.</li> </ul>	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 &amp; 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? <sup>(1)</sup>				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
construction period.											
<b>Landscape and Visual – Construction Phase</b>											
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>	Not applicable
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? <sup>(1)</sup>				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>	Reminder was given to Contractor
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>	Implemented
10.6.5	LV7	CM7 - The Contractor's office, leachate treatment plant and laboratory will be surrounded by a minimum of 5m wide and 0.75m high earth bund on the west and south sides planted with a dense screen of tree and shrub vegetation. Additional tree planting will be provided in unused spaces with thin infrastructure	To minimise the landscape and visual impacts	Infrastructure area	SENTX Contractor	✓	✓			<i>EIAO-TM Annex 18 and ETWBC 7/2002</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? <sup>(1)</sup>				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>	Implemented
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.

**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	15 Surface Water Monitoring (pm) Noise Monitoring (pm)	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.

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

December 2019

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

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

## 24-hour TSP Monitoring Results

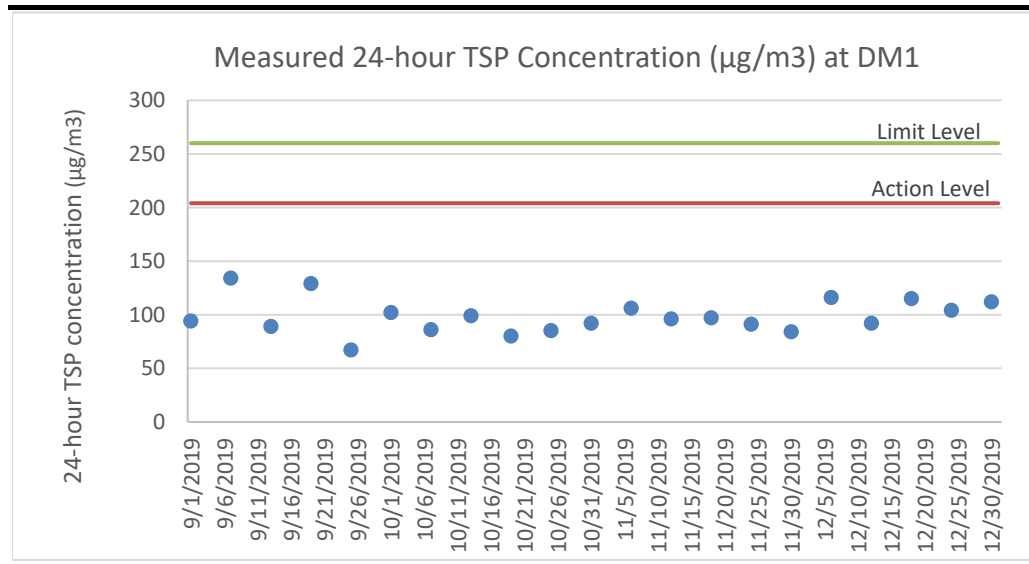
**Table D1.1 24-hour TSP Monitoring Results at DM1**

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
6 Nov 19	8:30	7 Nov 19	8:30	Fine	106
12 Nov 19	8:30	13 Nov 19	8:30	Cloudy	96
18 Nov 19	12:30	19 Nov 19	12:30	Fine	97
24 Nov 19	8:00	25 Nov 19	8:00	Fine	91
30 Nov 19	8:00	1 Dec 19	8:00	Cloudy	84
6 Dec 19	10:33	7 Dec 19	10:33	Fine	116
12 Dec 19	8:00	13 Dec 19	8:00	Fine	92
18 Dec 19	8:55	19 Dec 19	8:55	Cloudy	115
24 Dec 19	8:00	25 Dec 19	8:00	Fine	104
30 Dec 19	9:28	31 Dec 19	9:28	Rainy	112
<b>Average</b>					97
<b>Min</b>					80
<b>Max</b>					116

**Note:**

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

**Figure D1.1 Graphical Presentation for 24-hr TSP Monitoring at DM1**



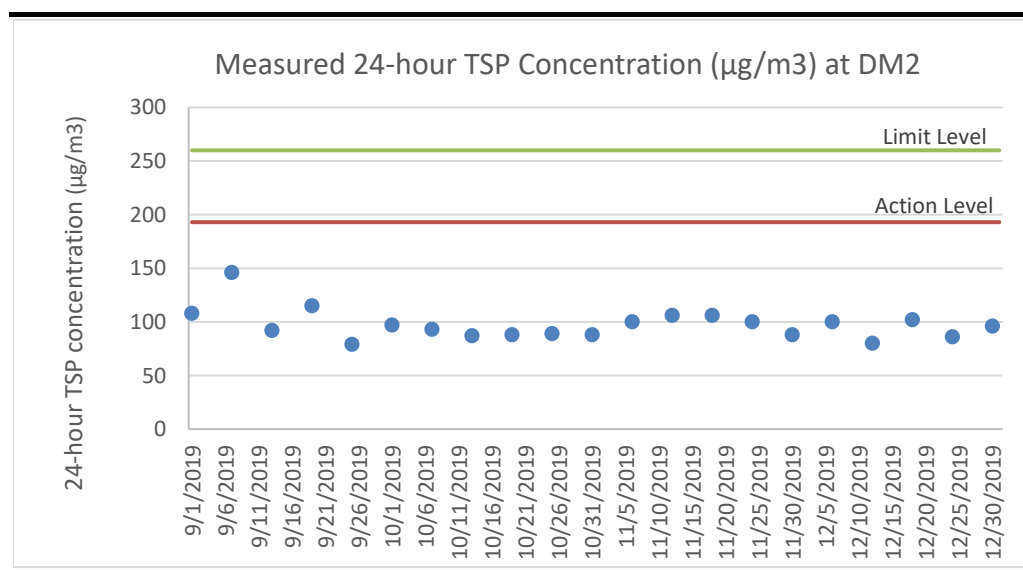
**Table D1.2 24-hour TSP Monitoring Results at DM2**

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
6 Nov 19	8:35	7 Nov 19	8:35	Fine	100
12 Nov 19	8:30	13 Nov 19	8:30	Cloudy	106
18 Nov 19	12:35	19 Nov 19	12:35	Fine	106
24 Nov 19	8:00	25 Nov 19	8:00	Fine	100
30 Nov 19	8:00	1 Dec 19	8:00	Cloudy	88
6 Dec 19	10:42	7 Dec 19	10:42	Fine	100
12 Dec 19	8:00	13 Dec 19	8:00	Fine	80
18 Dec 19	8:10	19 Dec 19	8:10	Cloudy	102
24 Dec 19	8:00	25 Dec 19	8:00	Fine	86
30 Dec 19	9:35	31 Dec 19	9:35	Rainy	96
<b>Average</b>					94
<b>Min</b>					80
<b>Max</b>					106

**Note:**

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

**Figure D1.2 Graphical Presentation for 24-hr TSP Monitoring at DM2**



Annex D2

## Event and Action Plan for Dust Monitoring

**Annex D2**     *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"> <li>Identify the source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project</li> <li>Repeat measurement to confirm finding if exceedance is due to the Project</li> <li>Increase monitoring frequency to daily if exceedance is due to the Project and continue until the monitoring results reduce to below action level</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> </ul>	<ul style="list-style-type: none"> <li>Rectify any unacceptable practice</li> <li>Amend working methods if appropriate</li> </ul>
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> <li>Identify the source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>If exceedance continues, arrange meeting with Contractor &amp; IEC</li> <li>Continue monitoring at daily intervals if exceedance is due to the Project</li> <li>If no exceedance for 3 consecutive days, cease additional monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> <li>Discuss with ET and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Submit proposals for remedial measures to IEC</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ul>

