



EM&A Report

# EcoPark Operation

## Annual EM&A Compliance Report

January to December 2010





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**January to December 2010**

**Certified By**      **Antony WONG**  
ET Leader

A handwritten signature in black ink, appearing to read "Antony", written above a horizontal line.

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Principal EPO

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## CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>E-1</b>
<b>1 PROJECT DESCRIPTION.....</b>	<b>1-1</b>
1.1 Overview.....	1-1
1.2 Operation Programme.....	1-1
1.3 EM&A Organisation.....	1-2
<b>2 SUMMARY OF EM&amp;A REQUIREMENTS.....</b>	<b>2-1</b>
2.1 Monitoring Parameters.....	2-1
2.2 Environmental Quality Performance Limits and EAP.....	2-1
2.3 Environmental Audit of Non-Monitored Parameters.....	2-2
2.4 Environmental Mitigation Measures.....	2-2
2.5 Environmental Requirements in Tenancy Agreements.....	2-2
<b>3 OPERATION STATUS.....</b>	<b>3-1</b>
3.1 Tenants and Processes.....	3-1
3.2 Throughput Statistics.....	3-3
<b>4 IMPLEMENTATION STATUS OF ENVIRONMENTAL PROTECTION MEASURES.....</b>	<b>4-1</b>
<b>5 MONITORING RESULTS .....</b>	<b>5-1</b>
5.1 Monitoring Date, Time, Frequency and Duration.....	5-1
5.2 Monitoring Methodology, Parameters and Equipment.....	5-1
5.3 Types of Equipment Used and Calibration Details.....	5-2
5.4 Results and Graphical Plots of Monitoring Parameters.....	5-2
<b>6 WASTE GENERATION STATISTICS .....</b>	<b>6-1</b>
<b>7 SUMMARY OF ENVIRONMENTAL AUDIT .....</b>	<b>7-1</b>
7.1 January 2010.....	7-1
7.2 February 2010.....	7-1
7.3 March 2010.....	7-2
7.4 April 2010.....	7-2
7.5 May 2010.....	7-3
7.6 June 2010.....	7-4
7.7 July 2010.....	7-4
7.8 August 2010.....	7-5
7.9 September 2010.....	7-6
7.10 October 2010.....	7-7
7.11 November 2010.....	7-8
7.12 December 2010.....	7-9

<b>8</b>	<b>COMPLAINTS</b> .....	<b>8-1</b>
<b>9</b>	<b>ANNUAL REVIEW</b> .....	<b>9-1</b>
9.1	Interpretation of EM&A Data .....	9-1
9.2	Environmental Acceptability of EcoPark .....	9-1
9.3	Monitoring Methodology .....	9-1
9.4	Practicality and Effectiveness of EIA Process and EM&A Programme .....	9-1
<b>10</b>	<b>CONCLUSIONS</b> .....	<b>10-1</b>

## APPENDICES

Appendix 1	Environmental Mitigation Measures (from the Implementation Schedule)
Appendix 2	Environmental Requirements in Tenancy Agreement
Appendix 3	Material and Waste Throughputs
Appendix 4	Calibration Certificate of Infrared Gas Analyser
Appendix 5	Graphical Plots of LFG Monitoring

## TABLES

Table 1-1	Personnel Contact Names and Contact Numbers for the Project
Table 2-1	Operation Phase LFG Monitoring Locations in EcoPark Phase 1
Table 2-2	Action Levels, Limit Levels and Event and Action Plan for LFG
Table 5-1	Sampling Schedule of LFG Monitoring
Table 5-2	Parameters and Measurement Ranges of LFG Monitoring
Table 5-3	LFG Monitoring Results

## FIGURES

Figure 1-1	Location of EcoPark in Tuen Mun Area 38
Figure 1-2	SGJV Organisation
Figure 1-3	EM&A Organisation
Figure 2-1	LFG Monitoring Locations within EcoPark Phase 1
Figure 2-2	EcoPark and Siu Lang Shui Landfill ( <i>Replacement for Figure 6.1 of EM&amp;A Manual</i> )
Figure 3-1	Current Lot Usage Within EcoPark

## EXECUTIVE SUMMARY

### General

EcoPark is a key element in the Government's waste management policy that aims to promote the local recycling industry and jump-start a circular economy to provide a sustainable solution to our waste problems.

EcoPark has been developed in two phases (Phase 1 and Phase 2) under construction contract *EP/SP/52/06 Development of EcoPark in Tuen Mun Area 38*, which was awarded to Kaden Construction by the Environmental Protection Department (EPD) in June 2006. Phase 1 construction was completed in July 2009 and Phase 2 construction was completed in November 2010. The seven-year contract for the operation of EcoPark *EP/SP/53/06 Provision of Management Services for EcoPark in Tuen Mun Area 38* was awarded to Serco Guardian Joint Venture (SGJV) by EPD in November 2006.

Effective from August 2010 onwards, SGJV ("the Operator") has appointed SMEC Asia Ltd (SMEC) as the Environmental Team (ET) for the Environmental Monitoring and Audit (EM&A) works, replacing the previous ET who were engaged by SGJV from May 2007 to July 2010. Throughout 2010 EPD has engaged Scott Wilson Ltd (Scott Wilson) as the Independent Environmental Checker (IEC) for the EM&A works. The ET and the IEC carry out the EM&A works for EcoPark as required by the EM&A Manual and in accordance with the conditions of the Environmental Permit.

This is the fourth annual EM&A report prepared for the operation phase of EcoPark and covers January to December 2010.

The tenants' recycling activities are to be audited on a monthly basis and the results are to be summarised in this report. By end-December 2010, there were eight tenants in EcoPark:

#### 1. Phase 1

- Champway Technology Limited (Champway) – waste cooking oil;
- Shiu Wing Steel Limited (Shiu Wing) – waste metals;
- Hong Kong Hung Wai Wooden Board Company (Hung Wai) – waste wood;
- Li Tong Group (Li Tong) – Waste Electrical and Electronic Equipment (WEEE);
- Hong Kong Telford Envirotech Group Limited (Telford) – waste plastics; and
- Cosmos Star Holdings Co., Limited (Cosmos) – waste lead-acid batteries.

