# Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1)

## Fortieth Quarterly EM&A Summary Report

PREPARED FOR
OSCAR Bioenergy Joint Venture

DATE
4 December 2025

REFERENCE
0279222

Meinhardt Infrastructure and Environment Limited

# Organic Resources Recovery Centre, Phase I

## 40th Quarterly EM&A Report

## (1 Mar 2025 – 31 May 2025)

| | |
|---|---|
| Verified by: | Claudine Lee  |
| Position: | Independent Environmental Checker |
| Date: | 12th December 2025 |

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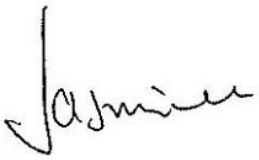
SIGNATURE PAGE

# Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1)

## Fortieth Quarterly EM&A Summary Report

0279222



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# 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 40th Quarterly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 March 2025 to 31 May 2025 in accordance with the EM&A Manual.

## ENVIRONMENTAL MONITORING AND AUDIT PROGRESS

### AIR QUALITY MONITORING

Non-compliance of emission limits of $NO_x$ and HCl from CHP1; $NO_x$ from CHP3; $NO_x$, $SO_2$, $NH_3$ and HCl from the ASP; and HF from the Standby Gas Flaring Unit were recorded during March 2025.

Non-compliance of emission limits of Dust and Total Odour from CAPCS; $NO_x$ from CHP1; $NO_x$ from CHP3 and $NO_x$, $SO_2$, $NH_3$ and HCl from the ASP were recorded during April 2025.

Non-compliance of emission limits of Total Odour from CAPCS; $NO_x$ from CHP1; $NO_x$ from CHP2; $NO_x$, $SO_2$ and HCl from CHP3; $NO_x$, $SO_2$, $NH_3$, and HCl from the ASP; and $NO_x$, $SO_2$, VOC, HCl and HF from Standby Gas Flaring Unit were recorded during May 2025.

Exceedances occurred due to system instability, equipment tripped (stopped and restarted) and normal equipment start up process/ stopping process (1-3hrs), and ASP tripping.

## ENVIRONMENTAL EXCEEDANCE/ NON-CONFORMANCE/ COMPLIANT/ SUMMONS AND PROSECUTION

Exceedances for the air emission limits for the CAPCS, CHP, ASP stacks, and Standby Gas Flaring Unit were recorded during the reporting period.

No complaint was received during the reporting period.

# 1. PROJECT INFORMATION

## 1.1 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.

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.

## 1.2 GENERAL SITE DESCRIPTION

The Project Site is located at Siu Ho Wan in North Lantau with an area of about 2 hectares. The facility received an average of 84.09 to 96.93 tonnes and treated an average of 64.84 to 80.60 tonnes of source separated organic waste per day during the reporting period.

### 1.2.1 MAJOR ACTIVITIES UNDERTAKEN

A summary of the major activities undertaken in the reporting period is shown in *Table 1.1.*

TABLE 1.1 SUMMARY OF ACTIVITIES UNDERTAKEN IN THE REPORTING PERIOD

| Activities Undertaken in the Reporting Period |
|---|
| • Operation of the Project, including organic waste reception, 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;<br>• Cleaning of combustion chamber of CHP2; and<br>• Cleaning of SBT. |

# 2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS AND RESULTS

## 2.1 ENVIRONMENTAL MONITORING

### 2.1.1 AIR QUALITY

The concentrations of concerned air pollutants emitted from the stacks of the CAPCS, CHP, ASP and Standby Flaring Gas Unit during the reporting period are monitored on-line by the continuous environmental monitoring system (CEMS). The number of exceedances of the concerned air emissions monitored for the CAPCS, CHP, ASP and Standby Flaring Gas Unit during this reporting period are presented in *Tables 2.1* to *2.6*.