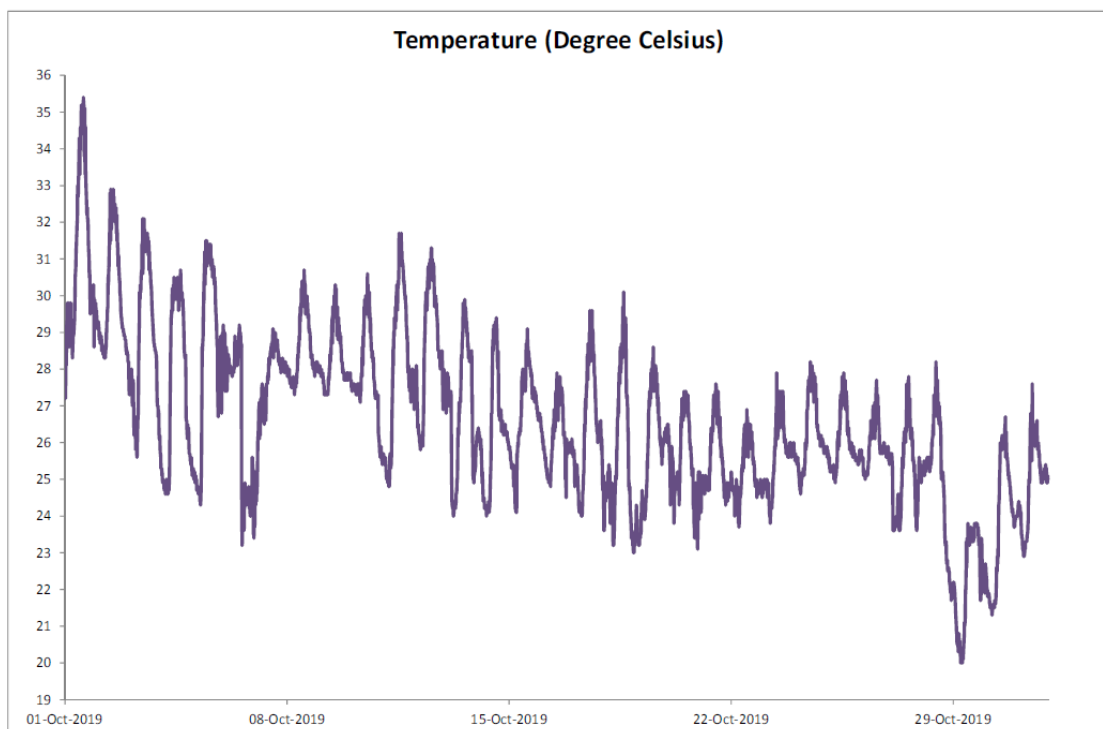
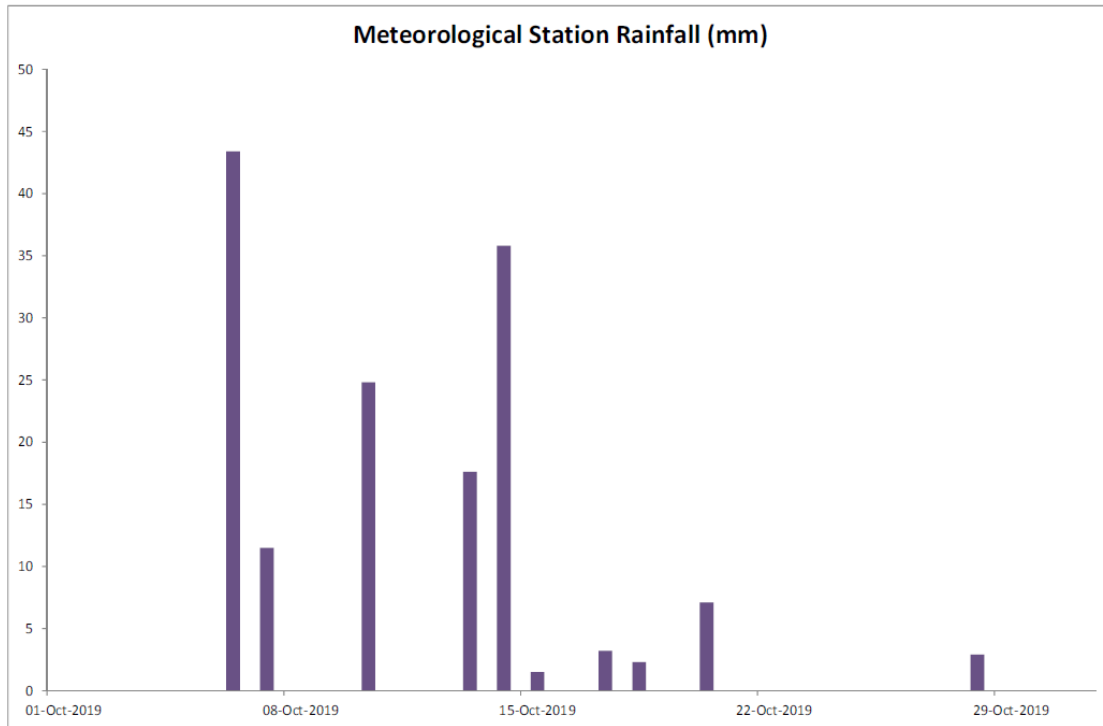
Event	Action		
	ET	IEC	Contractor
<i>Limit Level</i>			
Exceedance for one sample	<ul style="list-style-type: none"> <li>Identify the source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC, Project Proponent and EPD whether the cause of exceedance is due to the Project</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>Repeat measurement to confirm finding if exceedance is due to the Project</li> <li>Increase monitoring frequency to daily if exceedance is due to the Project and continue until the monitoring results reduce to below limit level</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> <li>Discuss with ET and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial measures to IEC</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ul>
Exceedance for two or more consecutive samples	<ul style="list-style-type: none"> <li>Identify source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC, Project Proponent and EPD the causes &amp; actions taken for the exceedances</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>Continue monitoring at daily intervals if exceedance is due to the Project</li> <li>If no exceedance for 3 consecutive days, cease additional monitoring</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> <li>Discuss with ET and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial measures to IEC</li> <li>Implement the agreed proposals</li> <li>Resubmit proposals if problem still not under control</li> </ul>

Annex D3

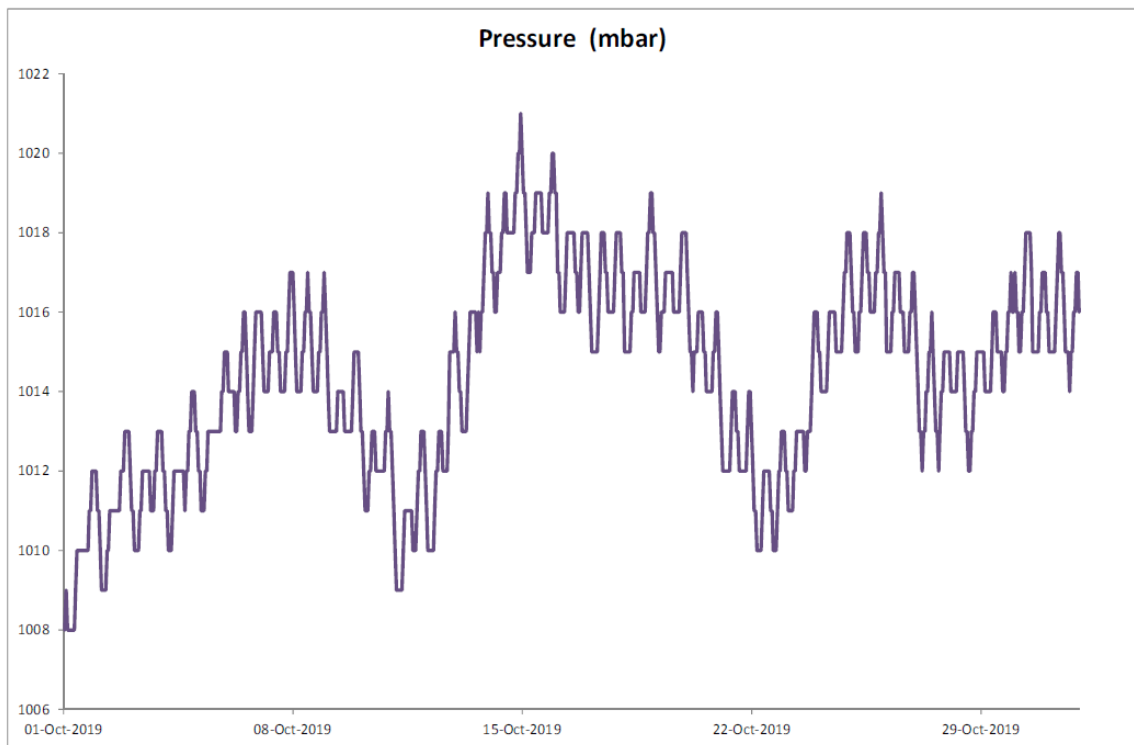
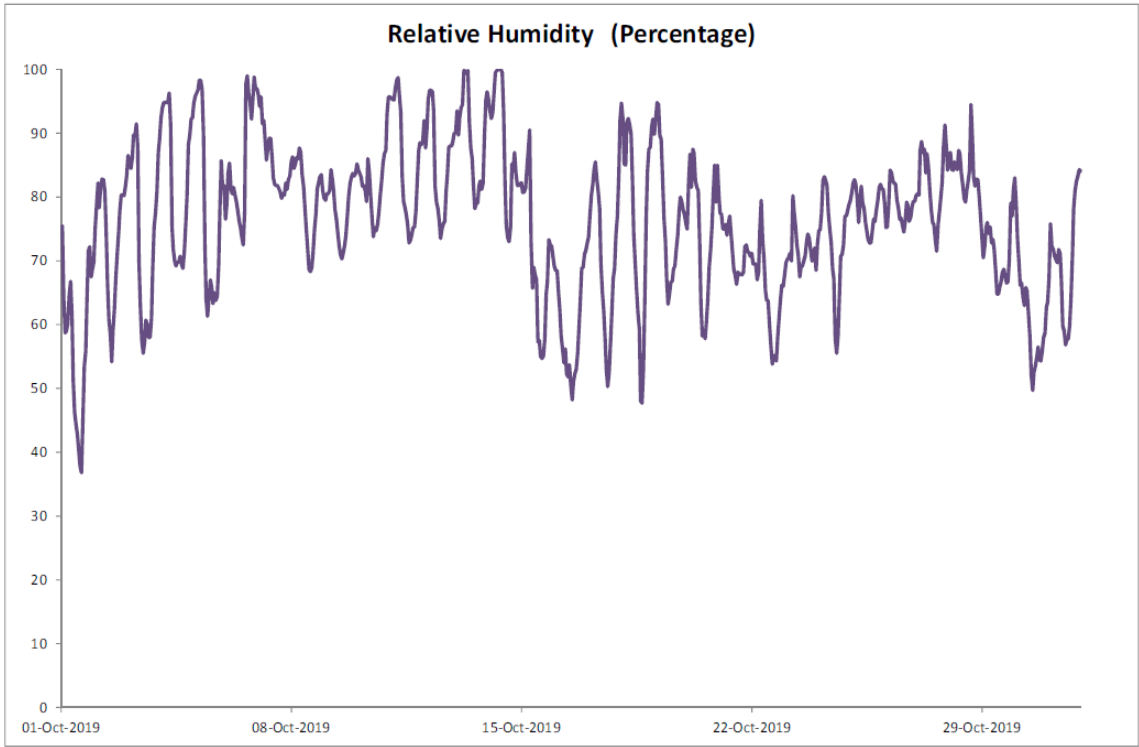
## Meteorological Data