#### 2. Phase 2

- Yan Oi Tong Limited (Yan Oi Tong) – waste plastics; and
- St. James' Settlement (St James') – waste electrical and electronic equipment (WEEE).

The ET has conducted monthly site inspections and some general observations have been made. The IEC has made quarterly site inspections with the ET. The approved checklist has been used in the monthly site inspections for various tenants since October 2009.

## Throughput of Materials / Waste Generated

As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Two tenants, Telford and Cosmos, have not commenced full recycling activities as they are still constructing their premises, however Telford commenced trial commissioning on 4 November 2010. The following throughputs occurred during the reporting period:

1. **Champway.** 1,347,001kg of cooking oil and 1,146,700kg of grease-trap waste were delivered to the site, producing 2,248,350kg of treated cooking oil, 1,922,170kg of biodiesel and 83,563kg of glycerine. A total of 337,459kg of waste was generated, including 95,976kg of inorganic waste, 143,449kg of organic waste and 98,034kg of water waste (semi-solid and slurry inclusive).
2. **Shiu Wing.** 4,561,540kg of waste metal was delivered to and processed at the tenant lot, producing the same amount of sheared heavy ferrous scrap on site. No waste was generated.
3. **Hung Wai.** 4,492,330kg of waste wood was delivered to and processed at the site, resulting in 4,285,120kg of wood chips as product output. No waste was generated.
4. **Li Tong.** 85,175kg of WEEE was delivered to the site, producing 9,172kg of metals and 33,607kg of non-metals. No waste was generated.
5. **Telford.** Although formal recycling activities are not currently being carried out, 123,600kg of waste plastics were delivered. Telford commenced trial commissioning on 4 November 2010.
6. **Cosmos.** No recycling activities are being carried out and no waste has been delivered.
7. **Yan Oi Tong.** 615,178kg of waste plastics was received and 405,834kg was processed. 110,994kg of general refuse was generated from mixed waste plastics.
8. **St. James' Settlement.** 41,400kg of WEEE was delivered to the site, producing 5,880 units of repaired / refurbished Electrical and Electronic Equipment (EEE) and 1,925kg of general refuse.

## Exceedances of any Measured Action / Limit Levels

In terms of monitoring during operation phase EM&A, only quarterly monitoring of landfill gas (LFG) is required "following construction". Construction of Phase 1 was completed in July 2009, so LFG monitoring commenced in the next reporting quarter (August to October 2009). Construction of Phase 2 was completed in November 2010, so LFG monitoring commenced in the next reporting quarter (November 2010 to January 2011).

LFG monitoring during 2010 was undertaken on 25 January, 28 April, 26 July and 27 October. No Action/Limit Level exceedances were recorded.

## Summary of Complaints, Summons and Prosecutions

Numbers of complaints, summons and successful prosecutions are summarized below:

- Zero Complaints;
- Zero Summons; and
- Zero Successful Prosecutions.

## Reporting Changes

Since August 2010, SMEC have taken over as the ET for the EM&A works, replacing the previous ET who were engaged by SGJV from May 2007 to July 2010. There is, however, no change in the ET Leader, who remains as Mr Antony WONG. The content of this EM&A report is similar to that prepared previously so as to provide continuity and compatibility with previous reports.

## Future Key Issues

By end of this reporting period, two tenants of Phase 1, Telford and Cosmos had not commenced full recycling activities but were carrying out preparatory works within their lots. After commencing trial commissioning on 4 November 2010, Telford are expected to commence formal recycling activities in the first quarter of 2011.

In terms of monitoring during operation phase EM&A, only quarterly monitoring of landfill gas (LFG) is required “following construction”. Construction of Phase 2 was completed in November 2010, so LFG monitoring commenced in the next reporting quarter (November 2010 to January 2011).



# 1 PROJECT DESCRIPTION

## 1.1 Overview

In the document "A Policy Framework For The Management Of Municipal Solid Waste (2005-2014)" the government set out a comprehensive policy to support the recycling industry. This included allocating suitable land, encouraging research and development, introducing environmental legislation and providing effective support measures. To this end, EcoPark is a key element that aims to promote the local recycling industry and jump-start a circular economy to provide a sustainable solution to our waste problems. By encouraging and promoting the reuse, recovery and recycling of our waste resources and returning them to the consumption loop, EcoPark will help to realise the full potential of the local recycling industry and alleviate the heavy reliance on the export of recyclable materials recovered from Hong Kong.

EcoPark has been developed in Tuen Mun Area 38 (see **Figure 1-1**) in two phases (Phase 1 and Phase 2) under construction contract *EP/SP/52/06 Development of EcoPark in Tuen Mun Area 38*, which was awarded to Kaden Construction by the Environmental Protection Department (EPD) in June 2006. Phase 1 construction was completed in July 2009 and Phase 2 construction was completed in November 2010. The seven-year contract for the operation of EcoPark *EP/SP/53/06 Provision of Management Services for EcoPark in Tuen Mun Area 38* was awarded to Serco Guardian Joint Venture (SGJV) by EPD in November 2006.

Effective from August 2010 onwards, SGJV ("the Operator") has appointed SMEC Asia Ltd (SMEC) as the Environmental Team (ET) for the Environmental Monitoring and Audit (EM&A) works, replacing the previous ET who were engaged by SGJV from May 2007 to July 2010. Throughout 2010 EPD has engaged Scott Wilson Ltd (Scott Wilson) as the Independent Environmental Checker (IEC) for the EM&A works.

## 1.2 Operation Programme

By the end of December 2010, two tenants, Telford and Cosmos, had commenced preparatory works within their lots. Telford commenced trial commissioning on 4 November 2010. Six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have started recycling activities.