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

TABLE 2.1 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CAPCS

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) | Emission Limit (mg/Nm$^3$) | Exceedance Identified | Remarks |
|---|---|---|---|---|
| VOCs (including methane) [(a)] | 0 – 67 | 680 | Nil | Nil |
| Dust (or TSP) | 0 – 9 | 6 | Identified [(c)] | System unstable (e.g., low efficiency) |
| Odour (including $NH_3$ & $H_2S$) [(b)] | 0 – 975 | 220 | Identified [(d)] | System unstable (e.g., low efficiency) |

**Notes:**
(a) The VOCs emission limit includes methane as biogas is adopted, as fuel in the combustion process.
(b) The odour unit is OU/Nm$^3$.
(c) Dates with Dust exceedances (number of exceedances on that day) were identified on 11(1) and 27(2) April 2025.
(d) Dates with Odour exceedances (number of exceedances on that day) were identified on 9(7), 10(4), 11(1), 12(3), 13(7), 14(7), 15(2), 16(3), 19(2), 20(11), 21(6), 22(5), 23(6), 24(11), 25(3), 28(2) and 30(2) April 2025; and 2(1), 4(3), 5(4), 6(4), 7(5), 12(4), 13(1), 16(13), 17(11), 18(1), 19(2) and 21(5) May 2025 .

TABLE 2.2 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 1

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedance Identified | Remarks |
|---|---|---|---|---|
| Dust (or TSP) | 0 – 14 | 15 | Nil | Nil |
| Carbon Monoxide | 0 – 650 | 650 | Nil | Nil |
| $NO_x$ | 0 – 506 | 300 | Identified [(c)] | System unstable (e.g., low efficiency) |
| $SO_2$ | 0 – 45 | 50 | Nil | Nil |
| VOCs (including methane) [(b)] | 0 – 1,397 | 1,500 | Nil | Nil |
| HCl | 0 – 82 | 10 | Identified [(d)] | System unstable (e.g., low efficiency) |
| 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) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with $NO_x$ exceedances (number of exceedances on that day) were identified on 14(5), 15(5), 16(6), 17(1), 18(9), 19(21), 20(24), 21(15), 24(10), 25(10) and 26(16) March 2025; 14(3), 17(6), 19(2) and 24(1) April 2025; and 23(7), 24(24), 25(24), 26(14), 27(13), 28(9), 29(8), 30(11) and 31(1) May 2025.
(d) Date with HCl exceedance (number of exceedance on that day) was identified on 16(1) March 2025.

## TABLE 2.3 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 2

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedance Identified | Remarks |
|---|---|---|---|---|
| Dust (or TSP) | 0 – 15 | 15 | Nil | Nil |
| Carbon Monoxide | 0 – 650 | 650 | Nil | Nil |
| $NO_x$ | 0 – 410 | 300 | Identified [(c)] | System unstable (e.g., low efficiency) |
| $SO_2$ | 0 – 50 | 50 | Nil | Nil |
| VOCs (including methane) [(b)] | 0 – 528 | 1,500 | Nil | Nil |
| HCl | 0 – 8 | 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) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with $NO_x$ exceedances (number of exceedances on the day) were identified on 22(3) and 23(7) May 2025.

## TABLE 2.4 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 3

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedances Identified | Remarks |
|---|---|---|---|---|
| Dust (or TSP) | 0 – 9 | 15 | Nil | Nil |
| Carbon Monoxide | 0 – 277 | 650 | Nil | Nil |
| $NO_x$ | 0 – 682 | 300 | Identified [(c)] | System unstable (e.g., low efficiency) |
| $SO_2$ | 0 – 71 | 50 | Identified [(d)] | System unstable (e.g., low efficiency) |
| VOCs (including methane) [(b)] | 0 – 1,051 | 1,500 | Nil | Nil |
| HCl | 0 – 126 | 10 | Identified [(e)] | System unstable (e.g., low efficiency) |
| 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) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with $NO_x$ exceedances (number of exceedances on the day) were identified on 1(4), 2(1), 4(2), 5(4), 6(5), 7(3), 8(1), 9(5), 11(1), 12(6), 13(17), 14(3), 16(2), 17(14), 18(13), 21(4), 22(6), 23(11), 24(3), 25(1), 27(8), 28(6), 29(8), 30(16) and 31(16) March 2025; 1(14), 2(16), 3(18), 4(15), 5(19), 6(11), 7(6), 8(8), 9(12), 10(16), 11(14), 12(19), 13(23), 14(16), 15(10), 16(16), 17(12), 18(17), 19(16), 20(22), 21(20), 22(21), 23(18), 24(16), 25(7), 26(2), 28(6), 29(15) and 30(2) April 2025; and 3(1), 4(11), 5(17), 6(9), 7(9), 8(19), 9(16), 10(13), 11(9), 12(19), 13(24), 14(23), 15(18), 16(20), 17(24), 18(17), 19(15), 20(18), 21(24), 22(11), 23(18), 24(7), 25(4), 26(5), 27(9), 28(11), 29(21), 30(22) and 31(14) May 2025.
(d) Dates with $SO_2$ exceedances (number of exceedances on the day) were identified on 3(1), 4(1), 9(1), 10(2), 15(3) and 20(1) May 2025.
(e) Dates with HCl exceedances (number of exceedances on that day) were identified on 3(1), 4(6), 5(3), 6(1), 7(2), 9(1), 10(2), 14(1) and 15(1) May 2025.