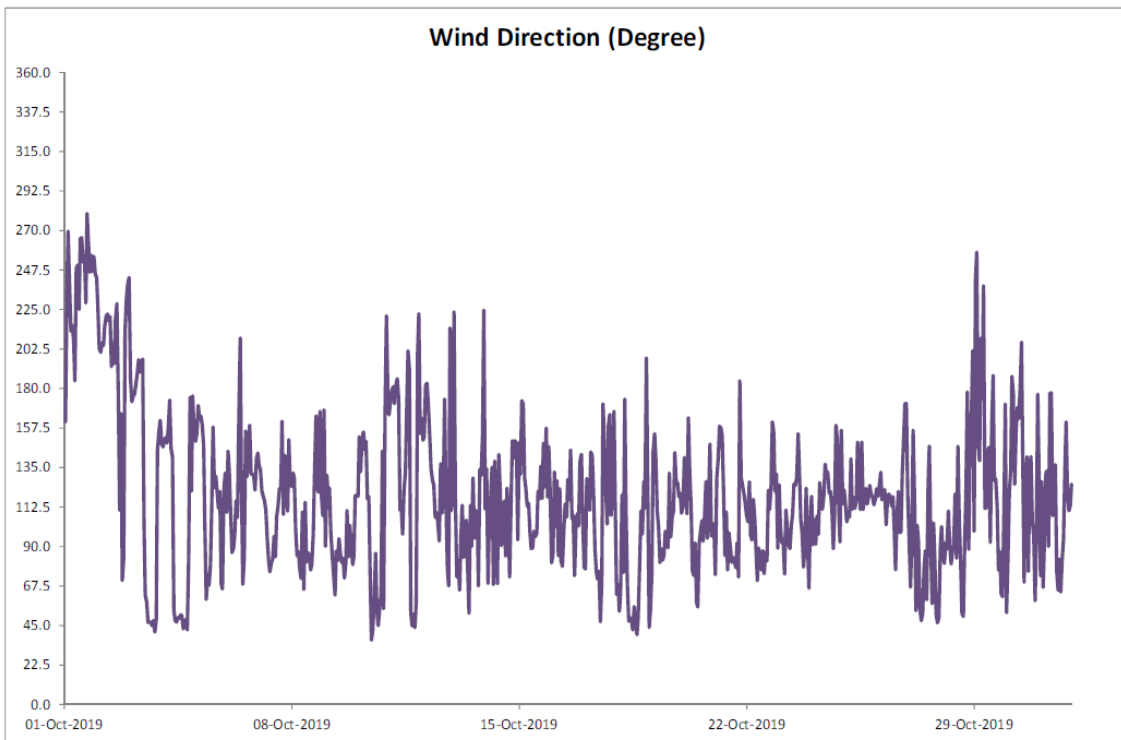
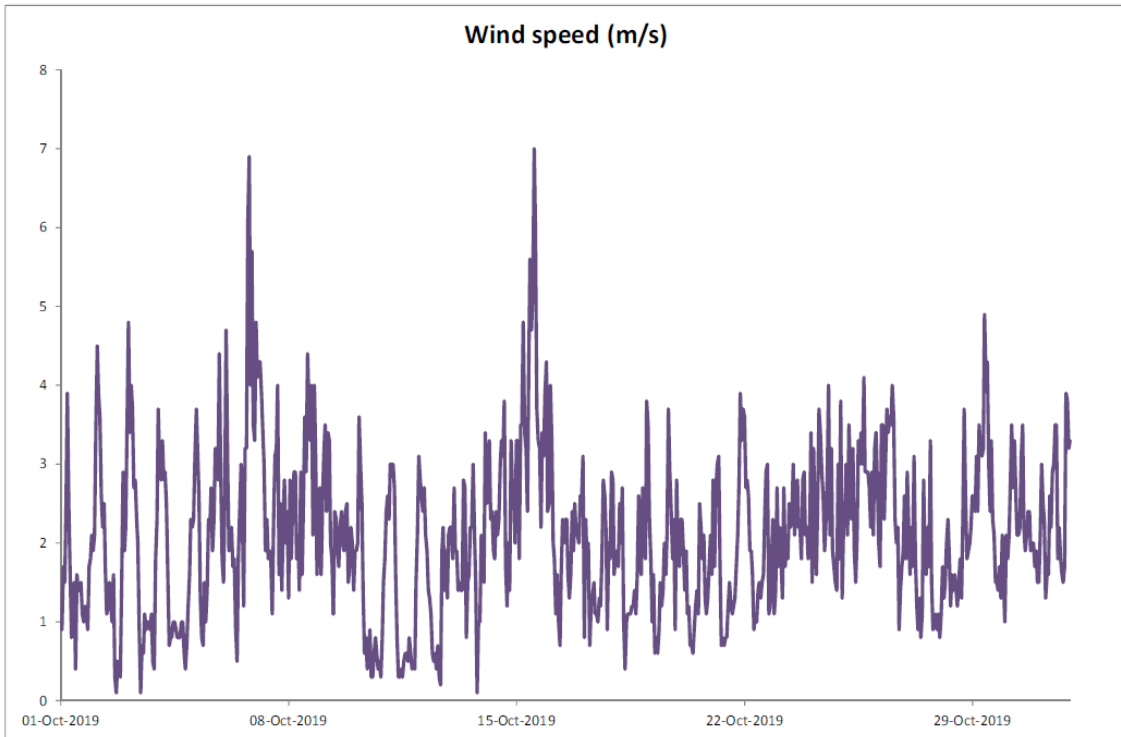
*Annex D3 Meteorological Data*