Environmental observations noted during this year's site inspections are detailed in **Section 7**. In summary, these are as follows:

1. **Champway.** Produced a significant amount of biodiesel from waste cooking oil. By the end of December 2010, waste cooking oil/biodiesel was no longer temporarily stored in the area reserved for the EcoPark wastewater treatment Plant (WWTP), next to Telford's lot. The key environmental concerns included chemical drums and oil stains on bare ground, as well as an uncovered waste cooking oil bucket and stagnant pool of water; Champway was reminded to store the chemicals properly, provide secondary containment for this potential source of ground contamination and remove the stagnant water as soon as possible.
2. **Shiu Wing.** Sheared waste ferrous metal into heavy scrap, although the misting (dust control) system and industrial dust collector are not yet in place. No critical environmental issues were observed in Shiu Wing's lot, although Asbestos Containing Materials (ACM) was found to be attached to some waste metal on one

occasion. The tenant engaged Waylung Waste Services Ltd, a licenced collector for ACM, to collect and process the material, which will take place as soon as the Waste Disposal Licence is ready.

3. **Hung Wai.** Shredded large amount of waste wood into wooden chips – the packaging of shredded wood chips generated fugitive dust. Another key environmental concern was the blockage of the surface channel next to the lot boundary. In order to address these environmental issues, it was suggested that the tenant minimise the gap between the outlet and packaging bags and provide regular maintenance to the drainage system.
4. **Li Tong.** Started checking and dismantling WEEE manually. No critical environmental issues were observed and the lot was generally kept tidy.
5. **Yan Oi Tong.** The key environmental concerns were wastewater overflow, waste plastics and refuse in drains as well as general housekeeping (site cleanliness). The tenant was therefore reminded to improve housekeeping, install screen at the drain inlet and provide covers to the surface channels.
6. **St. James' Settlement.** Commenced sorting and checking WEEE. No critical environmental issues were observed, and advice on handling unwanted refrigerants and potential LFG hazards was provided. The lot was generally kept tidy.

Remedial actions were recommended to tenants, and the remedial status shall be followed up in the next monthly site inspection.

### 1.3 EM&A Organisation

The EM&A is carried out by the ET, but SGJV and the Independent Environmental Checker (IEC) are also involved. The key personnel contact names and telephone numbers are summarised in *Table 1-1*.

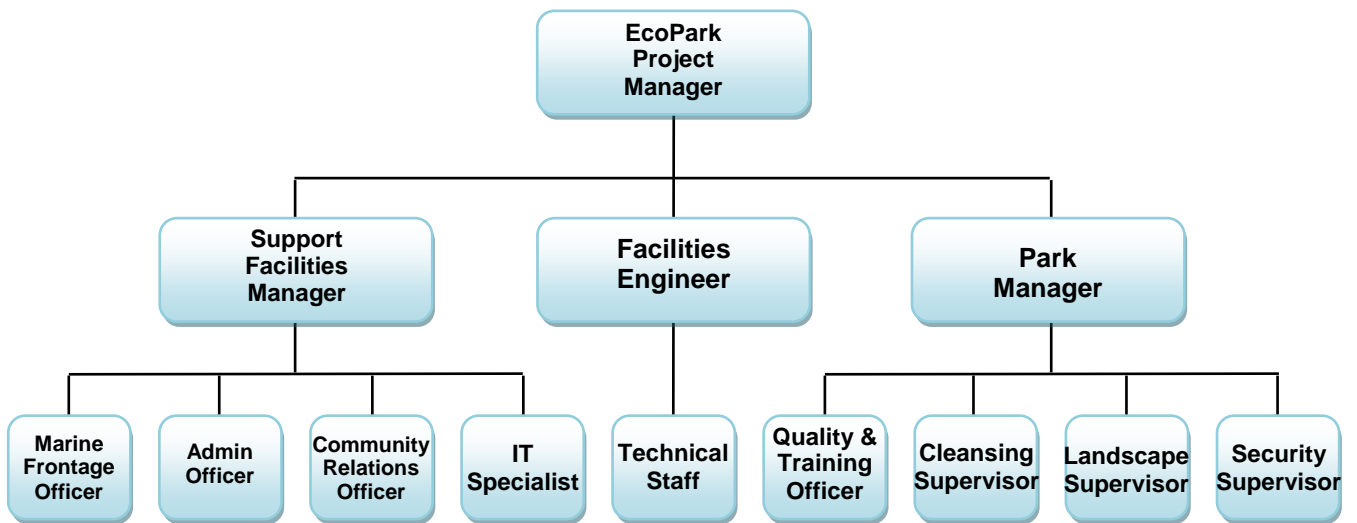
**Table 1-1 Personnel Contact Names and Contact Numbers for the Project**

Position	Name	Email Address	Telephone No.
<b>Project Proponent – EPD</b>			
Principal EPO	Dr Lawrence WONG	lawrwong@epd.gov.hk	2872 1700
<b>Operator – SGJV</b>			
Project Manager	Noel AU	nkfau@ecopark-mgmt.com	2496 7633
Park Manager	Morgan CHIU	morganchiu@ecopark-mgmt.com	2212 5910
<b>ET – SMEC</b>			
ET Leader	Antony WONG	antony.wong@smec.com	3995 8120
ET Site Inspector	Carman CHUNG	carman.chung@smec.com	3995 8138
<b>IEC – Scott Wilson</b>			
IEC	Harold INSLEY	harold.insley@scottwilson.com.hk	2410 3858

