

ERM-Hong Kong, Limited (ERM) was appointed by OSCAR Bioenergy Joint Venture (the Contractor) as the Environmental Team (ET) to undertake the construction Environmental Monitoring and Audit (EM&A) programme for the *Contract No. EP/SP/61/10 of Organic Waste Treatment Facilities Phase I*, which the project name has been updated to *Organic Resources Recovery Centre (Phase I) (the Project)* since November 2017. ERM was also appointed by the Contractor to undertake the operation EM&A programme starting 1 March 2019.

### **1.1 PURPOSE OF THE REPORT**

This is the 73<sup>rd</sup> EM&A report which summarises the monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 30 June 2021.

### **1.2 STRUCTURE OF THE REPORT**

The structure of the report is as follows:

#### **Section 1: Introduction**

It details the scope and structure of the report.

#### **Section 2: Project Information**

It summarises the background and scope of the Project, site description, project organisation and status of the Environmental Permits (EP)/licences.

#### **Section 3: Environmental Monitoring and Audit Requirements**

It summarises the environmental monitoring requirements including monitoring parameters, programmes, methodologies, frequency, locations, Action and Limit Levels, Event/ Action Plans, as well as environmental audit requirements as recommended in the EM&A Manual and approved EIA report.

#### **Section 4: Monitoring Results**

It summarises monitoring results of the reporting period.

#### **Section 5: Site Audit**

It summarises the audit findings of the environmental as well as landscape and visual site audits undertaken within the reporting period.

#### **Section 6: Environmental Non-conformance**

It summarises any exceedance of environmental performance standard, environmental complaints and summons received within the reporting period.

***Section 7: Further Key Issues***

It summarises the impact forecast for the next reporting month.

***Section 8: Conclusions***

**2.1****BACKGROUND**

The Organic Resources Recovery Centre (ORRC) Phase I development (hereinafter referred to as “the Project”) is to design, construct and operate a biological treatment facility with a capacity of about 200 tonnes per day and convert source-separated organic waste from commercial and industrial sectors (mostly food waste) into compost and biogas through proven biological treatment technologies. The location of the Project site is shown in *Annex A*.

The environmental acceptability of the construction and operation of the Project had been confirmed by findings of the associated Environmental Impact Assessment (EIA) Study completed in 2009. The Director of Environmental Protection (DEP) approved this EIA Report under the *Environmental Impact Assessment Ordinance* (EIAO) (Cap. 499) in February 2010 (Register No.: AEIAR-149/2010) (hereafter referred to as the approved EIA Report). Subsequent Report on Re-assessment on Environmental Implications and Report on Re-assessment on Hazard to Life Implications were completed in 2013, respectively.

An Environmental Permit (EP) (No. EP-395/2010) was issued by the DEP to the EPD (Project Team), the Permit Holder, on 21 June 2010 and varied on 18 March 2013 (No. EP-395/2010/A) and 21 May 2013 (No. EP-395/2010/B), respectively. The Design Build and Operate Contract for the ORRC Phase 1 (Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1) (the Contract)) was awarded to SITA Waste Services Limited, ATAL Engineering Limited and Ros-Roca, Sociedad Anonima jointly trading as the OSCAR Bioenergy Joint Venture (OSCAR or the Contractor). A Further EP (No. FEP-01/395/2010/B) was issued by the DEP to the OSCAR on 16 February 2015. Variation to both EPs (Nos. EP-395/2010/B and FEP-01/395/2010/B) were made in December 2015. The latest EPs, Nos. EP-395/2010/C and FEP-01/395/2010/C, were issued by the DEP on 21 December 2015.

Under the requirements of Condition 5 of the EP (No. FEP-01/395/2010/C), an Environmental Monitoring and Audit (EM&A) programme as set out in the approved EM&A Manual (hereinafter referred to as EM&A Manual) is required to be implemented during the construction and operation of the Project. ERM-Hong Kong, Ltd (ERM) has been appointed by OSCAR as the Environmental Team (ET) for the construction phase EM&A programme and the Monitoring Team (MT) for the operation phase EM&A programme for the implementation of the EM&A programme in accordance with the requirements of the EP and the approved EM&A Manual.

The construction works commenced on 21 May 2015. The operation phase of

the EM&A programme commenced on 1 March 2019 <sup>(1)</sup>. The construction phase EM&A programme was completed in the end of February 2020.

## 2.2 GENERAL SITE DESCRIPTION

The Project Site is located at Siu Ho Wan in North Lantau with an area of about 2 hectares. The layout of the Project Site is illustrated in *Annex A*. The facility received and treated an average of 100 tonnes of source separated organic waste per day during the reporting month.

## 2.3 MAJOR ACTIVITIES UNDERTAKEN

A summary of the major activities undertaken in the reporting period is shown in *Table 2.1*.

**Table 2.1 Summary of Activities Undertaken in the Reporting Period**

Activities Undertaken in the Reporting Period
<ul style="list-style-type: none"> <li>Systems being operated – waste reception, pre-treatment, CAPCS extraction, the digesters, the centrifuge, the composting tunnels the desulphurisation, the emergency flare, the CHPs, the ASP and the biological waste water treatment plant (about 100-130 t/d SSOW input); and</li> <li>Process fine-tune – adjustment of the ASP operational parameters with new treatment media, CEMS/SCADA modification and improvement work following equipment failures and the alteration of different operation modes and measures to adapt to the high variation of SSOW nature and sources.</li> </ul>

## 2.4 PROJECT ORGANISATION AND MANAGEMENT STRUCTURE

The project organisation chart and contact details are shown in *Annex B*.

## 2.5 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the valid permits, licences, and/or notifications on environmental protection for this Project is presented in *Table 2.2*.

**Table 2.2 Summary of Environmental Licensing, Notification and Permit Status**

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	FEP-01/395/2010/C	Throughout the Contract	Permit granted on 21 December 2015
Effluent Discharge License	WT00024352-2016	3 June 2016 – 30 June 2021	Approved on 3 June 2016
Chemical Waste Producer Registration	WPN 5213-961-O2231-02	Throughout the implementation of the Project	Approved on 10 November 2017

(1) As some of the minor items are yet to be closed out in March 2019, the construction phase EM&A programme and Operation Phase EM&A programme were undertaken in parallel in March 2019.