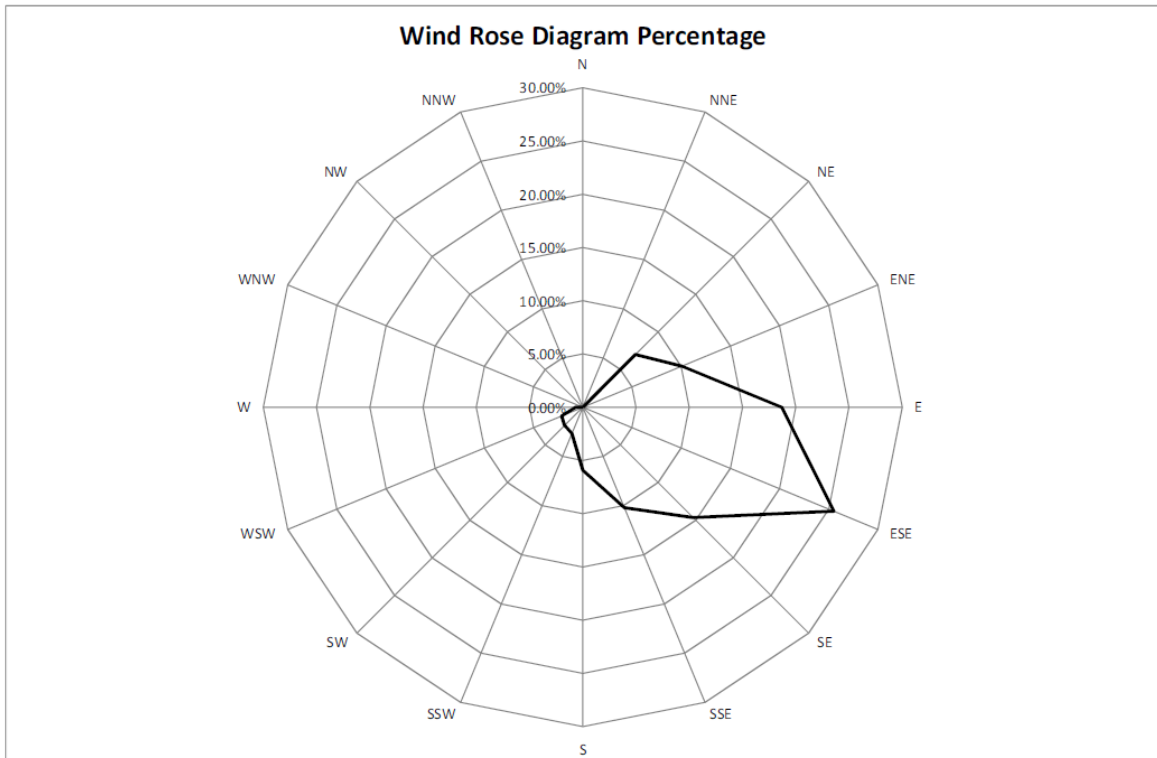
October 2019









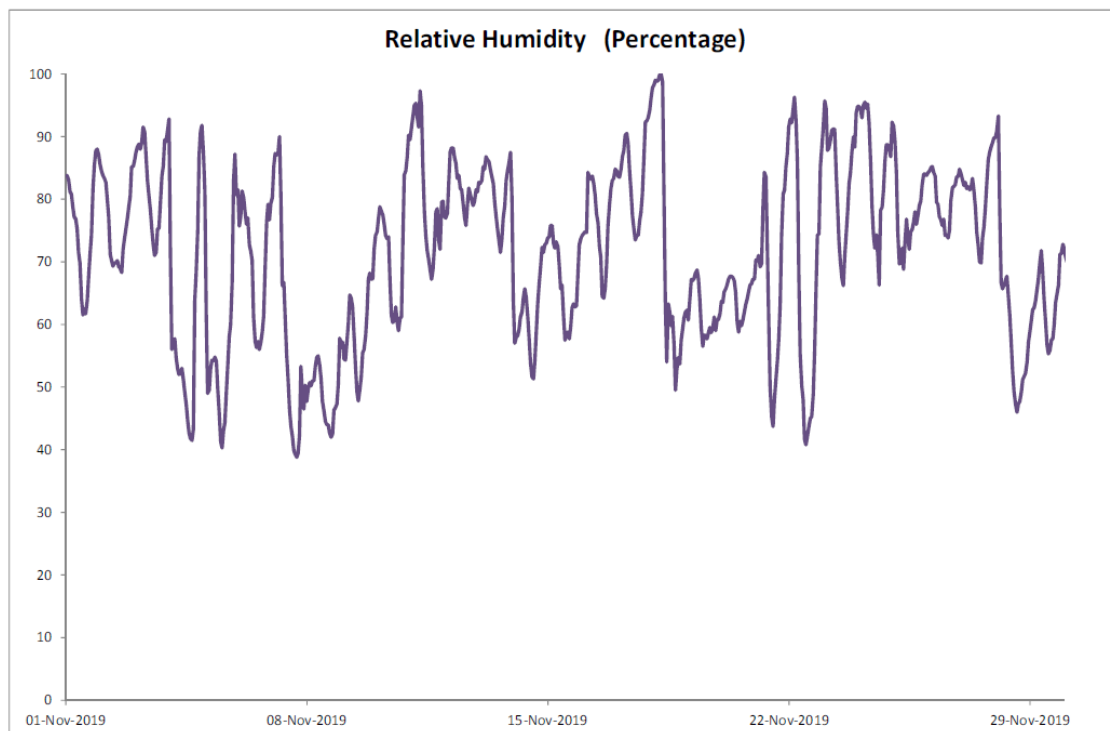
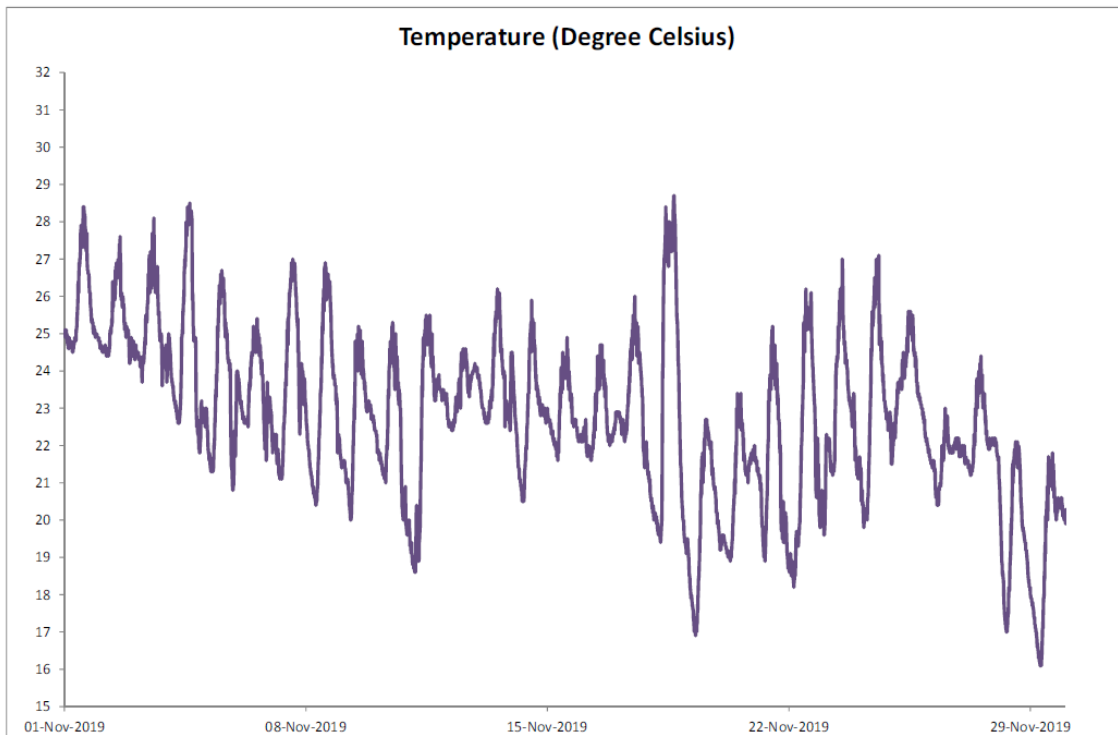


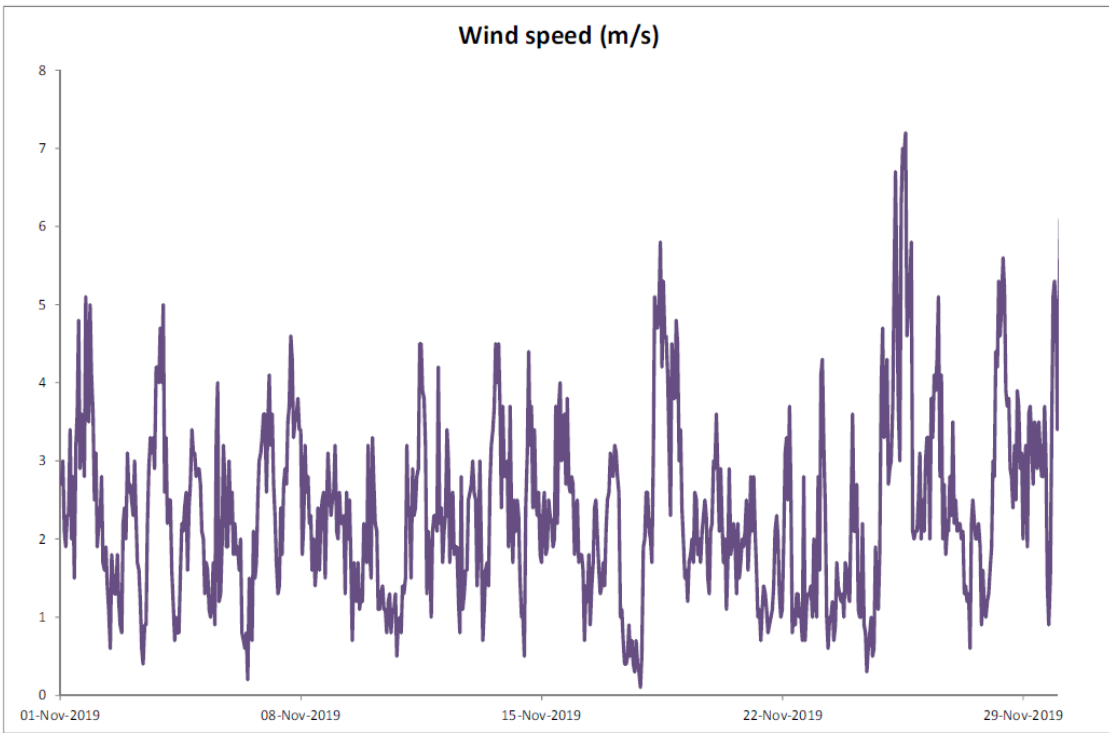
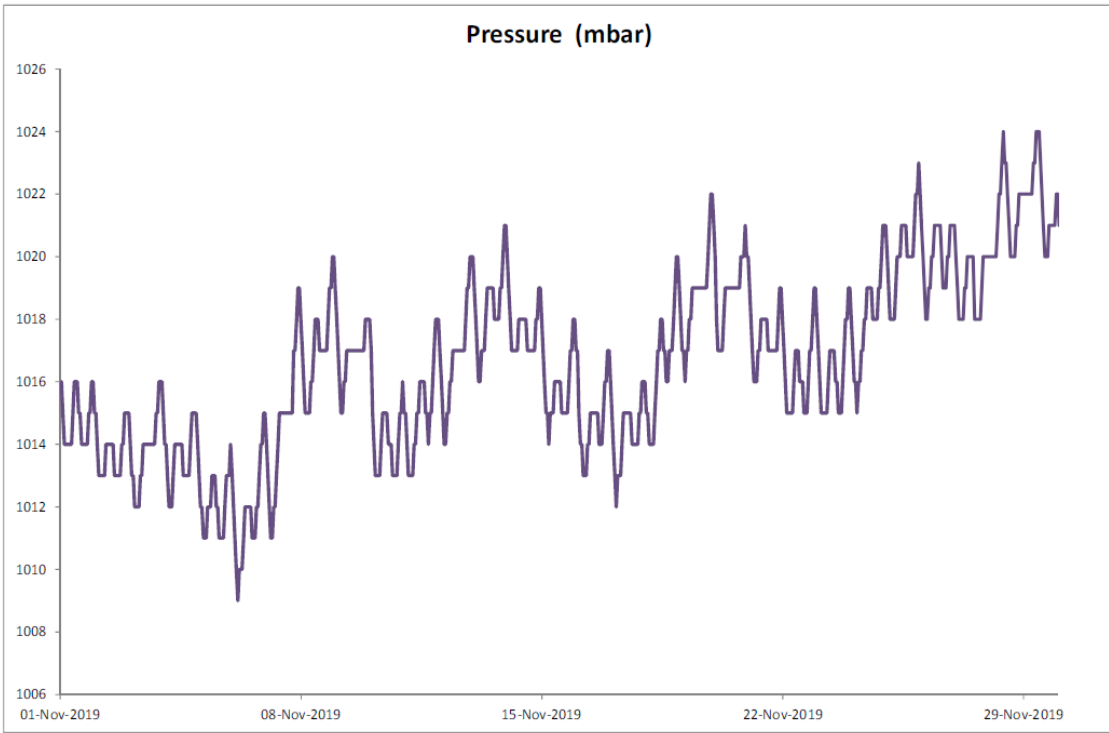
## Manual Rain Gauge Readings