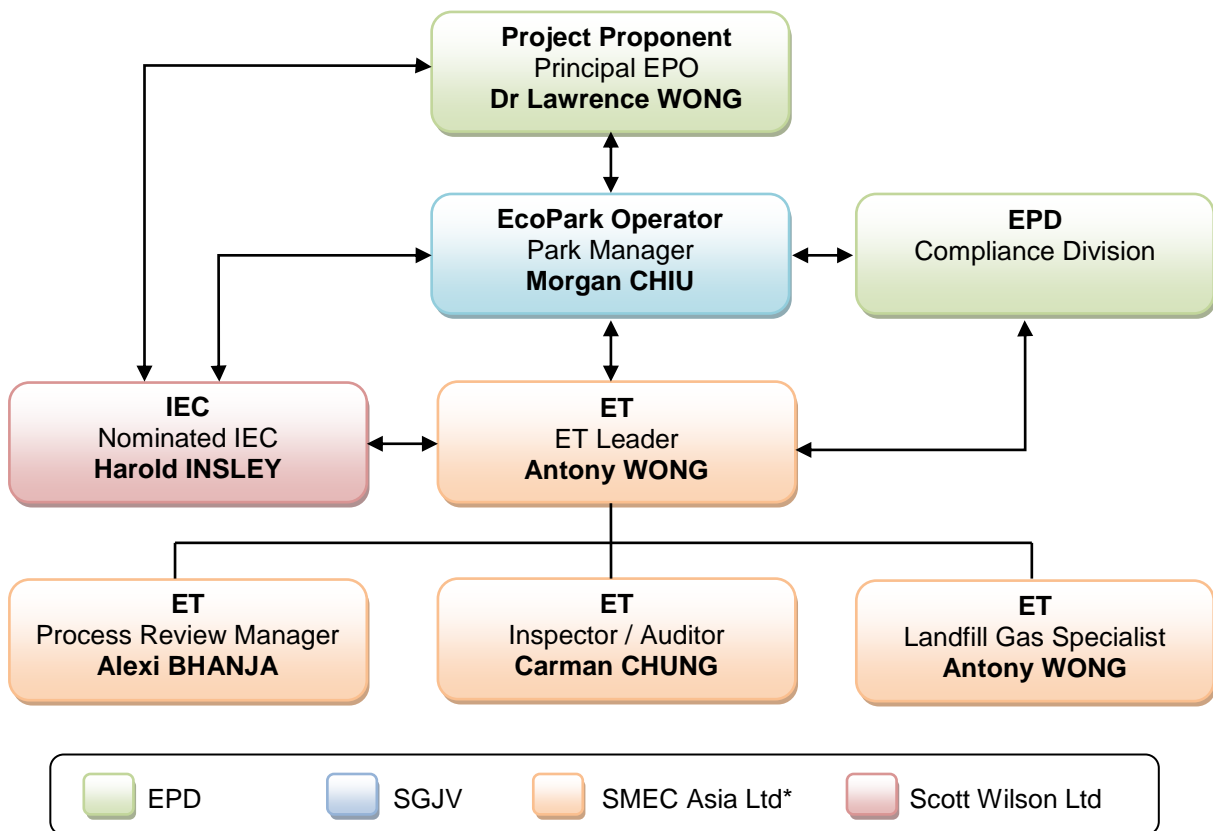
The organisation of SGJV is shown in *Figure 1-2* and the current EM&A organisation is illustrated in *Figure 1-3*.



**Figure 1-2 SGJV Organisation**



**Figure 1-3 EM&A Organisation**



**Note:** \*Effective August 2010

## 2 SUMMARY OF EM&A REQUIREMENTS

### 2.1 Monitoring Parameters

In terms of monitoring during operation phase EM&A, only quarterly monitoring of landfill gas (LFG) is required at service voids and utility boxes “following construction”. This is because part of EcoPark lies within the 250m “LFG consultation zone” for Siu Lang Shui Landfill, which is located to the north of EcoPark. Construction of Phase 1 was completed in July 2009, so LFG monitoring commenced in the next reporting quarter (August to October 2009).

The location for LFG monitoring was not specified in the EM&A Manual since the final design of EcoPark had not been completed when the EM&A Manual was approved. Therefore, during the joint site inspection on 27 July 2009, three monitoring locations were identified and agreed as suitable monitoring locations by the ET, IEC and SGJV. These three monitoring locations are listed in **Table 2-1** and shown in **Figure 2-1**.

**Table 2-1 Operation Phase LFG Monitoring Locations in EcoPark Phase 1**

Monitoring Station ID	Type of Monitoring Station	Locations
EP1-1	LFG vent pipe with cap	Inside the landscaping area of Administration Building
EP1-2	Service void	PCCW below-ground chamber outside Lot EP08-01
EP1-3	Service void	HGC Broadband below-ground chamber outside Lot EP08-03

Figure 6.1 of the EM&A Manual has also been updated and replaced by **Figure 2-2** showing the off-site LFG monitoring locations at Siu Lang Shui Landfill and on-site LFG monitoring at EcoPark.

Routine LFG monitoring at EcoPark has been carried out on a quarterly basis. Should EPD alert the Operator that high LFG levels are detected during monthly monitoring under the Siu Lang Shui Landfill restoration contract, the Operator may be required to increase LFG monitoring to monthly basis until EPD inform the Operator that quarterly monitoring can be resumed.

During 2010, construction phase LFG monitoring for Phase 2 was undertaken as usual and was reported in the Monthly EM&A Reports prepared by the construction contractor’s ET. Reports can be downloaded from:

[http://www.epd.gov.hk/eia/english/register/index8/vep2212006\\_content.html](http://www.epd.gov.hk/eia/english/register/index8/vep2212006_content.html)

Construction of Phase 2 was completed in November 2010, so LFG monitoring commenced in the next reporting quarter (November 2010 to January 2011).

### 2.2 Environmental Quality Performance Limits and EAP

The Action / Limit (AL) Levels and Event Action Plan (EAP) for LFG are shown in **Table 2-2** below. These refer to LFG detected in excavations, utilities and any enclosed on-site areas. No other A/L Levels or EAPs are specified in the EM&A Manual for operation phase EM&A.