<b>Permit/ Licences/ Notification</b>	<b>Reference</b>	<b>Validity Period</b>	<b>Remarks</b>
Waste Disposal Billing Account	Account number: 702310	Throughout the Contract	-

### 3.1 ENVIRONMENTAL MONITORING

The air quality (including odour) monitoring to be carried out during the commissioning and operation phase of the Project are described below. Although water quality monitoring is not required for the operation phase under the EM&A programme, there are water quality monitoring requirement under the Water Discharge Licence of the plant under the *Water Pollution Control Ordinance* (WPCO). As part of this EM&A programme, the monitoring results will be reviewed to check the compliance with the WPCO requirements.

#### 3.1.1 Air Quality

According to the EM&A Manual and EP requirements, stack monitoring are required during the commissioning and operation phase of the Project.

On-line monitoring (using continuous environmental monitoring system (CEMS)) shall be carried out for the centralised air pollution unit (CAPCS), cogeneration units (CHP) and the ammonia stripping plant (ASP) during the commissioning and operation phase. The calibration certificate for the on-line monitoring equipment is provided in *Annex C*.

The monitoring data is transmitted instantaneously to EPD (Regional Office) by telemetry system.

When the on-line monitoring for certain parameter cannot be undertaken, monitoring will be carried out using the following methodology approved by the EPD.

**Table 3.1 Sampling and Laboratory Analysis Methodology**

Parameters	Method	Stacks to be Monitored
Gaseous and vaporous organic substances (including methane)	USEPA Method 18	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>
Particulate	USEPA Method 5	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>
Carbon monoxide (CO)	USEPA Method 10	<ul style="list-style-type: none"> <li>• CHP</li> <li>• ASP</li> </ul>
Nitrogen oxides (NO <sub>x</sub> )	USEPA Method 7E	<ul style="list-style-type: none"> <li>• CHP</li> <li>• ASP</li> </ul>
Sulphur dioxide (SO <sub>2</sub> );	USEPA Method 6	<ul style="list-style-type: none"> <li>• CHP</li> <li>• ASP</li> </ul>
Hydrogen chloride (HCl)	USEPA Method 26A	<ul style="list-style-type: none"> <li>• CHP</li> <li>• ASP</li> </ul>

Parameters	Method	Stacks to be Monitored
Hydrogen fluoride (HF)	USEPA Method 26A	<ul style="list-style-type: none"> <li>• CHP</li> <li>• ASP</li> </ul>
Oxygen (O <sub>2</sub> );	USEPA Method 3A	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>
Velocity and Volumetric Flow	USEPA Method 2	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>
Ammonia (NH <sub>3</sub> )	USEPA CTM 027	<ul style="list-style-type: none"> <li>• ASP</li> </ul>
Odour (including NH <sub>3</sub> and H <sub>2</sub> S)	EN 13725	<ul style="list-style-type: none"> <li>• CAPCS</li> </ul>
Water vapour content (continuous measurement of the water vapour content should not be required if the sample exhaust gas is dried before the emissions are analysed)	USEPA Method 4	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>
Temperature	USEPA Method 4	<ul style="list-style-type: none"> <li>• CAPCS</li> <li>• CHP</li> <li>• ASP</li> </ul>

With reference to the EM&A Manual, the air emission of the stacks shall meet the following emission limits as presented in *Tables 3.2 to 3.5*.

**Table 3.2** *Emission Limit for CAPCS Stack*

Parameter	Emission Level (mg/Nm <sup>3</sup> ) <sup>(a)</sup>
VOCs (including methane)	680
Dust (or Total Suspended Particulates (TSP))	6
Odour (including NH <sub>3</sub> & H <sub>2</sub> S)	220 <sup>(b)</sup>
<b>Notes:</b>	
(a) Hourly average concentration	
(b) The odour unit is OU/Nm <sup>3</sup>	

**Table 3.3** *Emission Limit for CHP Stack*

Parameter	Maximum Emission Level (mg/Nm <sup>3</sup> ) <sup>(a) (b)</sup>
Dust (or Total Suspended Particulates)	15
Carbon Monoxide	650
NO <sub>x</sub>	300
SO <sub>2</sub>	50
NMVOCs <sup>(c)</sup>	150
VOCs (including methane) <sup>(d)</sup>	1,500
HCl	10
HF	1
<b>Notes:</b>	
(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.	
(b) Hourly average concentration	
(c) NMVOCs should be monitored by gas sampling and laboratory analysis at an agreed interval. For the first 12 months (starting from August 2019), monitoring should be carried out at quarterly intervals. The monitoring frequency should then be reduced to half-yearly for next 12 months (starting from August 2020).	

Parameter	Maximum Emission Level (mg/Nm <sup>3</sup> ) (a) (b)
(d) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.	

**Table 3.4** *Emission Limit for ASP Stack*

Parameter	Maximum Emission Level (mg/Nm <sup>3</sup> ) (a) (b)
Dust (or Total Suspended Particulates)	5
Carbon Monoxide	100
NO <sub>x</sub>	200
SO <sub>2</sub>	50
VOCs (including methane) (c)	20
NH <sub>3</sub>	35
HCl	10
HF	1

**Notes:**

- (a) All values refer to an oxygen content in the exhaust gas of 11% and dry basis.
- (b) Hourly average concentration
- (c) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.

**Table 3.5** *Emission Limit for Standby Flaring Gas Unit* <sup>(1)</sup>

Parameter	Maximum Emission level (mg/Nm <sup>3</sup> ) (a) (b)
Dust (or Total Suspended Particulates)	5
Carbon Monoxide	100
NO <sub>x</sub>	200
SO <sub>2</sub>	50
VOCs (including methane) (c)	20
HCl	10
HF	1

**Notes:**

- (a) All values refer to an oxygen content in the exhaust gas of 11% and dry basis.
- (b) Hourly average concentration
- (c) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.