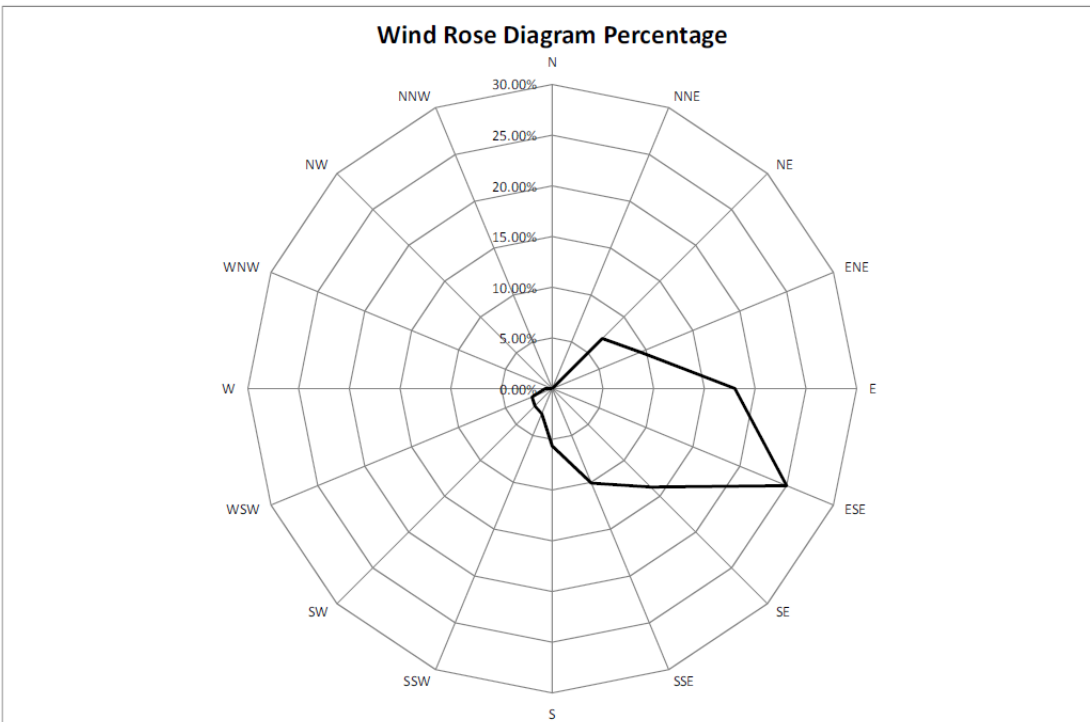
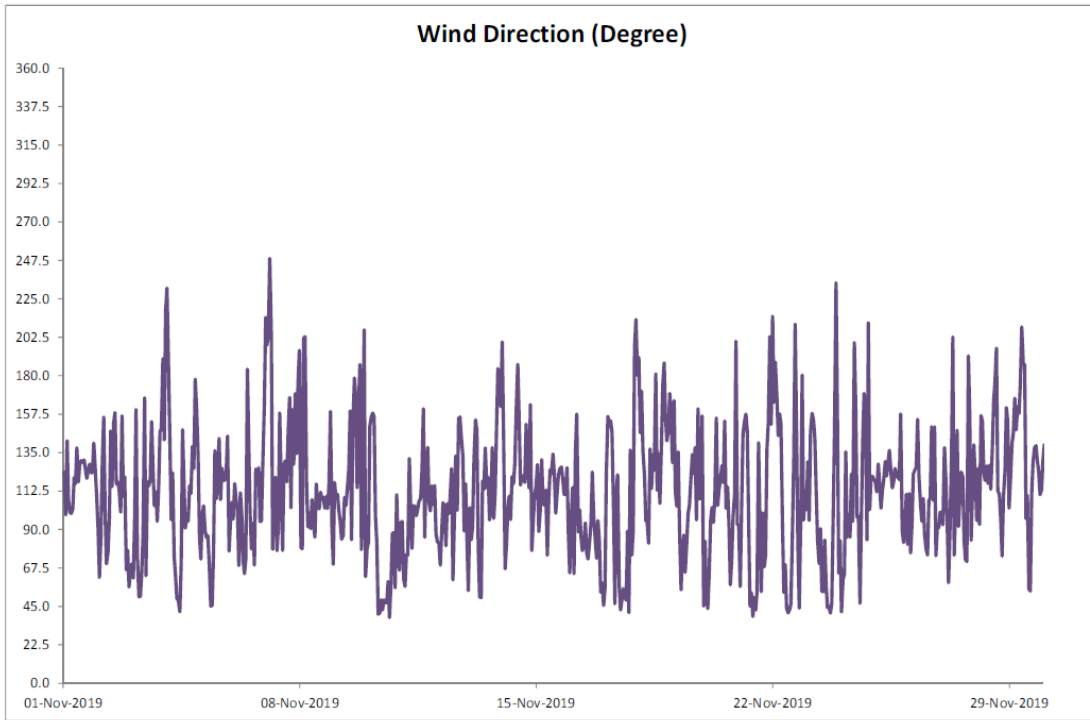
October 2019

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
<b>TOTAL RAINFALL</b>	<b>110.1</b>