## TABLE 2.5 HOURLY AVERAGE OF PARAMETERS RECORDED FOR ASP

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedances Identified | Remarks |
|---|---|---|---|---|
| Dust (or TSP) | 0 – 5 | 5 | Nil | Nil |
| Carbon Monoxide | 0 – 99 | 100 | Nil | Nil |
| $NO_x$ | 0 – 1,794 | 200 | Identified [(c)] | System unstable (e.g., low efficiency), Equipment Tripped (Stopped and Restarted) and Normal Equipment Start-up Process / stopping Process (1-3hr), ASP tripping |
| $SO_2$ | 0 – 244 | 50 | Identified [(d)] | System unstable (e.g., low efficiency), ASP tripping |
| VOCs (including methane) [(b)] | 0 – 20 | 20 | Nil | Nil |
| $NH_3$ | 0 – 340 | 35 | Identified [(e)] | System unstable (e.g., low efficiency), ASP tripping |
| HCl | 0 – 50 | 10 | Identified [(f)] | System unstable (e.g., low efficiency), ASP tripping |
| 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) Dates with $NO_x$ exceedances (number of exceedances on the day) were identified on 1(21), 2(17), 3(20), 4(16), 5(23), 6(13), 7(22), 8(24), 9(10), 10(10), 11(16), 12(5), 21(2), 22(12), 23(15), 24(13), 25(8), 26(12), 27(16), 28(22), 29(22), 30(20) and

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedances Identified | Remarks |
|---|---|---|---|---|

31(13) March 2025; 1(23), 2(19), 3(15), 4(24), 5(21), 6(12), 7(15), 8(17), 9(20), 10(21), 11(18), 12(24), 13(24), 14(24), 15(19), 16(23), 17(17), 18(24), 19(24), 20(24), 21(22), 22(21), 23(24), 24(24), 25(24), 26(24), 27(24), 28(21), 29(19) and 30(22) April 2025; and 1(7), 2(2), 3(8), 4(21), 5(13), 6(23), 7(23), 8(21), 9(22), 10(21), 11(21), 12(15), 13(19), 14(23), 15(22), 16(18), 17(23), 18(24), 19(24), 20(16), 21(24), 22(24), 23(23), 24(24), 25(24), 26(19), 27(12), 28(19), 29(19), 30(23) and 31(22) May 2025.

(d) Dates with $SO_2$ exceedances (number of exceedances on the day) were identified on 25(1) and 26(1) March 2025; 3(1), 19(2), 23(2), 24(1), 28(1) and 30(2) April 2025; and 1(8), 2(2), 3(8), 4(23), 5(4), 6(1), 9(1), 10(4), 11(17), 12(15), 13(15), 14(21), 15(21), 16(18), 17(19), 18(20), 19(19), 20(16), 21(23), 22(17), 25(1), 28(4) and 29(1) May 2025.

(e) Dates with $NH_3$ exceedances (number of exceedances on the day) were identified on 1(4), 2(1), 3(2), 5(1), 9(1), 10(2), 11(6), 12(1), 23(10), 24(7), 25(4), 27(3), 28(3) and 29(1) March 2025; 3(3) 7(3), 9(1), 11(1), 16(2), 18(1), 19(6), 21(2), 23(8), 24(3), 25(1), 26(1) and 28(3) April 2025; and 4(2), 6(4), 7(1), 9(3), 10(3), 11(5), 12(2), 13(2), 14(1), 15(7), 17(3), 19(4), 20(1), 22(5), 23(2), 24(2), 25(2), 28(8) and 29(2) May 2025.

(f) Dates with HCl exceedances (number of exceedances on the day) were identified on 25(1) March 2025; 3(1), 19(1), 23(1), 24(1) and 28(1) April 2025; and 1(6), 2(2), 3(2), 6(1), 9(1), 12(1), 22(4), 25(1) and 28(2) May 2025.