**Table 2-2 Action Levels, Limit Levels and Event and Action Plan for LFG**

Parameter	Level	Action
Oxygen (O <sub>2</sub> )	Action Level <19% O <sub>2</sub>	<ul style="list-style-type: none"> <li>Ventilate trench/void to restore O<sub>2</sub> to &gt; 19%</li> </ul>
	Limit Level <18% O <sub>2</sub>	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore O<sub>2</sub> to &gt; 19%</li> </ul>
Methane (CH <sub>4</sub> )	Action Level >10% LEL	<ul style="list-style-type: none"> <li>Post "No Smoking" signs</li> <li>Prohibit hot works</li> <li>Increase ventilation to restore CH<sub>4</sub> to &lt;10% LEL</li> </ul>
	Limit Level >20% LEL	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore CH<sub>4</sub> to &lt;10% LEL</li> </ul>
Carbon Dioxide (CO <sub>2</sub> )	Action Level >0.5% CO <sub>2</sub>	<ul style="list-style-type: none"> <li>Ventilate to restore CO<sub>2</sub> to &lt; 0.5%</li> </ul>
	Limit Level >1.5% CO <sub>2</sub>	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore CO<sub>2</sub> to &lt;0.5%</li> </ul>

## 2.3 Environmental Audit of Non-Monitored Parameters

Site inspections provide a direct means to trigger and enforce the environmental protection and pollution control measures specified in the Environmental Impact Assessment (EIA) Report. To examine operational practice, site inspections are to be undertaken regularly by the ET once per month, and joint site inspections are to be carried out by the ET and IEC once per quarter. Ad hoc site inspections are also carried out if significant environmental problems are identified. In addition, inspections may be required subsequent to receipt of an environmental complaint, or as part of the investigation work, as specified in the EAP.

The following parameters are required to be audited as part of the operation phase EM&A programme:

1. Air Quality;
2. Water Quality;
3. Waste Management; and
4. Land Contamination.

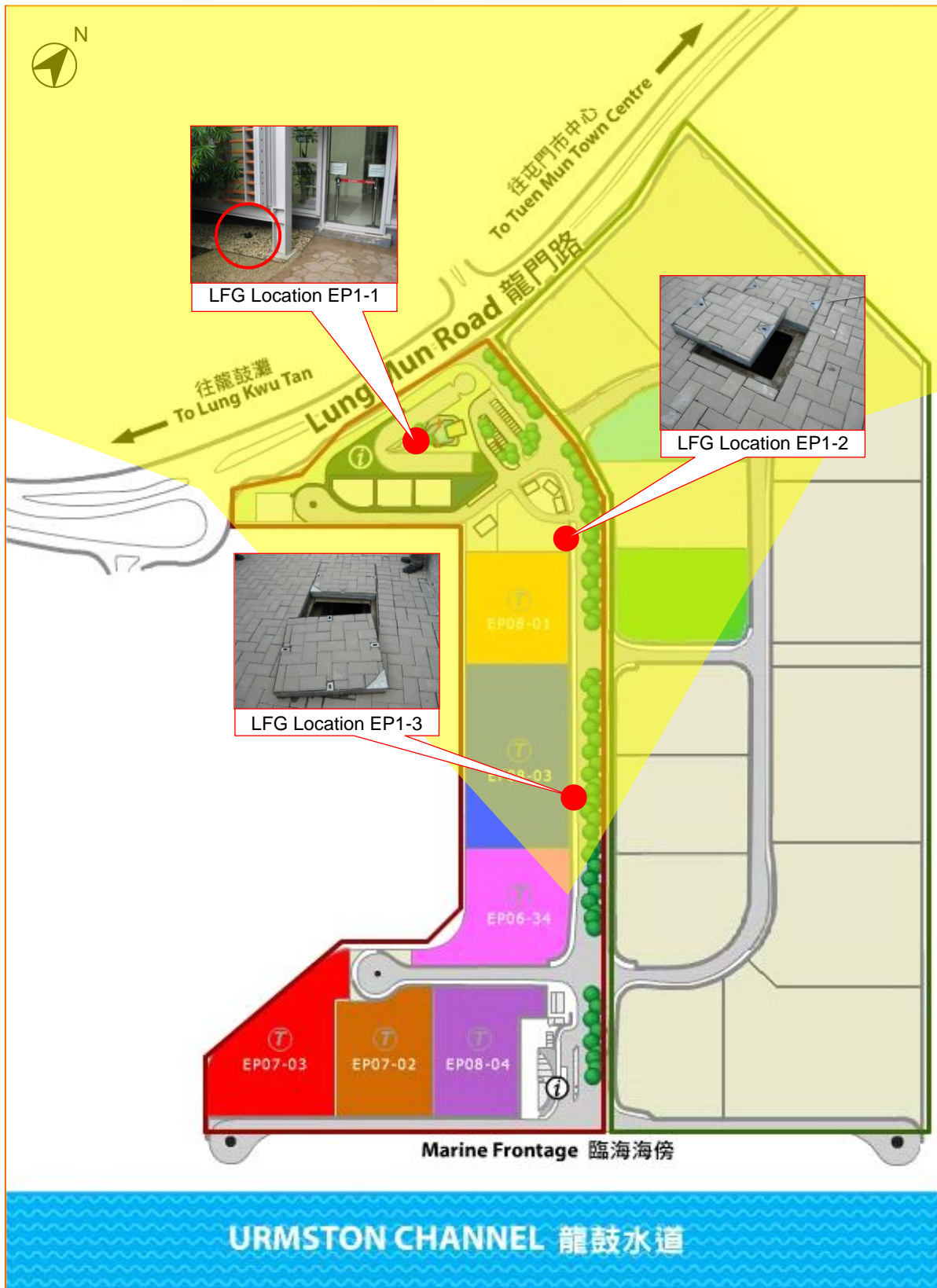
## 2.4 Environmental Mitigation Measures

Environmental mitigation measures applicable to the operation phase EM&A as stated in the Implementation Schedule are summarised in **Appendix 1**.

## 2.5 Environmental Requirements in Tenancy Agreements

Environmental requirements specified in tenancy agreements are summarised in **Appendix 2**.