November 2019





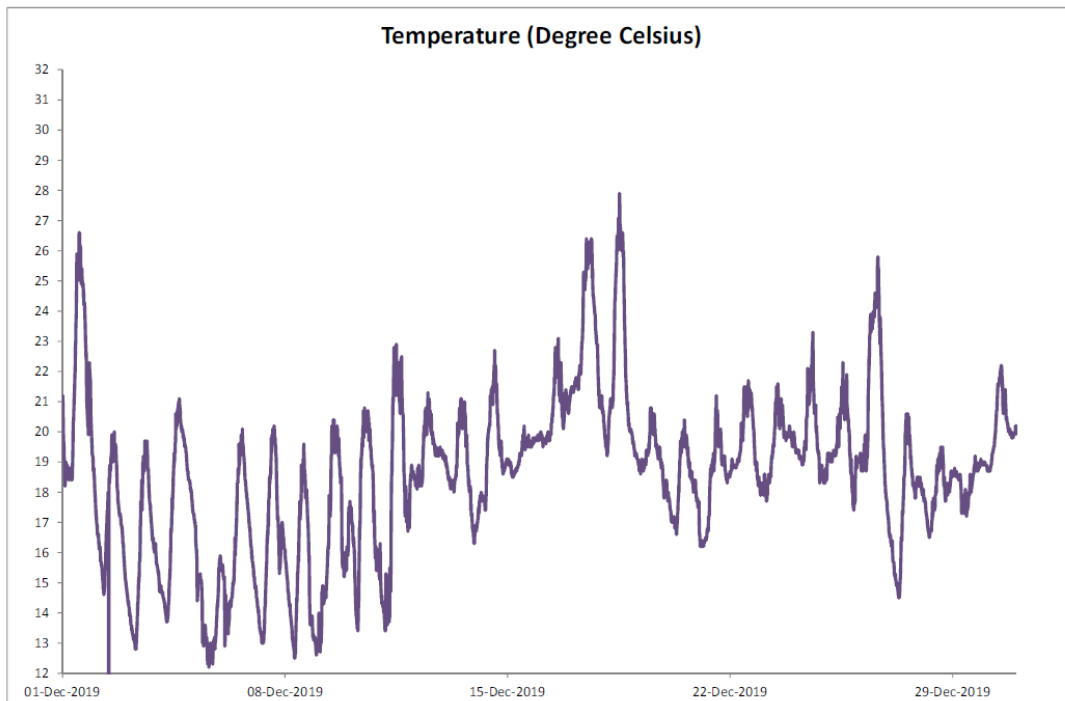


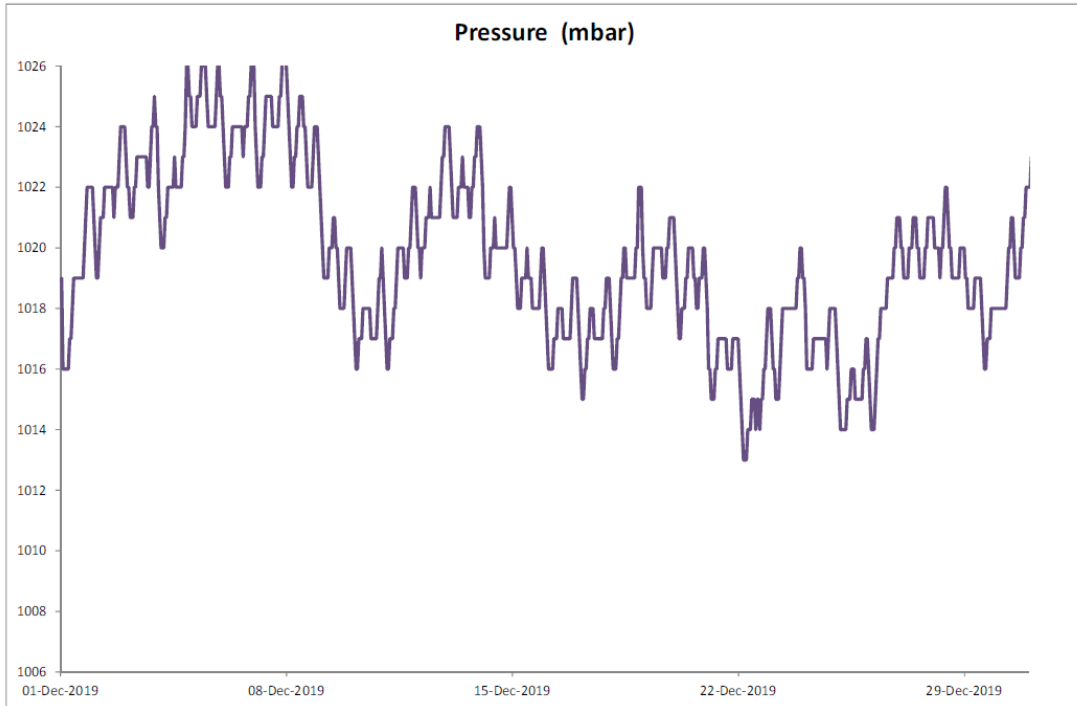
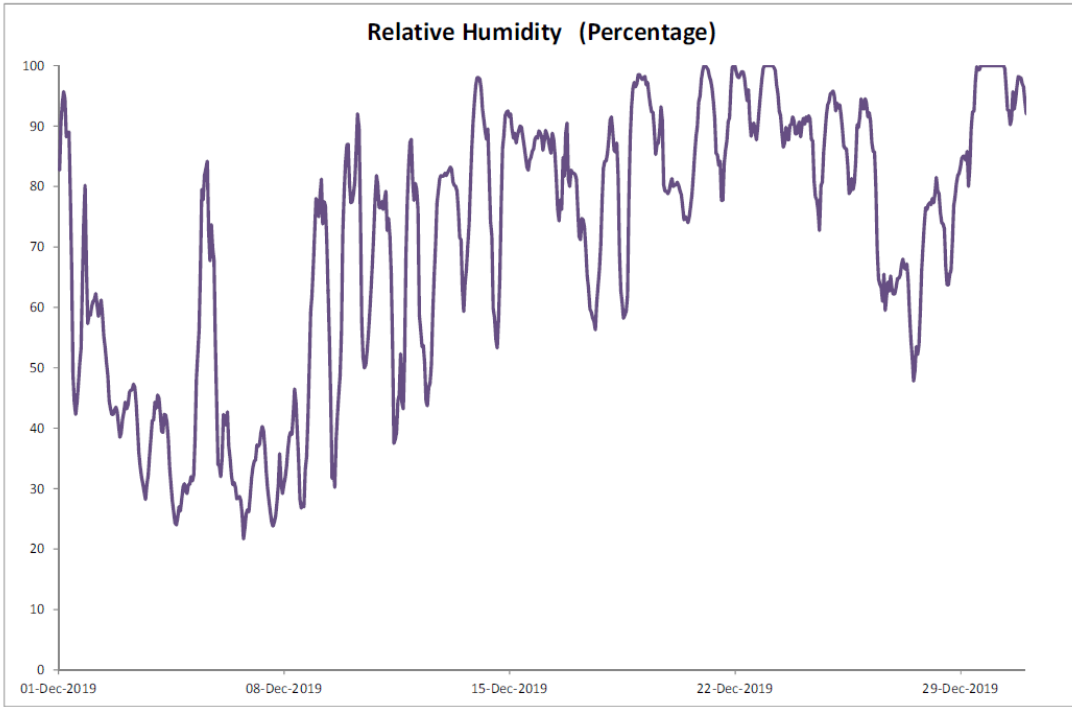
## Manual Rain Gauge Readings

November 2019

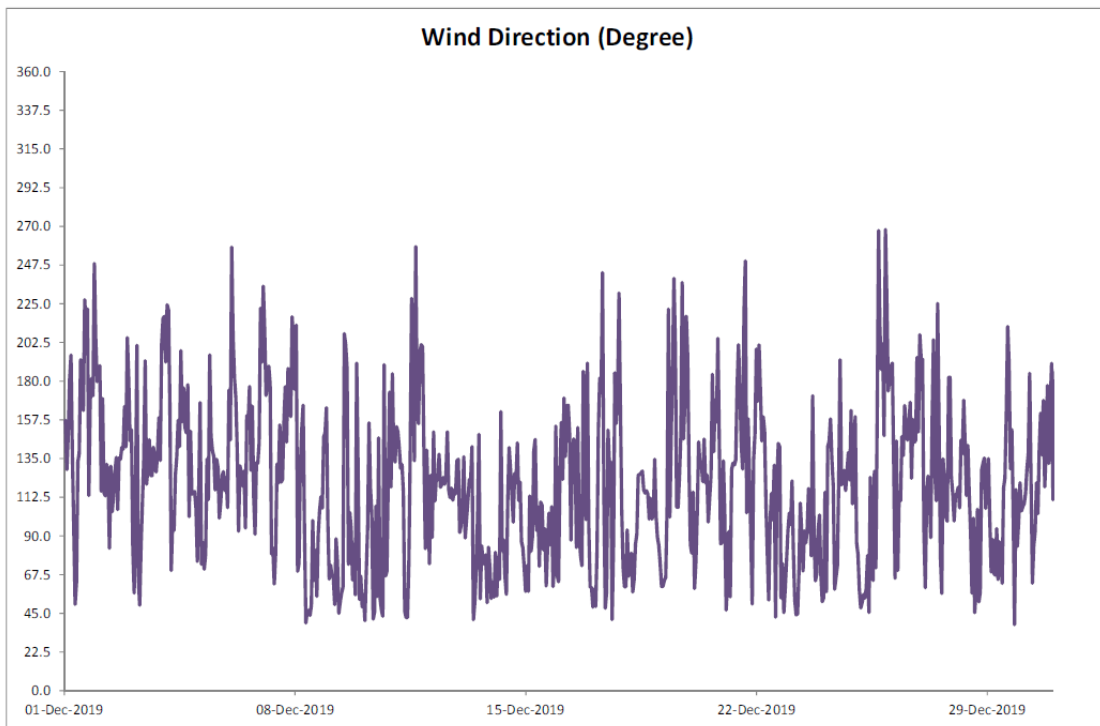
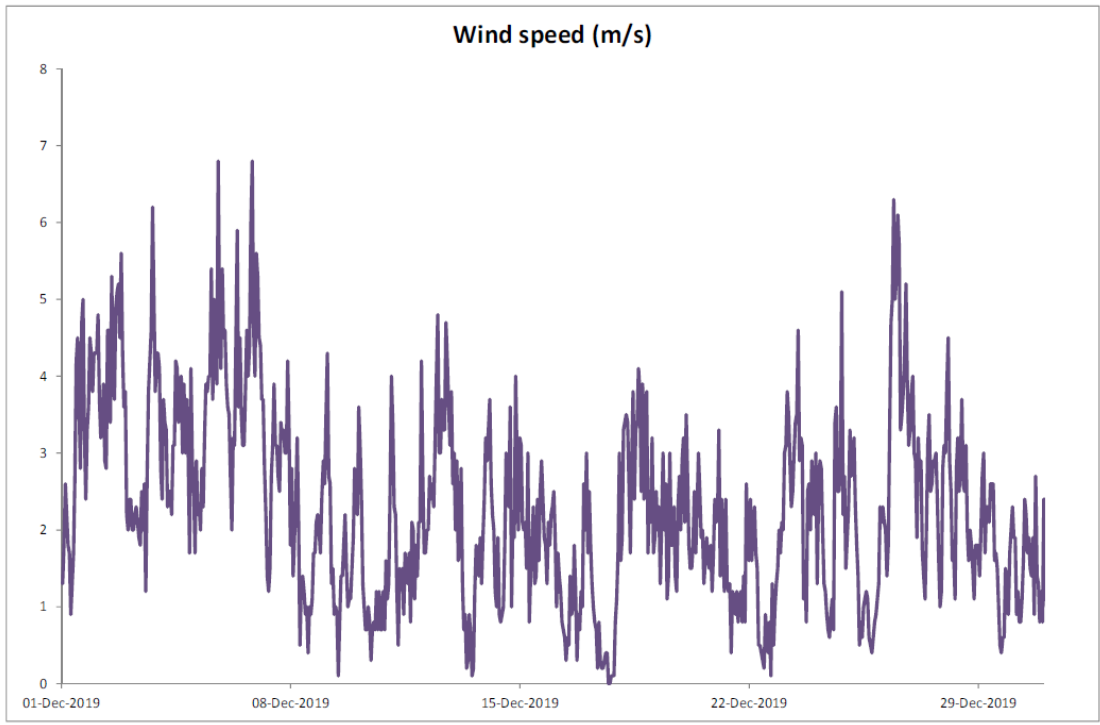
Date	Rainfall (mm)
1-Nov-19	0.0
2-Nov-19	0.0
3-Nov-19	0.0
4-Nov-19	0.0
5-Nov-19	0.0
6-Nov-19	0.0
7-Nov-19	0.0
8-Nov-19	0.0
9-Nov-19	0.0
10-Nov-19	0.0
11-Nov-19	0.0
12-Nov-19	0.0
13-Nov-19	0.0
14-Nov-19	0.0
15-Nov-19	0.0
16-Nov-19	0.0
17-Nov-19	0.0
18-Nov-19	0.0
19-Nov-19	0.0
20-Nov-19	0.0
21-Nov-19	0.0
22-Nov-19	0.0
23-Nov-19	0.0
24-Nov-19	0.0
25-Nov-19	0.0
26-Nov-19	0.0
27-Nov-19	0.0
28-Nov-19	0.0
29-Nov-19	0.0
30-Nov-19	0.0
<b>TOTAL RAINFALL</b>	<b>0.0</b>