TABLE 2.6 HOURLY AVERAGE OF PARAMETERS RECORDED FOR THE STANDBY FLARING GAS UNIT

| Parameter | Range of Hourly Average Conc. (mg/Nm$^3$) [(a)] | Max. Emission Limit (mg/Nm$^3$) | Exceedances Identified | Remarks |
|---|---|---|---|---|
| Dust (or TSP) | 0 – 0 | 5 | Nil | Nil |
| Carbon Monoxide | 0 – 12 | 100 | Nil | Nil |
| $NO_x$ | 0 – 1,402 | 200 | Identified [(c)] | Normal Equipment start up process/ stopping process (1-3hrs) |
| $SO_2$ | 0 – 62 | 50 | Identified [(d)] | Normal Equipment start up process/ stopping process (1-3hrs) |
| VOCs (including methane) [(b)] | 0 – 5,761 | 20 | Identified [(e)] | Normal Equipment start up process/ stopping process (1-3hrs) |
| HCl | 0 – 239 | 10 | Identified [(f)] | Normal Equipment start up process/ stopping process (1-3hrs) |
| HF | 0 – 5 | 1 | Identified [(g)] | Normal Equipment start up process/ stopping process (1-3hrs) |

**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 $NO_x$ exceedances (number of exceedances on that day) were identified on 15(6) May 2025.

(d) Date with $SO_2$ exceedance (number of exceedance on that day) was identified on 15(1) May 2025.

(e) Date with VOC exceedances (number of exceedances on that day) was identified on 15(6) May 2025.

(f) Date with HCl exceedances (number of exceedances on that day) was identified on 15(6) May 2025.

(g) Dates with HF exceedances (number of exceedances on that day) were identified on 16(4) and 26(1) March 2025; and 15(6) May 2025.

### 2.1.2 ODOUR

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

## 2.2 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. Monthly site audits for March 2025 to May 2025 have been carried out to check the implementation of these mitigation measures. Follow-up actions resulting from the site audits were generally taken as reported by the Contractor. The Contractor has implemented environmental mitigation measures recommended in the approved EIA Report and EM&A Manual.

## 2.3 LANDSCAPE AND VISUAL

The monthly inspections of the landscape and visual mitigation measures for the operation phase of the Project were performed on 26 March 2025, 22 April 2025 and 30 May 2025, and no non-compliance in relation to the landscape and visual mitigation measures were identified.

## 2.4 WASTE MANAGEMENT

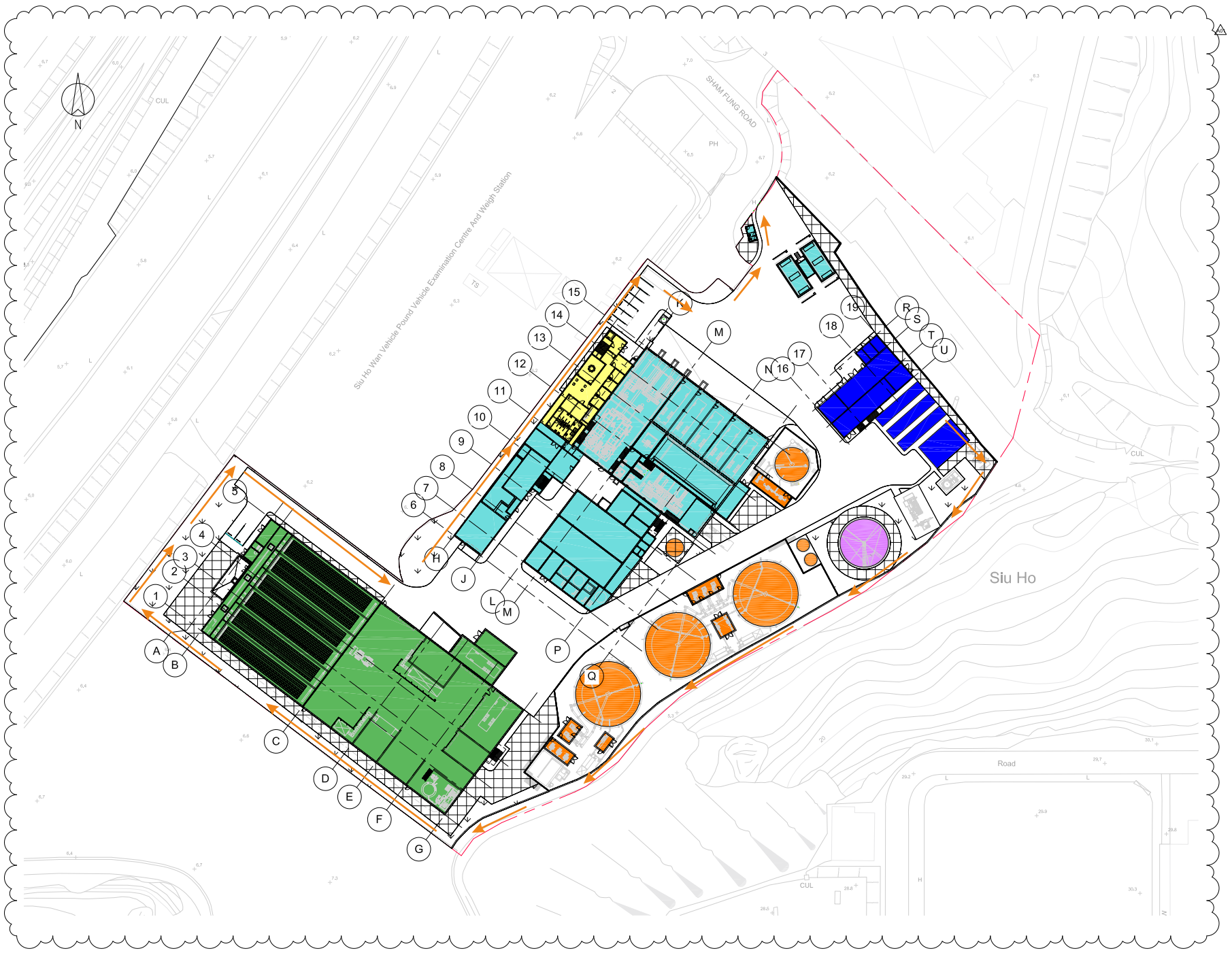
Wastes generated from the operation of the Project include chemical waste, wastes generated from pre-treatment process and general refuse. The quantities of different types of waste generated from the operation of the Project in the reporting period are summarised in *Table 2.7.*