### 3.1.2 Odour

To determine the effectiveness of the proposed odour mitigation measures and to ensure that the operation of the ORRC1 will not cause adverse odour impacts, odour monitoring of the CAPCS stack (see *Section 3.1.1*) and odour patrol will be carried out.

Odour patrol shall be conducted by independent trained personnel/ competent persons in summer months (i.e. from July to September) for the first two operational years of ORRC1 at monthly intervals along an odour

(1) A standby facility. Only operate when the CHPs are not in operation or when the biogas generated exceeded the utilisation rate of the CHPs.



patrol route at the Project Site boundary as shown in *Annex A*<sup>(1)</sup>.

The perceived odour intensity is divided into 5 levels. *Table 3.6* describes the odour intensity for different levels.

**Table 3.6** *Odour Intensity Level*

Level	Odour Intensity
0	Not detected. No odour perceived or an odour so weak that it cannot be easily characterised or described
1	Slight identifiable odour, and slight chance to have odour nuisance
2	Moderate identifiable odour, and moderate chance to have odour nuisance
3	Strong identifiable, likely to have odour nuisance
4	Extreme severe odour, and unacceptable odour level

*Table 3.7* shows the action level and limit level to be used for odour patrol. Should any exceedance of the action and limit levels occurs, actions in accordance with the event and action plan in *Table 3.8* should be carried out.

**Table 3.7** *Action and Limit Levels for Odour Nuisance*

Parameter	Action Level	Limit Level
Odour Nuisance (from odour patrol)	When one documented compliant is received <sup>(a)</sup> , or Odour Intensity of 2 is measured from odour patrol.	Two or more documented complaints are received <sup>(a)</sup> within a week; or Odour intensity of 3 or above is measured from odour patrol.
<b>Note:</b>		
(a) Once the complaint is received by the Project Proponent (EPD), the Project Proponent would investigate and verify the complaint whether it is related to the potential odour emission from the ORRC1 and its on-site wastewater treatment unit.		

**Table 3.8** *Event and Action Plan for Odour Monitoring*

Event	Action	
	Person-in-charge of Odour Monitoring	Project Proponent <sup>(a)</sup>
Action Level		
Exceedance of action level (Odour Patrol)	<ol style="list-style-type: none"> <li>1. Identify source/reason of exceedance;</li> <li>2. Repeat odour patrol to confirm finding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 weeks;</li> <li>2. Rectify any unacceptable practice;</li> <li>3. Implement more mitigation measures if necessary;</li> <li>4. Inform Drainage Services Department (DSD) or the operator of the Siu Ho Wan Sewage Treatment Works (SHWSTW) if exceedance is considered to be caused by</li> </ol>

(1) The odour patrol route was changed during this reporting period to include sampling points that are frequently visited by visitors and eliminate sampling points that are not visited by visitors.

Event	Action	
	Person-in-charge of Odour Monitoring	Project Proponent <sup>(a)</sup>
Exceedance of action level (Odour Complaints)	<ol style="list-style-type: none"> <li>1. Identify source/reason of exceedance;</li> <li>2. Carry out odour patrol to determinate odour intensity.</li> </ol>	<p>the operation of the SHWSTW.</p> <ol style="list-style-type: none"> <li>5. Inform North Lantau Refuse Transfer Station (NLTS) operator if exceedance is considered to be caused by the operation of NLTS.</li> </ol>
		<ol style="list-style-type: none"> <li>1. Carry out investigation and verify the complaint whether it is related to potential odour emission from the nearby SHWSTW;</li> <li>2. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 weeks;</li> <li>3. Rectify any unacceptable practice;</li> <li>4. Implement more mitigation measures if necessary;</li> <li>5. Inform DSD or the operator of the SHWSTW if exceedance is considered to be caused by the operation of the SHWSTW.</li> <li>6. Inform NLTS operator if exceedance is considered to be caused by the operation of NLTS.</li> </ol>
<b>Limit Level</b>		
Exceedance of limit level	<ol style="list-style-type: none"> <li>1. Identify source/reason of exceedance;</li> <li>2. Inform EPD;</li> <li>3. Repeat odour patrol to confirm findings;</li> <li>4. Increase odour patrol frequency to bi-weekly;</li> <li>5. Assess effectiveness of remedial action and keep EPD informed of the results;</li> <li>6. If exceedance stops, cease additional odour patrol.</li> </ol>	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 week;</li> <li>2. Rectify any unacceptable practice;</li> <li>3. Formulate remedial actions;</li> <li>4. Ensure remedial actions properly implemented;</li> <li>5. If exceedance continues, consider what more/enhanced mitigation measures should be implemented;</li> <li>6. Inform DSD or the operator of the SHWSTW if exceedance is considered to be caused by the operation of the SHWSTW.</li> </ol>
<b>Note:</b>		
(a) Project Proponent shall identify an implementation agent.		

### 3.2

#### *SITE AUDIT*

Environmental mitigation measures (related to air quality, water quality, waste, land contamination, hazard-to-life, and landscape and visual) to be implemented during the operation phase of the Project are recommended in the approved EIA Report and EM&A Manual and are summarised in *Annex D*. Monthly site audits for operation phase will be carried out to check the implementation of these measures.

### 3.2.1 *Water Quality*

Compliance audits are to be undertaken to ensure that a valid discharge licence has been issued by EPD prior to the discharge of effluent from the operation of the Project site. The audit shall be conducted to ensure that the effluent quality is in compliance with the discharge licence requirements. The effluent quality shall meet the discharge limits as described in *Table 3.9*.

**Table 3.9** *Discharge Limits for Effluent*

<b>Parameters</b>	<b>Discharge Limit (mg/L)</b>
Flow Rate (m <sup>3</sup> /day)	685
pH (pH units)	6-10 (a)
Suspended Solids	800
Biochemical Oxygen Demand (5 days, 20°)	800
Chemical Oxygen Demand	2,000
Oil & Grease	40
Total Nitrogen	200
Total Phosphorus	50
Surfactants (total)	25

**Note:**  
(a) Range.

### 3.2.2 *Landscape and Visual*

In accordance with EM&A Manual, the landscape and visual mitigation measures shall be implemented.