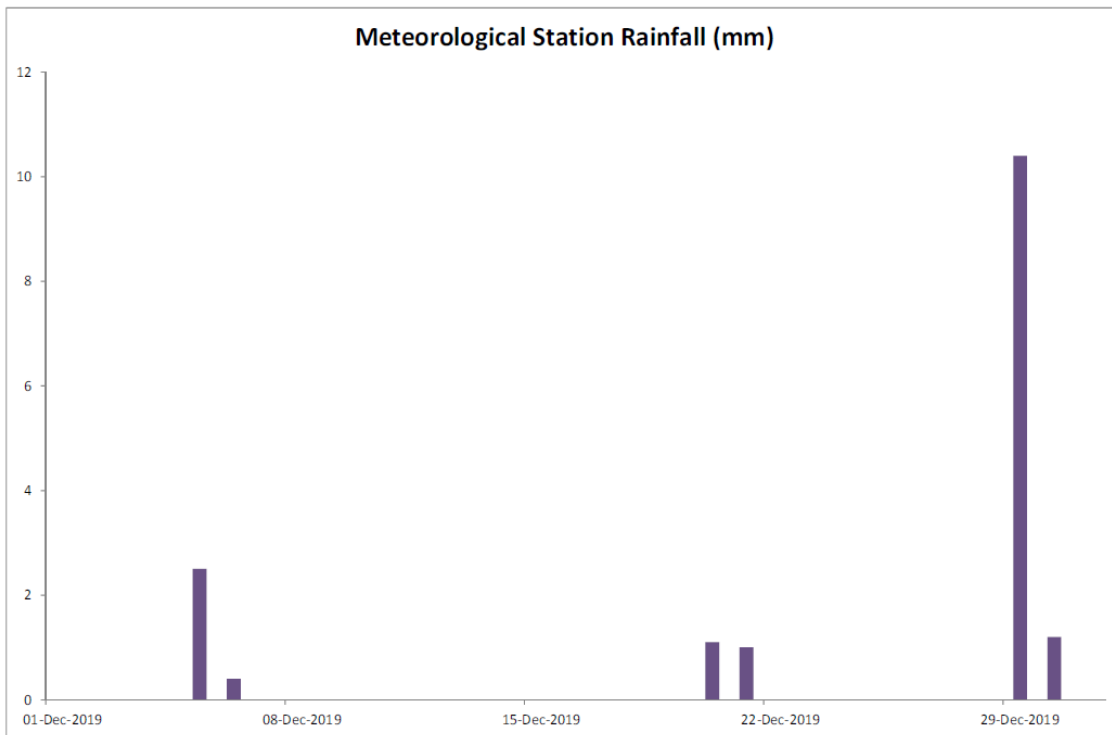
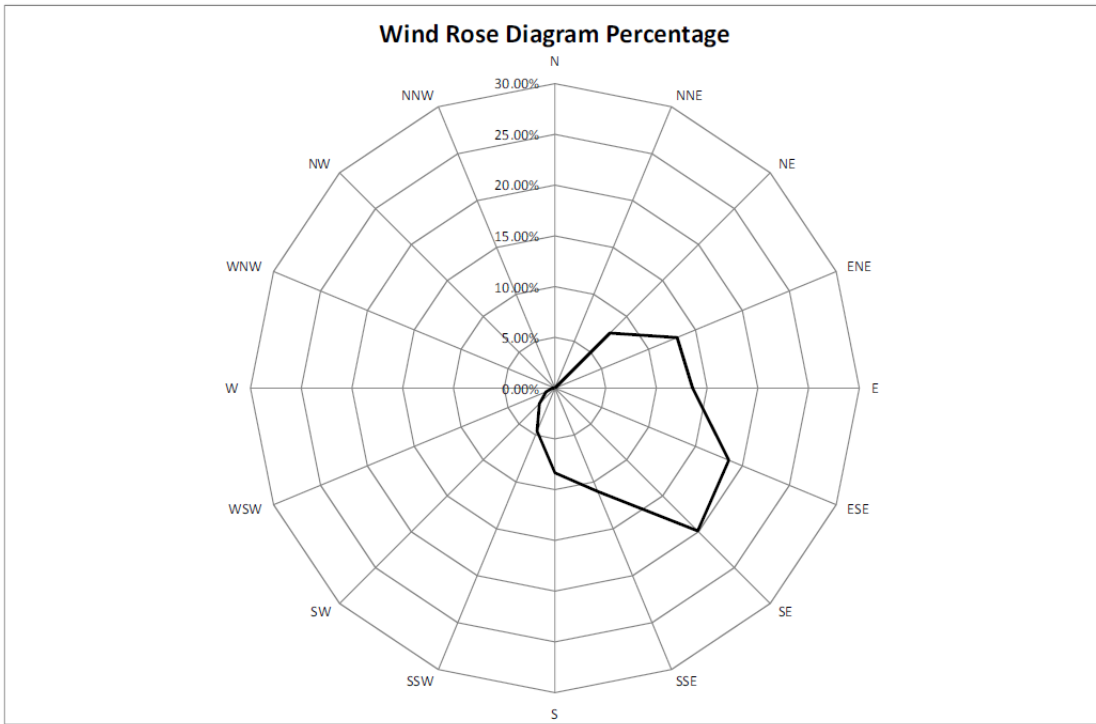
## December 2019











## Manual Rain Gauge Readings

December 2019

Date	Rainfall (mm)
1 Dec 19	0.0
2 Dec 19	0.0
3 Dec 19	0.0
4 Dec 19	0.0
5 Dec 19	3.6
6 Dec 19	0.0
7 Dec 19	0.0
8 Dec 19	0.0
9 Dec 19	0.0
10 Dec 19	0.0
11 Dec 19	0.0
12 Dec 19	0.0
13 Dec 19	0.0
14 Dec 19	0.0
15 Dec 19	0.0
16 Dec 19	0.0
17 Dec 19	0.0
18 Dec 19	0.1
19 Dec 19	0.0
20 Dec 19	2.8
21 Dec 19	0.4
22 Dec 19	0.2
23 Dec 19	0.0
24 Dec 19	0.0
25 Dec 19	0.0
26 Dec 19	0.0
27 Dec 19	0.0
28 Dec 19	0.0
29 Dec 19	15.0
30 Dec 19	0.2
31 Dec 19	0.2
<b>TOTAL RAINFALL</b>	<b>22.5</b>

Annex E

## Noise

Annex E1

## Noise Monitoring Results

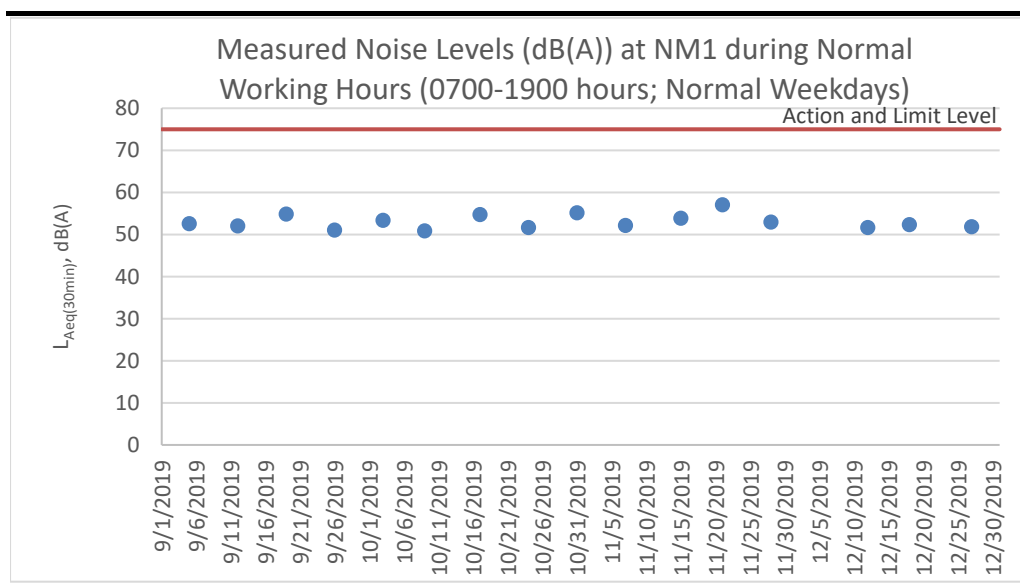
**Table E1.1 Measured Noise Levels (dB(A)) at NM1 during Normal Working Hours (0700-1900 hours; Normal Weekdays)**

Date	Start Time	Finish Time	Weather	L <sub>10</sub> (30min)	L <sub>90</sub> (30min)	L <sub>eq</sub> (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
7 Nov 19	14:37	15:07	Sunny	53.5	50.0	52.1
15 Nov 19	15:01	15:31	Sunny	56.0	48.0	53.8
21 Nov 19	14:34	15:04	Sunny	58.5	54.5	57.0
28 Nov 19	14:39	15:09	Sunny	54.0	51.0	52.9
5 Dec 19	NA	NA	Rainy	Monitoring was cancelled due to adverse weather.		
12 Dec 19	14:56	15:26	Sunny	53.0	49.0	51.6
18 Dec 19	15:01	15:31	Sunny	54.5	47.5	52.3
27 Dec 19	14:59	15:29	Sunny	53.0	48.0	51.8
<b>Average</b>						53.1
<b>Min</b>						50.8
<b>Max</b>						57.0

**Note:**

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

**Figure E1.1 Graphical Presentation for Noise Monitoring at NM1**



Annex E2

## Event and Action Plan for Noise Monitoring

**Annex E2**      *Event and Action Plan for Construction Noise*

Event	Action		
	ET	IEC	Contractor
<p>Action Level</p> <ul style="list-style-type: none"> <li>Identify the source(s) and investigate the cause(s) of exceedance and complaint</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Discuss with ET and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Submit proposals for remedial measures to IEC</li> <li>Implement the agreed proposals</li> </ul>	
<p>Limit Level</p> <ul style="list-style-type: none"> <li>Identify the source(s) and investigate the cause(s) of exceedance and complaint</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC, Project Proponent and EPD whether the cause of exceedance is due to the Project</li> <li>Analyse the operation of SENTX and investigate the causes of exceedance</li> <li>Provide interim report to Contractor, IEC, Project Proponent and EPD the causes of the exceedances</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>Report the remedial measures implemented and the additional monitoring results to Contractor, IEC, Project Proponent and EPD</li> <li>Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Discuss with ET and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Take immediate measures to avoid further exceedance</li> <li>Submit proposals for remedial measures to IEC within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Resubmit proposals if problem still not under control</li> <li>Stop the relevant activity of works as determined by the Project Proponent until the exceedance is abated</li> </ul>	