Figure 2-1 LFG Monitoring Locations within EcoPark Phase 1



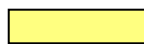
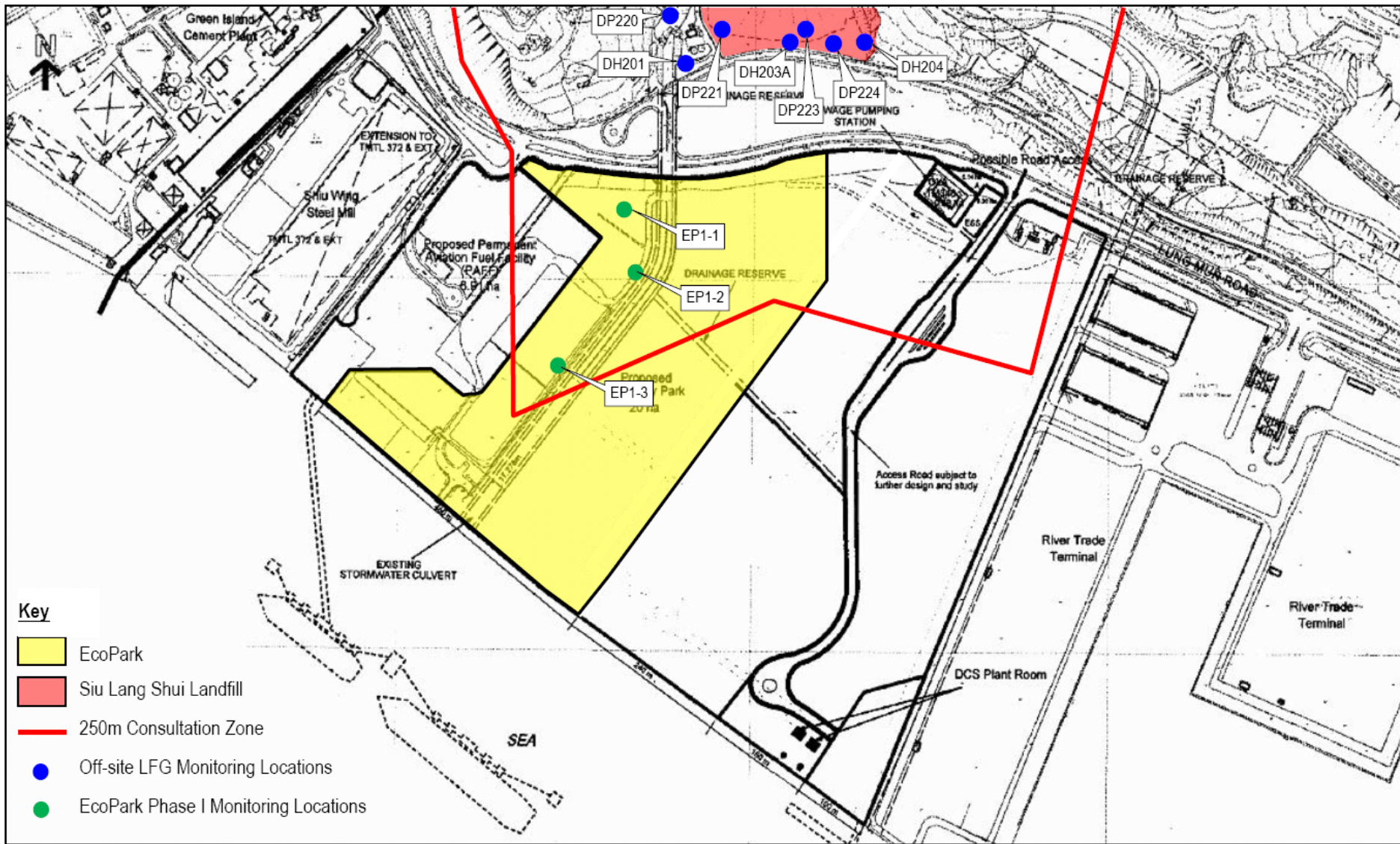
 Area Within the Siu Lang Shui Landfill Gas Consultation Zone

Figure 2-2 Replacement Figure for EM&A Manual Figure 6.1





## 3 OPERATION STATUS

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### 3.1 Tenants and Processes

The locations of lots within EcoPark, the tenancy numbers and tenant names are shown in *Figure 3-1*.

#### 3.1.1 Tenancy EP07-03

- **Lot Size:** Approx. 6,000m<sup>2</sup>
- **Activity:** Recycling of Organic Waste (Waste Cooking Oil)
- **Tenant:** Champway Technology Limited
- **Recycling Process:** Turn waste cooking oil into biodiesel by extraction, neutralisation, separation and distillation

Following a trial run in May and June 2010, Phase 1 recycling activities commenced in July 2010. In 2010, a significant amount of treated cooking oil has been processed and biodiesel produced. A summary of waste throughputs is provided in *Section 3.2*.

#### 3.1.2 Tenancy EP08-03

- **Lot Size:** Approx. 9,500 m<sup>2</sup>
- **Activity:** Recycling of Waste Metals
- **Tenant:** Shiu Wing Steel Limited
- **Recycling Process:** Turn waste metals into light ferrous scrap and heavy ferrous scrap by sorting, baling and shearing

Following a trial run in May and June 2010, recycling activities commenced in July 2010. In 2010, large amount of waste metal/steel scrap have been processed. A summary of waste throughputs is provided in *Section 3.2*.

#### 3.1.3 Tenancy EP06-034

- **Lot Size:** Approx. 5,000m<sup>2</sup>
- **Activity:** Recycling of Waste Wood
- **Tenant:** Hong Kong Hung Wai Wooden Board Company
- **Recycling Process:** Shred waste wood into wooden chips for further processing in Mainland China. Ferrous metals will be separated by magnets.

Following a trial run in May and June 2010, recycling activities commenced in July 2010. Large quantities of wood chips (product output) have been produced in 2010. A summary of waste throughputs is provided in *Section 3.2*.