For operation phase, site inspection shall be conducted once a month for the first year of operation of the Project. All measures as stated in the implementation schedule of the EM&A Manual (see *Annex D*), including compensatory planting, undertaken by both the Contractor and the specialist Landscape Sub-Contractor during the first year of the operation phase shall be audited by a Registered Landscape Architect (RLA) to ensure compliance with the intended aims of the measures and the effectiveness of the mitigation measures. After the one-year maintenance period, the landscape maintenance and monitoring shall be carried out by the Contractor.

## 4 MONITORING RESULTS

### 4.1 AIR QUALITY

#### 4.1.1 Commissioning Phase Monitoring

Monitoring results of air quality parameters from stack emissions of the centralised air pollution control system, the ammonia stripping plant and the cogeneration units will be provided once available to show compliance with the monitoring requirements stated in the EM&A Manual (Rev. F) to support the termination of the commissioning phase EM&A programme.

#### 4.1.2 Operation Phase Monitoring

The concentrations of concerned air pollutants emitted from the stacks of the CAPCS, CHP, and ASP during the reporting period are monitored on-line by the continuous environmental monitoring system (CEMS). During the reporting period, there is no need to operate the standby flare and therefore no monitoring of the flare stack was undertaken.

With reference to the emission limits shown in *Tables 3.2, 3.3 and 3.4*, the hourly average concentrations and the number of exceedances of the concerned air emissions monitored for the CAPCS, CHP and ASP during this reporting period are presented in *Tables 4.1 to 4.5*.

It should be noted that measurements recorded under abnormal operating conditions, e.g. start up and stopping of stacks, unstable operation, test runs and interference of sensor, are disregarded.

**Table 4.1** *Hourly Average of Parameters Recorded for CAPCS*

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> )	Emission Limit (mg/Nm <sup>3</sup> )	Exceedance Identified	Remarks
VOCs (including methane)	8.92 - 16.23	680	Nil	Nil
Dust (or TSP)	0.00 - 1.36	6	Nil	Nil
Odour (including NH <sub>3</sub> & H <sub>2</sub> S) <sup>(a)</sup>	0.27 - 184.90	220	Nil	Nil

**Note:**  
(a) The odour unit is OU/Nm<sup>3</sup>.

**Table 4.2** *Hourly Average of Parameters Recorded for CHP 1*

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) <sup>(a)</sup>	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedance Identified	Remarks
Dust (or TSP)	0 – 1	15	Nil	Nil
Carbon Monoxide	0 – 487	650	Nil	Nil
NO <sub>x</sub>	0 – 366	300	Identified <sup>(d)</sup>	System unstable (e.g. low efficiency, unstable column temperature )
SO <sub>2</sub>	0 – 173	50	Identified <sup>(e)</sup>	Disruption of power supply <sup>(f)</sup> . Desulphurisation system tripped and resumed to normal after urgent maintenance <sup>(g)</sup> .
NMVOCs <sup>(b)</sup>	Nil	150	-	Nil
VOCs (including methane) <sup>(c)</sup>	0 – 1,099	1,500	Nil	Nil
HCl	0 – 1	10	Nil	Nil
HF	0 – 1	1	Nil	Nil

**Notes:**

- (a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.
- (b) No sampling was undertaken at CHP 1 as biogas production rate could not sustain the operation of the CHP stack for the scheduled sampling on 8 February 2021.
- (c) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.
- (d) Dates with exceedances on NO<sub>x</sub> (number of exceedances on the day) were identified on 4 (1), 10 (1), 13 (4), 14 (4), 18 (1), 19 (2), 20 (2) and 29 (2) June 2021.
- (e) Dates with exceedances on SO<sub>2</sub> (number of exceedances on the day) were identified on 7 (8) and 22 (3) June 2021.
- (f) On 7 June 2021.
- (g) On 22 June 2021.

**Table 4.3** *Hourly Average of Parameters Recorded for CHP 2*

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) <sup>(a) (b)</sup>	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedance Identified	Remarks
Dust (or TSP)	0 – 4	15	Nil	Nil
Carbon Monoxide	0 – 571	650	Nil	Nil
NO <sub>x</sub>	0 – 305	300	Identified <sup>(d)</sup>	System unstable (e.g. low efficiency, unstable column temperature )
SO <sub>2</sub>	0 – 146	50	Identified <sup>(e)</sup>	Disruption of power supply <sup>(f)</sup> . Desulphurisation system tripped and resumed to normal after urgent maintenance. <sup>(g)</sup>

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) (a) (b)	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedance Identified	Remarks
NMVOCs (b)	6.0	150	Nil	Nil
VOCs (including methane) (c)	0 - 1,062	1,500	Nil	Nil
HCl	0 - 0	10	Nil	Nil
HF	0 - 1	1	Nil	Nil

**Notes:**

(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.

(b) Bi-annual sampling of NMVOCs was conducted in CHP 2 on 8 February 2021. No exceedance was identified.

(c) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.

(d) Date with exceedances on NO<sub>x</sub> (number of exceedances on the day) was identified on 7 (3) and 8 (5) June 2021.

(e) Date with exceedances on SO<sub>2</sub> (number of exceedances on the day) was identified on 7 (7) and 22 (4) June 2021.

(f) On 7 June 2021.

(g) On 22 June 2021.

**Table 4.4** *Hourly Average of Parameters Recorded for CHP 3*

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) (a)	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedances Identified	Remarks
Dust (or TSP)	0 - 11	15	Nil	Nil
Carbon Monoxide	0 - 160	650	Nil	Nil
NO <sub>x</sub>	0 - 479	300	Identified (d)	System unstable (e.g. low efficiency, unstable column temperature )
SO <sub>2</sub>	0 - 76	50	Identified (e)	Desulphurisation system tripped and resumed to normal after urgent maintenance (f).
NMVOCs (b)	Nil	150	Nil	Nil
VOCs (including methane) (c)	0 - 1,695	1,500	Identified (g)	System unstable (e.g. low efficiency, unstable column temperature )
HCl	0 - 6	10	Nil	Nil
HF	0 - 2	1	Identified (h)	System unstable (e.g. low efficiency, unstable column temperature )

**Notes:**

(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.