### TABLE 2.7 QUANTITIES OF WASTE GENERATED FROM THE OPERATION OF THE PROJECT

| Month / Year | Chemical Waste | Waste Generated from Pre-treatment Process | | General Refuse | |
|---|---|---|---|---|---|
| | Disposal of at CWTC | Disposed of at Landfill [a] | Recycled [b] | Disposed of at Landfill [a] [e] | Recycled [c] |
| March 2025 | 34,800 L [d] | 548.97 tonnes | 0 tonnes | 2.995 tonnes [e] | 0.031 tonnes |
| April 2025 | 0 L [d] | 616.80 tonnes | 0 tonnes | 2.534 tonnes [e] | 0.039 tonnes |
| May 2025 | 0 L [d] | 506.36 tonnes | 0 tonnes | 2.765 tonnes [e] | 0.054 tonnes |

**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, no metals, papers/ cardboard packing or plastics were sent to recyclers for recycling during the reporting period.
(c) Among general refuse, 0.002 tonnes of metals, 0.106 tonnes of papers/ cardboard packing and 0.016 tonnes of plastics were sent to recyclers for recycling during the reporting period.
(d) 34,800 L of chemical waste (30,000 L of unwanted flocculation agent and 4,800 L of spent activated carbon) were disposed of at CWTC in March 2025, no chemical waste was disposed of at CWTC in April 2025 and May 2025.
(e) 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.

# ANNEX A PROJECT LAYOUT




**Key**

→ Patrol Route

| REV | DATE | BY | APP | DESCRIPTION |
|---|---|---|---|---|
| A01 | 05/03/15 | CW | MB | IMTECH BACKGROUNDS UPDATED |
| A00 | 18/02/15 | CW | MB | DRAFT ISSUE |

CLIENT

ENVIRONMENTAL PROTECTION DEPARTMENT
GOVERNMENT OF THE HKSAR

CLIENT'S CONSULTANT

AECOM ASIA CO. LTD.