Annex F

## Surface Water Quality

Annex F1

# Surface Water Quality Monitoring Results

**Table F1.1 Surface Water Quality Monitoring Results at DP4T**

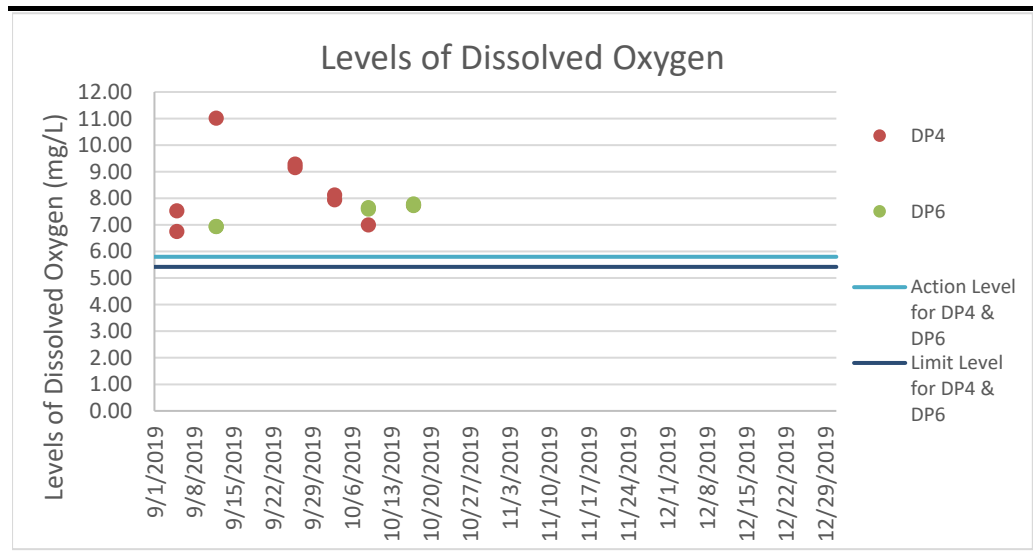
Date	Time	Weather Condition	Water Appearance	Water Condition	Water Temperature (°C)	Dissolved Oxygen (DO) (mg/L)	pH	Suspended Solids (SS) (mg/L)	Remarks
3 Oct 19	14:31	Sunny	Light yellow	Clear	29.7	8.12	7.92	6.2	-
3 Oct 19	14:40	Sunny	Light yellow	Clear	29.9	7.94	7.79	7.1	DP4 (Future, temporary) (Duplicate)
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					-
7 Nov 19	14:12	Sunny		Unable to collect water sample due to insufficient flow					-
15 Nov 19	14:10	Sunny		Unable to collect water sample due to insufficient flow					-
21 Nov 19	14:23	Sunny		Unable to collect water sample due to insufficient flow					-
28 Nov 19	14:26	Sunny		Unable to collect water sample due to insufficient flow					-
5 Dec 19	14:23	Rainy		Unable to collect water sample due to insufficient flow					-
12 Dec 19	14:22	Sunny		Unable to collect water sample due to insufficient flow					-
18 Dec 19	14:33	Sunny		Unable to collect water sample due to insufficient flow					-
27 Dec 19	14:27	Sunny		Unable to collect water sample due to insufficient flow					-
<b>Average</b>						7.70	7.83	7.3	-
<b>Min</b>						6.99	7.68	6.2	-
<b>Max</b>						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 F1.2 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					
7 Nov 19	14:20	Sunny		Unable to collect water sample due to insufficient flow					
15 Nov 19	14:21	Sunny		Unable to collect water sample due to insufficient flow					
21 Nov 19	14:08	Sunny		Unable to collect water sample due to insufficient flow					
28 Nov 19	14:12	Sunny		Unable to collect water sample due to insufficient flow					
5 Dec 19	14:08	Rainy		Unable to collect water sample due to insufficient flow					
12 Dec 19	14:10	Sunny		Unable to collect water sample due to insufficient flow					
18 Dec 19	14:45	Sunny		Unable to collect water sample due to insufficient flow					
27 Dec 19	14:18	Sunny		Unable to collect water sample due to insufficient flow					
<b>Average</b>						7.68	7.79	5.2	-
<b>Min</b>						7.59	7.64	4.0	-
<b>Max</b>						7.78	7.99	6.5	-

**Figure F1.1 Graphical Presentation for Surface Water Quality Monitoring (DO)**



**Figure F1.2 Graphical Presentation for Surface Water Quality Monitoring (pH)**

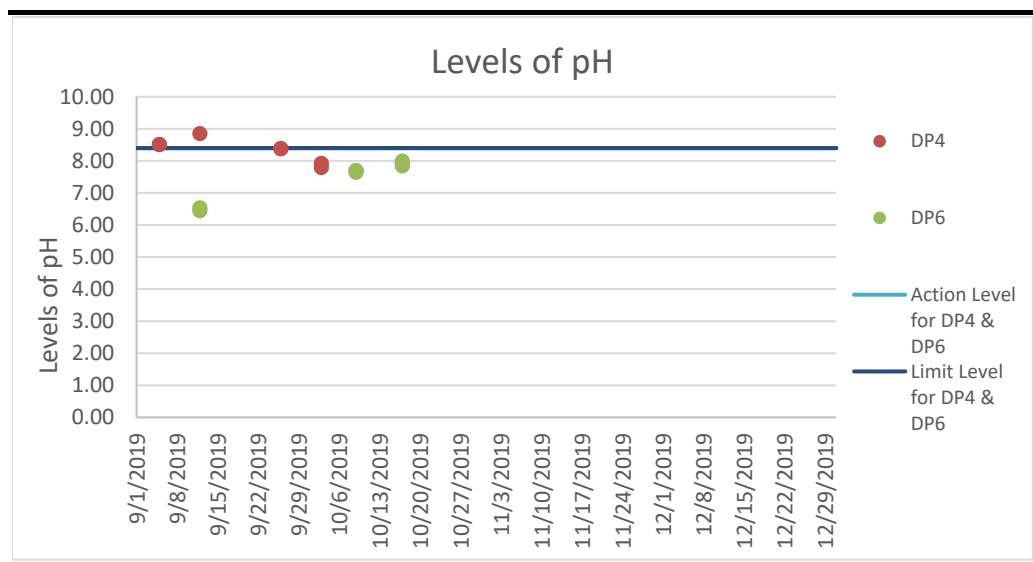
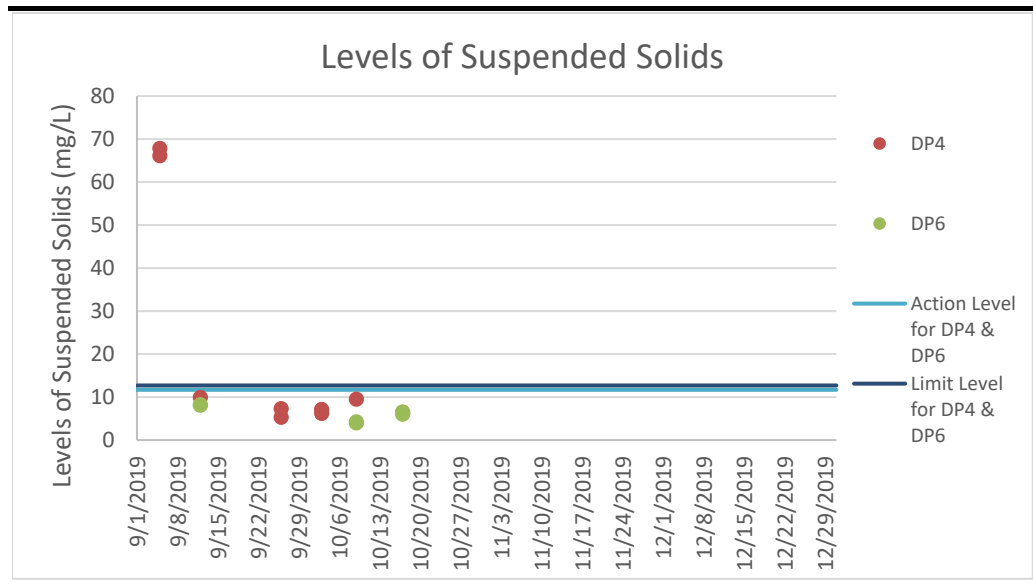


Figure F1.3 Graphical Presentation for Surface Water Quality Monitoring (SS)



Annex F2

# Event and Action Plan for Surface Water Quality Monitoring

**Annex F2**      *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"> <li>Repeat <i>in situ</i> measurement to confirm findings</li> <li>Identify the source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project</li> <li>Repeat measurement on the next day of exceedance if exceedance is due to the Project</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> </ul>	<ul style="list-style-type: none"> <li>Rectify any unacceptable practice</li> <li>Amend working methods if appropriate</li> </ul>
Action Level being exceeded by two consecutive sampling days	<ul style="list-style-type: none"> <li>Repeat <i>in situ</i> measurement to confirm findings</li> <li>Identify the source(s) and investigate the cause(s) of exceedance</li> <li>Prepare Notification of Exceedance within 24 hours</li> <li>Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project</li> <li>Discuss with Contractor and IEC for remedial measures required</li> <li>Ensure remedial measures are properly implemented</li> <li>Increase the monitoring frequency to daily if exceedance is due to the Project and continue until no exceedance of Action Level</li> </ul>	<ul style="list-style-type: none"> <li>Verify the Notification of Exceedance</li> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working methods</li> <li>Discuss with ET Leader and Contractor on proposed remedial measures</li> <li>Review proposals on remedial measures</li> <li>Audit the implementation of the remedial measures</li> <li>Audit the effectiveness of the implemented remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>Submit proposals for remedial measures to IEC</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ul>



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

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 October - 31 December 2019)	0	0	0
Total no. received since project commencement	1	0	0