(b) No sampling was undertaken at CHP 3 as biogas production rate could not sustain the operation of the CHP stack for the scheduled sampling on 8 February 2021.

(c) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.

(d) Dates with exceedances on NO<sub>x</sub> (number of exceedances on the day) were identified on 8

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) <sup>(a)</sup>	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedances Identified	Remarks
			(7), 13 (1), 14 (13), 15 (9), 17 (3), 22 (2), 23 (5), 24 (13), 25 (1) and 30 (1) June 2021.	
(e)			Dates with exceedances on SO <sub>2</sub> (number of exceedances on the day) were identified on 22 (1) June 2021.	
(f)			On 22 June 2021.	
(g)			Dates with exceedances on VOC (number of exceedances on the day) were identified on 8 (1), 13 (2), 14 (7), 15 (6), 23 (1) and 30 (2) June 2021.	
(h)			Date with exceedances on HF (number of exceedances on the day) was identified on 17 (1) June 2021.	

**Table 4.5** *Hourly Average of Parameters Recorded for ASP*

Parameter	Range of Hourly Average Conc. (mg/Nm <sup>3</sup> ) <sup>(a)</sup>	Max. Emission Limit (mg/Nm <sup>3</sup> )	Exceedances Identified	Remarks
Dust (or TSP)	0.0 - 0.0	5	Nil	Nil
Carbon Monoxide	0 - 106	100	Identified <sup>(c)</sup>	System instability due to unstable column temperature.
NO <sub>x</sub>	0 - 267	200	Identified <sup>(d)</sup>	System instability due to unstable column temperature.
SO <sub>2</sub>	0 - 43	50	Nil	Nil
VOCs (including methane) <sup>(b)</sup>	0 - 11	20	Nil	Nil
NH <sub>3</sub>	0 - 204	35	Identified <sup>(e)</sup>	System instability due to unstable column temperature.
HCl	0 - 0	10	Nil	Nil
HF	0 - 1	1	Nil	Nil

**Notes:**

- (a) All values refer to an oxygen content in the exhaust gas of 11% and dry basis.
- (b) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.
- (c) Date with exceedances on CO (number of exceedances on the day) was identified on 6 (1) June 2021.
- (d) Dates with exceedances on NO<sub>x</sub> (number of exceedances on the day) were identified on 6 (1), 8 (1), 14 (1) and 17 (1) June 2021.
- (e) Dates with exceedances on NH<sub>3</sub> (number of exceedances on the day) was identified on 6 (5), 7 (8), 8 (2), 9 (9), 10 (5), 11 (5), 12 (4), 13 (15), 14 (15), 15 (9), 16 (15), 17 (7), 18 (14), 19 (10), 23 (1), 28 (1) and 29 (4) June 2021.

## 4.2 ODOUR

### 4.2.1 Operation Phase Monitoring

No odour patrol was required to be conducted for this reporting period.

## 4.3 WATER QUALITY

### 4.3.1 Operation Phase Monitoring

Effluent discharge was sampled monthly from the Effluent Storage Tank as stipulated in the operation phase discharge licence. The results of the discharge sample is recorded in *Table 4.6*.

**Table 4.6 Results of the Discharge Sample**

Parameters	Discharged Effluent Concentration (mg/L)	Discharge Limit (mg/L)	Compliance with Discharge Limit
pH (pH units)	7.94 - 8.36	6-10 <sup>(a)</sup>	Yes
Suspended Solids <sup>(b)</sup>	237	800	Yes
Biochemical Oxygen Demand (5 days, 20°) <sup>(b)</sup>	48	800	Yes
Chemical Oxygen Demand <sup>(b)</sup>	1,340	2,000	Yes
Oil & Grease <sup>(b)</sup>	<5	40	Yes
Total Nitrogen <sup>(b)</sup>	102	200	Yes
Total Phosphorus <sup>(b)</sup>	40.6	50	Yes
Surfactants (total) <sup>(b)</sup>	<1.0	25	Yes

**Notes:**

(a) Daily Average.

(b) Effluent sample was collected on 10 June 2021.

No exceedance of discharge limit was recorded during the reporting period.

## 4.4 WASTE MANAGEMENT

### 4.4.1 Operation Phase Monitoring

Wastes generated from the operation of the Project include chemical waste, wastes generated from pre-treatment process and general refuse <sup>(1)</sup>. Reference has been made to the Monthly Summary Waste Flow Table prepared by the Contractor (see *Annex E*). With reference to the relevant handling records and trip tickets of this Project, the quantities of different types of waste generated from the operation of the Project in the reporting month are summarised in *Table 4.7*.

(1) Public fill and construction waste may only be generated during maintenance works when there are civil or structural works.



**Table 4.7 Quantities of Waste Generated from the Operation of the Project**

Month/Year	Chemical Waste	Waste Generated from Pre-treatment Process		General Refuse	
		Disposed of at Landfill <sup>(a)</sup>	Recycled <sup>(b)</sup>	Disposed of at Landfill <sup>(a)</sup>	Recycled <sup>(c)</sup>
June 2021	0 L	558.72 tonnes	0.00 tonnes	2.88 tonnes <sup>(d)</sup>	0.00 tonne

**Notes:**

- (a) Waste generated from pre-treatment process and general refuse other than chemical waste and recyclables were disposed of at NENT Landfill by sub-contractors.
- (b) Among waste generated from pre-treatment process, 0.00 tonne of metals, 0.00 tonne of papers/ cardboard packing and 0.00 tonne of plastics were sent to recyclers for recycling during the reporting period.
- (c) Among general refuse, 0.00 kg of metals, 0.00 kg of papers/ cardboard packing and 0.00 kg of plastics were sent to recyclers for recycling during the reporting period.
- (d) It was assumed that four 240-litre bins filled with 80% of general refuse were collected at each collection. The general refuse density was assumed to be around 0.15 kg/L.