### 3.1.4 Tenancy EP07-02

- **Lot Size:** Approx. 6,500m<sup>2</sup>
- **Activity:** Recycling of WEEE
- **Tenant:** Li Tong Group
- **Recycling Process:** Manually dismantling of WEEE, particularly CRT glass and LCD panels into metals (ferrous materials, aluminium, etc.) and non-metals (fibres, plastics, etc.).

Following a trial run in September 2010, Phase 1 recycling activities commenced in October 2010. A summary of waste throughputs is provided in [Section 3.2](#).

### 3.1.5 Tenancy EP08-01

- **Lot Size:** Approx. 5,000m<sup>2</sup>
- **Activity:** Recycling of Waste Plastics
- **Tenant:** Hong Kong Telford Envirotech Group Limited
- **Recycling Process:** Sorting, shredding and extrusion of waste plastics

As of end-December 2010, the tenant has commenced preparatory works but has not yet commenced formal recycling activities. Telford commenced trial commissioning on 4 November 2010. Plastic bags have been stockpiled in the lot since July 2009, and other plastic waste and some recycling equipment is also present. The Process Review Checklist (PRC) will be reviewed and revised pending receipt of further information from the tenant.

### 3.1.6 Tenancy EP08-04

- **Lot Size:** Approx. 4,000 m<sup>2</sup>
- **Activity:** Recycling of materials arising from industrial and commercial activities
- **Tenant:** Cosmos Star Holdings Co., Limited
- **Recycling Process:** Separate waste lead-acid and lithium batteries by mechanical / physical means. The battery acid will be drained and treated by the on-site wastewater treatment system

A building contractor was engaged in October 2010 and preparatory works have commenced. As of end-December 2010, building works were still in progress.

### 3.1.7 Tenancy P7

- **Lot Size:** Approx. 5,000 m<sup>2</sup>
- **Activity:** Recycling of waste plastics
- **Tenant:** Yan Oi Tong Limited
- **Recycling Process:** Convert mixed waste plastics into pellets / flakes / baled materials by pre-washing, sorting, flaking, secondary washing, drying, extrusion and chip-forming

Recycling activities commenced after trial operation in March 2010. In 2010, large amount of waste plastics have been sorted. A summary of waste throughputs is provided in [Section 3.2](#).

### 3.1.8 Tenancy P5

- **Lot Size:** Approx. 5,000 m<sup>2</sup>
- **Activity:** Recycling of WEEE
- **Tenant:** St. James' Settlement
- **Recycling Process:** WEEE will be sorted on site first. The WEEEs suitable for reuse will be repaired and refurbished, whilst those irreparable / not suitable for repair will be manually dismantled to recover the reusable parts and recyclable materials

After the completion of construction works in September 2010, recycling activities commenced in October 2010. A summary of waste throughputs is provided in **Section 3.2**.

## 3.2 Throughput Statistics

As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Two tenants, Telford and Cosmos, have not commenced full recycling activities as they are still constructing their premises, however Telford commenced trial commissioning on 4 November 2010. The following throughputs occurred in 2010:

1. **Champway.** 1,347,001kg of cooking oil and 1,146,700kg of grease-trap waste were delivered to the site, producing 2,248,350kg of treated cooking oil, 1,922,170kg of biodiesel and 83,563kg of glycerine. A total of 337,459kg of waste was generated, including 95,976kg of inorganic waste, 143,449kg of organic waste and 98,034kg of water waste (semi-solid and slurry inclusive).
2. **Shiu Wing.** 4,561,540kg of waste metal was delivered to and processed at the tenant lot, producing the same amount of sheared heavy ferrous scrap on site. No waste was generated.
3. **Hung Wai.** 4,492,330kg of waste wood was delivered to and processed at the site, resulting in 4,285,120kg of wood chips as product output. No waste was generated.
4. **Li Tong.** 85,175kg of WEEE was delivered to the site, producing 9,172kg of metals and 33,607kg of non-metals. No waste was generated.
5. **Telford.** Although formal recycling activities are not currently being carried out, 123,600kg of waste plastics were delivered. Telford commenced trial commissioning on 4 November 2010.
6. **Cosmos.** No recycling activities are being carried out and no waste has been delivered.
7. **Yan Oi Tong.** 615,178kg of waste plastics was received and 405,834kg was processed. 110,994kg of general refuse was generated from mixed waste plastics.
8. **St. James' Settlement.** 41,400kg of WEEE was delivered to the site, producing 5,880 units of repaired / refurbished EEE. 1,925kg of general refuse was generated from WEEE.

Detailed throughput figures are provided in **Appendix 3**.

Figure 3-1 Current Lot Usage Within EcoPark



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## 4 IMPLEMENTATION STATUS OF ENVIRONMENTAL PROTECTION MEASURES

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Environmental mitigation measures applicable to the operation phase EM&A as stated in the implementation schedule are summarised in *Appendix 1*. Environmental requirements specified in tenancy agreements are summarised in *Appendix 2*.

As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Appropriate environmental protection measures are in place.

## 5 MONITORING RESULTS

### 5.1 Monitoring Date, Time, Frequency and Duration

LFG measurement was conducted on quarterly basis. Measurements were undertaken during the joint IEC site inspections on 25 January, 28 April, 26 July and 27 October 2010. Monitoring details are shown in **Table 5-1**.

**Table 5-1 Sampling Schedule of LFG Monitoring**

Station ID	Date	Time	Duration	Air Temperature	Weather
EP1-1	25 January 2010	10:20 – 10:25	5 minutes	17°C	Hazy
EP1-2		10:30 – 10:35			
EP1-3		10:40 – 10:45			
EP1-1	28 April 2010	10:17 – 10:22	5 minutes	21°C	Fine
EP1-2		10:26 – 10:31			
EP1-3		10:34 – 10:39			
EP1-1	26 July 2010	10:41 – 10:46	5 minutes	30°C	Fine
EP1-2		10:28 – 10:33			
EP1-3		10:12 – 10:17			
EP1-1	27 October 2010	09:40 – 09:45	5 minutes	21°C	Fine
EP1-2		09:50 – 09:55			
EP1-3		10:05 – 10:10			

### 5.2 Monitoring Methodology, Parameters and Equipment

The LFG monitoring requirement and methodology are stipulated in Section 6 of the EM&A Manual. The LFG monitoring parameters and their measurement ranges are detailed in **Table 5-2**.