CONTRACTOR

OSCAR BIOENERGY JV

LEAD DESIGNER

ARUP
Ove Arup & Partners Hong Kong Limited

ENVIRONMENTAL TEAM

ERM HONG KONG LIMITED

INDEPENDENT CONSULTANTS

Meinhardt Infrastructure and Environment Limited
滙techn基建環保工程顧問有限公司

PROJECT

ORGANIC WASTE TREATMENT FACILITIES
PHASE 1
EP/SP/61/10

STATUS

DRAFT ISSUE

DRAWING TITLE

SITE LAYOUT

| DRAWN | CHECKED | APPROVED |
|---|---|---|
| CW | RS | DP |

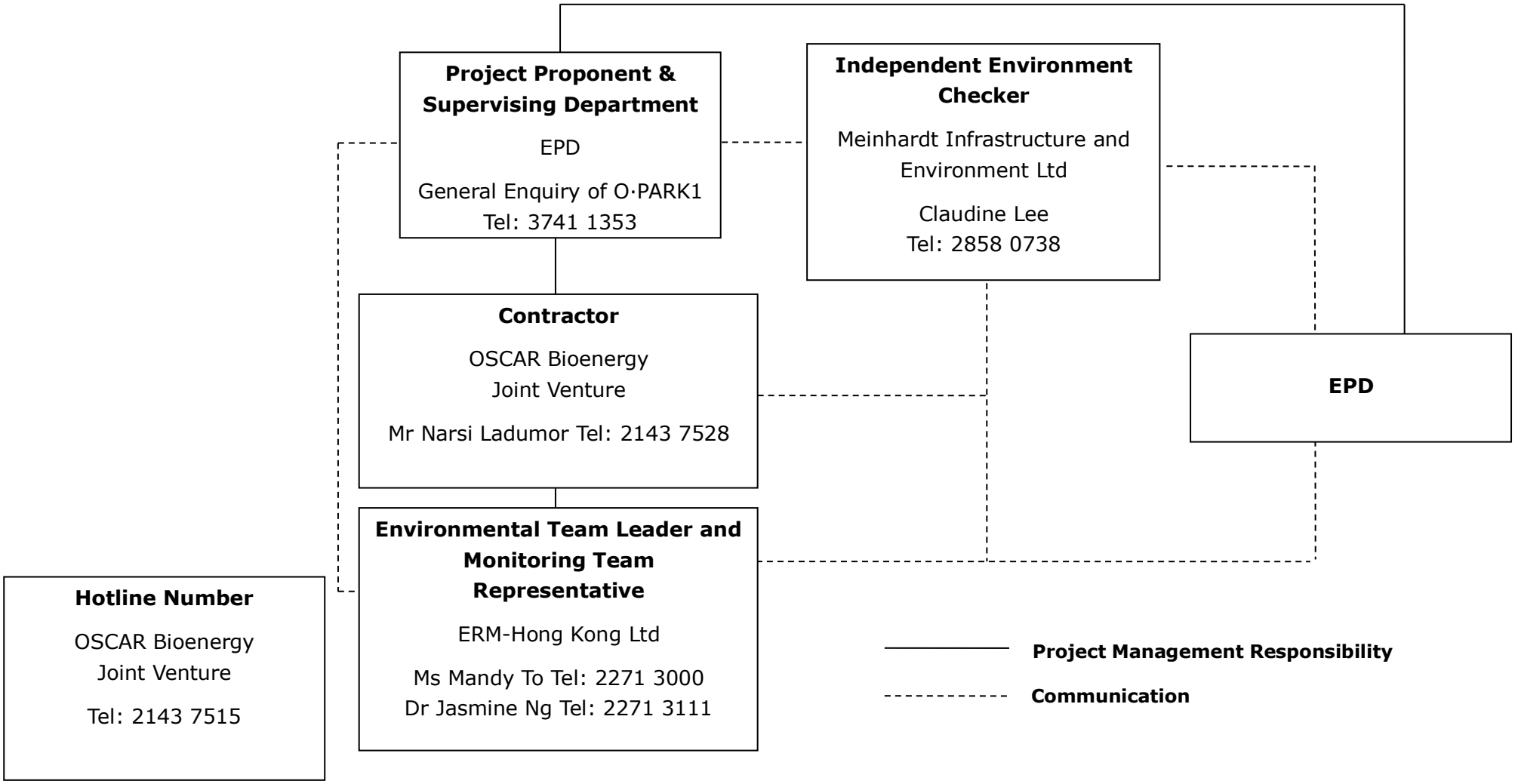
SCALE 1:500@A1 / 1:1000@A3

DATE 12/02/15

| JOB NO. | DRAWING NO. | REV. |
|---|---|---|
| 239956 | DR-OAP-20-0-CA-1001 | A01 |

# ANNEX B PROJECT ORGANISATION CHART AND CONTACT DETAIL

# PROJECT ORGANISATION (WITH CONTACT DETAILS)



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