## 5 *SITE AUDIT*

### 5.1 *ENVIRONMENTAL SITE AUDIT*

#### 5.1.1 *Operation Phase*

The monthly inspection for the operation phase of the Project on 18 June 2021 covered the operation phase environmental site audit. Joint site inspection was conducted by representatives of the Contractor, IEC, and the MT on 18 June 2021 as required for the operation of the Project.

The audits checked the implementation of the recommended mitigation measures for air quality, landscape and visual, water quality, waste (land contamination) and hazard-to-life stated in the Implementation Schedule (see *Annex D*).

Follow-up actions resulting from the last site inspections were generally taken as reported by the Contractor.

Key observations during the reporting period are summarised as follows:

18 June 2021

- No particular observation during this inspection.

Other than the above observations, the Contractor has implemented environmental mitigation measures recommended in the approved EIA Report and EM&A Manual.

### 5.2 *LANDSCAPE AND VISUAL AUDIT*

Inspection of the landscape and visual mitigation measures for the operation phase of the Project was performed on 18 June 2021.

It was confirmed that the necessary landscape and visual mitigation measures during the operation phase as summarised in *Annex D* were generally implemented by the Contractor. No specific observation was found during the joint site inspection on 18 June 2021. No non-compliance in relation to the landscape and visual mitigation measures was identified during the site audits in this reporting period and therefore no further actions are required. The ET/MT will keep track of the EM&A programme to check compliance with environmental requirements and the proper implementation of all necessary mitigation measures.

## 6.1

## SUMMARY OF ENVIRONMENTAL NON-COMPLIANCE AND DEFICIENCIES

Non-compliance of emission limits for CHP and ASP were recorded during the reporting period.

The Contractor has reviewed the organic waste treatment processes (i.e. waste reception, waste pre-treatment, anaerobic digesters, and composting processes) and found that they were operated normally during the reporting period. The Contractor has investigated the air pollution control system and the combustion system of the CHP and ASP and identified the following potential causes for the exceedance.

- (a) The exceedances from CHP 1 and 2 occurred mainly when the feedstock quantity was at 40-60% of the optimal treatment quantity <sup>(1)</sup>, which could hinder the performance of the CHPs to achieve optimal efficiency. Therefore, they could not effectively remove NO<sub>x</sub> at a certain period of time which leads to the exceedance of NO<sub>x</sub> limit at the CHP;
- (b) The exceedances of NO<sub>x</sub>, VOC and HF limits at CHP 3 occurred due to equipment tripping and its unstable performance;
- (c) The exceedances of SO<sub>2</sub> limit at the CHPs occurred due to equipment tripping of the desulphurisation system and disruption of power supply <sup>(2)</sup>;
- (d) The ASP was experiencing unstable column temperature in the thermal oxidiser, which resulted in the incomplete combustion of biogas and NH<sub>3</sub>. These have led to the exceedances of CO, NO<sub>x</sub> and NH<sub>3</sub> in ASP.

For item (a), insufficient biogas available for CHP 1 and 2 has been identified as a key reason that led to the reduced performance of the CHP, resulting in emission exceedances from the CHP. As advised by the Contractor, it is more desirable that the plant can receive at least 150 tonnes of SSOW daily in order to generate sufficient biogas for the CHP to be able to operate at optimal efficiency. In this reporting period, the plant has received on average around 154 tonnes of SSOW daily, which is more than received in the last reporting period. As a result, the total hours of exceedance from all CHPs have dropped from 193 hours to 123 hours since the last reporting period. Yet, exceedances from the CHPs occurred when the quantity of SSOW was lower than the desirable quantity. The Contractor will continue to liaise with EPD (Food Waste Recycling Group) in their monthly meeting with an aim to

(1) Although the SSOW input has been increased in this reporting month (an average of 154 tonne per day), there are still low quantity of SSOW on some of the days, which lead to exceedance of NO<sub>x</sub> limit.

(2) On 7 June, power disruption occurred during electricity connection maintenance carried out by CLP.

explore the possibility of increasing the quantity of SSOW that can be treated daily.

For item (b), unstable performance of the CHP 3 has led to exceedances of NO<sub>x</sub>. Although the Contractor was advised to halt the use of CHP 3 in this reporting period due to its unstable performance, it was used when CHP 2 was under urgent maintenance as it requires to operate 2 CHPs to utilise the biogas generated. An on-site inspection of CHP 2 was carried out on 14 June by the supplier representative, whereas the inspection and overhaul of CHP 3 is scheduled in July. Prior to the overhaul of CHP 3, its use will be avoided as much as possible.

For item (c), The SO<sub>2</sub> exceedances recorded in CHPs were due to power disruption and tripping of the desulphurisation system, which were stopped temporary for urgent maintenance. The desulphurisation system resumed to normal operation after the provision of power resumed to normal and on the day after urgent maintenance.

For item (d), the exceedances of CO, NO<sub>x</sub> and NH<sub>3</sub> were found to be due to unstable column temperature in the thermal oxidiser for biogas combustion, which have led to incomplete combustion of biogas and NH<sub>3</sub> and hence exceedances in ASP. The Contractor has carried out temperature fine-tuning of the thermal oxidiser to optimise its performance. The Contractor will continue to carry out maintenance measures as per the supplier's manual. The Contractor will continue to work with the overseas ASP supplier to investigate the reasons for the occasional equipment tripping that has led to unstable column temperature of the thermal oxidizer and, subject to their investigations, replacement of some ASP equipment and/or increased maintenance frequency may be proposed. The investigation report is presented in *Annex G*.

## **6.2** *SUMMARY OF ENVIRONMENTAL COMPLAINT*

No complaint was received during the reporting period.

## **6.3** *SUMMARY OF ENVIRONMENTAL SUMMON AND SUCCESSFUL PROSECUTION*

No summon/prosecution was received during the reporting period. The cumulative summons/prosecution log is shown in *Annex F*.

## 7 *FUTURE KEY ISSUES*

### 7.1 *KEY ISSUES FOR THE COMING MONTH*

Activities to be undertaken for the coming reporting period are:

- Operation of the Project.
- Modification of the CHP and ASP to control the air emission.

This EM&A Report presents the EM&A programme undertaken during the reporting period from **1 to 30 June 2021** in accordance with EM&A Manual (Version F) and requirements of EP (FEP-01/395/2010/C).

For the operation phase, exceedances of the emission limits for CHP and ASP stack monitoring were recorded under normal operating conditions during the reporting period (see *Table 8.1*).

**Table 8.1** *Exceedances for Stack Emissions*

Stack	Exceedances During the Reporting Period
Cogeneration Unit (CHP)	<ul style="list-style-type: none"> <li>• Exceeded emission limit of NO<sub>x</sub> on 4, 7, 8, 10, 13, 14, 15, 17, 18, 19, 20, 22, 23, 24, 25, 29 and 30 June 2021.</li> <li>• Exceeded emission limit of SO<sub>2</sub> on 7 and 22 June 2021.</li> <li>• Exceeded emission limit of VOCs on 13, 14, 15, 23 and 30 June 2021.</li> <li>• Exceeded emission limit of HF on 17 June 2021.</li> </ul>
Ammonia Stripping Plant (ASP)	<ul style="list-style-type: none"> <li>• Exceeded emission limit of CO on 6 June 2021.</li> <li>• Exceeded emission limit of NO<sub>x</sub> on 6, 8, 14 and 17 June 2021.</li> <li>• Exceeded emission limit of NH<sub>3</sub> on 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 28 and 29 June 2021.</li> </ul>

Exceedances in emission parameters of CHP were found to be a result of the occasional low biogas loading at the CHPs and unstable performance of CHP 3. The exceedances of ASP were found to be result of incomplete combustion of biogas at ASP.

The Contractor has implemented mitigation measures to control the exceedance including the continuous monitoring of CHP and ASP to optimise overall performance.

No non-compliance to the effluent discharge limit was recorded during this reporting period.

The environmental control /mitigation measures related to air quality, water quality, waste (including land contamination prevention), hazard-to-life and landscape and visual recommended in the approved EIA Report and the EM&A Manual were properly implemented by the Contractor during the reporting month.

Monthly landscape and visual monitoring were conducted in the reporting period. The necessary landscape and visual mitigation measures recommended in the approved EIA Report were generally implemented by the Contractor.

No complaint/summon/prosecution was received.

## EXECUTIVE SUMMARY

The construction works of *No. EP/SP/61/10 Organic Resources Recovery Centre Phase 1 (the Project)* commenced on 21 May 2015. This is the 73<sup>rd</sup> monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 to 30 June 2021 in accordance with the EM&A Manual. Substantial completion of the construction works was confirmed on 3 December 2018. In the meantime, the operation phase EM&A programme had commenced in March 2019. Substantial Completion in respect of substantial part of the Works was confirmed on 24 February 2020. The construction phase EM&A programme was completed in the end of February 2020.

### **Summary of Works undertaken during the Reporting Month**

Works undertaken in the reporting month included:

- Operation of the Project, including organic waste reception, and operation of the pre-treatment facilities, anaerobic digesters, composting facilities, air pollution control systems, on-line emission monitoring system for the Centralised Air Pollution Control Unit (CAPCS), Co-generation Units (CHP)s and Ammonia Stripping Plant (ASP), and the wastewater treatment plant; and
- Process fine-tune, including adjustment of the ASP with new treatment media, modification of Continuous Environmental Monitoring System (CEMS) and Supervisory Control and Data Acquisition System (SCADA) rectification and improvement works following equipment failures and the alteration of different operation modes and measures to adapt to the high variation of SSOW nature and sources.

### **Environmental Monitoring and Audit Progress**

#### *Air Quality Monitoring*

Exceedances on NO<sub>x</sub>, SO<sub>2</sub>, VOC and HF from CHP and CO, NO<sub>x</sub> and NH<sub>3</sub> from ASP were recorded on the on-line monitoring system. It should be noted that measurements recorded under abnormal operating conditions, e.g. start up and stopping of stacks, unstable operation, test runs and interference of sensor, are disregarded.

Exceedances in emission parameters of CHP were found to be a result of low biogas loading and unstable performance at CHP. The exceedances of ASP were found to be a result of incomplete combustion of biogas at ASP.

The Contractor has implemented mitigation measures to control the exceedance including regular maintenance of the CHP by the supplier and regular fine-tuning, finding better and more feedstock to increase biogas loading and testing at ASP to optimise combustion efficiency and overall performance.

The Contractor is recommended to closely monitor the processes of the modification of the CHP and ASP and the post-modification monitoring of emission level to avoid any exceedance.

#### *Water Quality*

No non-compliance to the effluent discharge limit stipulated in the discharge licence issued by the EPD under the *Water Pollution Control Ordinance* was recorded during this reporting period.

#### *Waste Management*

Waste generated from the operation of the Project includes chemical waste, waste generated from pre-treatment process and general refuse.

0 L of chemical waste was collected by licenced waste collector from the operation of the Project.

588.72 tonnes of waste generated from pre-treatment process from the operation of the Project was disposed of at landfill. Among the recyclable waste generated from pre-treatment process from the operation of the Project, 0.00 tonne of metals, 0.00 tonnes of papers/ cardboard packing and 0.00 tonne of plastics were sent to recyclers for recycling during the reporting period.

Around 2.88 tonnes of general refuse from the operation of the Project was disposed of at landfill. Among the recycled general refuse from the operation of the Project, 0.00 tonne of metals, 0.00 tonne of papers/ cardboard packing and 0.00 tonne of plastics were sent to recyclers for recycling during the reporting period.

#### **Findings of Environmental Site Audit**

A summary of the monitoring activities undertaken in this reporting period is listed below:

- Joint Environmental Site Inspections 1 time

1 monthly joint environmental site inspection was carried out by the representatives of the Contractor and the MT. The IEC was also present at the joint inspections on 18 June 2021. The environmental control/ mitigation measures (related to air quality, water quality, waste (including land contamination prevention), hazard-to-life and landscape and visual) recommended in the approved EIA Report and the EM&A Manual were properly implemented by the Contractor during the reporting month.

#### **Environmental Exceedance/Non-conformance/Compliant/Summons and Prosecution**

Exceedances for the air emission limits for the CHP and ASP stacks were recorded during the reporting period.

No complaint/ summon/prosecution was received in this reporting period.



### **Future Key Issues**

Activities to be undertaken in the next reporting month include:

- Operation of the Project.
- Modification of the CHP and ASP to control the air emission.



# CONTENTS

## EXECUTIVE SUMMARY

1	INTRODUCTION	1
1.1	PURPOSE OF THE REPORT	1
1.2	STRUCTURE OF THE REPORT	1
2	PROJECT INFORMATION	3
2.1	BACKGROUND	3
2.2	GENERAL SITE DESCRIPTION	4
2.3	MAJOR ACTIVITIES UNDERTAKEN	4
2.4	PROJECT ORGANISATION AND MANAGEMENT STRUCTURE	4
2.5	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	4
3	ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS	6
3.1	ENVIRONMENTAL MONITORING	6
3.1.1	<i>Air Quality</i>	6
3.1.2	<i>Odour</i>	8
3.2	SITE AUDIT	10
3.2.1	<i>Water Quality</i>	11
3.2.2	<i>Landscape and Visual</i>	11
4	MONITORING RESULTS	12
4.1	AIR QUALITY	12
4.1.1	<i>Commissioning Phase Monitoring</i>	12
4.1.2	<i>Operation Phase Monitoring</i>	12
4.2	ODOUR	15
4.2.1	<i>Operation Phase Monitoring</i>	15
4.3	WATER QUALITY	16
4.3.1	<i>Operation Phase Monitoring</i>	16
4.4	WASTE MANAGEMENT	16
4.4.1	<i>Operation Phase Monitoring</i>	16
5	SITE AUDIT	18
5.1	ENVIRONMENTAL SITE AUDIT	18
5.1.1	<i>Operation Phase</i>	18
5.2	LANDSCAPE AND VISUAL AUDIT	18
6	ENVIRONMENTAL NON-CONFORMANCE AND DEFICIENCIES	19
6.1	SUMMARY OF ENVIRONMENTAL NON-COMPLIANCE AND DEFICIENCIES	19
6.2	SUMMARY OF ENVIRONMENTAL COMPLAINT	20
6.3	SUMMARY OF ENVIRONMENTAL SUMMON AND SUCCESSFUL PROSECUTION	20
7	FUTURE KEY ISSUES	21

7.1	<i>KEY ISSUES FOR THE COMING MONTH</i>	21
8	<i>CONCLUSIONS</i>	22

### *LIST OF TABLES*

<i>TABLE 2.1</i>	<i>SUMMARY OF ACTIVITIES UNDERTAKEN IN THE REPORTING PERIOD</i>
<i>TABLE 2.2</i>	<i>SUMMARY OF ENVIRONMENTAL LICENSING, NOTIFICATION AND PERMIT STATUS</i>
<i>TABLE 3.1</i>	<i>SAMPLING AND LABORATORY ANALYSIS METHODOLOGY</i>
<i>TABLE 3.2</i>	<i>EMISSION LIMIT FOR CAPCS STACK</i>
<i>TABLE 3.3</i>	<i>EMISSION LIMIT FOR CHP STACK</i>
<i>TABLE 3.4</i>	<i>EMISSION LIMIT FOR ASP STACK</i>
<i>TABLE 3.5</i>	<i>EMISSION LIMIT FOR STANDBY FLARING GAS UNIT<sup>0</sup></i>
<i>TABLE 3.6</i>	<i>ODOUR INTENSITY LEVEL</i>
<i>TABLE 3.7</i>	<i>ACTION AND LIMIT LEVELS FOR ODOUR NUISANCE</i>
<i>TABLE 3.8</i>	<i>EVENT AND ACTION PLAN FOR ODOUR MONITORING</i>
<i>TABLE 3.9</i>	<i>DISCHARGE LIMITS FOR EFFLUENT</i>
<i>TABLE 4.1</i>	<i>HOURLY AVERAGE OF PARAMETERS RECORDED FOR CAPCS</i>
<i>TABLE 4.2</i>	<i>HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 1</i>
<i>TABLE 4.3</i>	<i>HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 2</i>
<i>TABLE 4.4</i>	<i>HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 3</i>
<i>TABLE 4.5</i>	<i>HOURLY AVERAGE OF PARAMETERS RECORDED FOR ASP</i>
<i>TABLE 4.6</i>	<i>RESULTS OF THE DISCHARGE SAMPLE</i>
<i>TABLE 4.7</i>	<i>QUANTITIES OF WASTE GENERATED FROM THE CONSTRUCTION OF THE PROJECT</i>
<i>TABLE 4.8</i>	<i>QUANTITIES OF WASTE GENERATED FROM THE OPERATION OF THE PROJECT</i>

### *LIST OF ANNEXES*

<i>ANNEX A</i>	<i>LOCATION OF PROJECT</i>
<i>ANNEX B</i>	<i>PROJECT ORGANISATION CHART AND CONTACT DETAIL</i>
<i>ANNEX C</i>	<i>CALIBRATION CERTIFICATION FOR THE ON-LINE STACK MONITORING SYSTEM</i>
<i>ANNEX D</i>	<i>IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES</i>
<i>ANNEX E</i>	<i>WASTE FLOW TABLE</i>
<i>ANNEX F</i>	<i>ENVIRONMENTAL COMPLAINT, ENVIRONMENTAL SUMMONS AND PROSECUTION LOG</i>
<i>ANNEX G</i>	<i>INVESTIGATION REPORT</i>