**Table 5-2 Parameters and Measurement Ranges of LFG Monitoring**

Parameters	Measurement Ranges
Methane (CH <sub>4</sub> )	0-100% LEL & 0-100% v/v
Oxygen (O <sub>2</sub> )	0-25% v/v
Carbon Dioxide (CO <sub>2</sub> )	0-100% v/v
Barometric Pressure	mBar (absolute)

LFG monitoring shall be carried out using intrinsically-safe, portable multi-gas monitoring instruments. The gas monitoring equipment shall:

1. Where possible, comply with BS 6020 and be approved by BASEEFA as intrinsically safe, suitable for use in a Zone 2 are to BS 5345.
2. Be capable of continuous monitoring of methane, oxygen and carbon dioxide.
3. Be capable of continuous barometric pressure and gas pressure measurements.
4. Normally operate in diffusion mode unless required for spot sampling, when it should be capable of operating by means of an aspirator or pump.
5. Have low battery, fault and over range indication incorporated.
6. Store monitoring data, and shall be capable of being down-loaded directly to a PC.

7. Measure in the following ranges:
- Methane 0-100% LEL & 0-100% v/v
  - Oxygen 0-25% v/v
  - Carbon dioxide 0-100% v/v
  - Barometric pressure mBar (absolute)

The monitoring equipment shall alarm (both audibly and visually) in the event that the concentrations of the following are exceeded:

1. Methane – rise to 10% LEL.
2. Oxygen – fall to 18% by volume.
3. Carbon monoxide – maximum short term (1-hour) exposure of 300ppm with long term average (8-hours) not to exceed 50ppm.

### 5.3 Types of Equipment Used and Calibration Details

One Infra Red Gas Analyser Model GA94A (serial number GA3385) was used for LFG measurements. The gas analyser is calibrated every 18 months. [Appendix 4](#) presents the calibration records of the monitoring equipment.

### 5.4 Results and Graphical Plots of Monitoring Parameters

LFG monitoring results are summarised in [Table 5-3](#) and compared with the Action and Limit Levels tabulated in [Table 2-2](#). Graphical plots of the monitoring results are also provided in [Appendix 5](#).

**Table 5-3 LFG Monitoring Results**

Station ID	Date	Monitoring Results				
		CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% LEL)	O <sub>2</sub> (% v/v)	CO <sub>2</sub> (% v/v)	Barometric Pressure (mBar)
EP1-1	25 January 2010	0.0	0	21	0.4	1023
EP1-2		0.0	0	21	0.0	1023
EP1-3		0.0	0	21	0.0	1023
EP1-1	28 April 2010	0.0	0	21	0.0	1013
EP1-2		0.0	0	21	0.0	1013
EP1-3		0.0	0	21	0.0	1013
EP1-1	26 July 2010	0.0	0	19	0.2	1004
EP1-2		0.0	0	20	0.0	1005
EP1-3		0.2	4	21	0.0	1004
EP1-1	27 October 2010	0.0	0	21	0.0	1018
EP1-2		0.0	0	21	0.0	1018
EP1-3		0.0	0	20	0.0	1019

As can be seen from the above, no Action or Limit Level exceedances were recorded.

## 6 WASTE GENERATION STATISTICS

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As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. The details of waste generation are shown in **Appendix 3**.

1. **Champway.** A total of 337,459kg of waste, including 95,976kg of inorganic waste, 143,449kg of organic waste and 98,034kg of water waste (semi-solid and slurry inclusive). These organic waste and water waste were collected by licence collectors, transported to and disposed of at WENT Landfill as general refuse.
2. **Shiu Wing.** Has not generated any non-ferrous scrap / general refuse from the waste metal / steel scrap in 2010.
3. **Hung Wai.** Has not produced any general refuse from the waste wood in this reporting period.
4. **Li Tong.** Has not produced any general refuse from the WEEE in this reporting period.
5. **Yan Oi Tong.** 110,994kg of general refuse was sorted from the mixed waste plastics at Yan Oi Tong's lot, and subsequently disposed of at WENT Landfill.
6. **St. James' Settlement.** 1,925kg of general refuse was sorted from the WEEE at St James' lot, and subsequently disposed of at WENT Landfill.



## 7 SUMMARY OF ENVIRONMENTAL AUDIT

### 7.1 January 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET and the IEC in a joint inspection on 25 January 2010.

#### 7.1.1 Tenant Audits

No tenant had commenced recycling activities; however, Champway had started preparatory works and a summary of its audit is provided below. The audit was conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observation of oil stain near the grease trap was rectified, whilst the observation about oil stain and uncovered waste cooking oil bucket at the reserved area for WWTP remained outstanding. One new observation on movable air compressor of more than 500kPa and handheld breaker of more than 10kg without noise emission labels (NELs) was recorded during the audit. The tenant was reminded to either apply for the NELs from EPD or stop using those equipments.

#### 7.1.2 General EcoPark Audit

Following the site audit in December 2009, the observation on muddy water at Li Tong's lot was rectified, whereas the observation on muddy runoff outside Yan Oi Tong's lot remained outstanding.

Four new environmental observations on stockpiling of construction materials, chemicals on bare ground and large stockpile of soil were found at Shiu Wing's and Li Tong's lot. The tenants were therefore reminded to enhance housekeeping, provide drip tray to all chemicals and cover the stockpile with canvas. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

During the joint site inspection, LFG monitoring was undertaken at the three monitoring locations agreed by the ET, IEC and SGJV at the three monitoring locations (*Table 2-1* and *Figure 2-1 refer*). The monitoring results are presented in *Section 5.4*. No action / limit level exceedances were recorded.

### 7.2 February 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 23 February 2010.

#### 7.2.1 Tenant Audits

No tenant had commenced recycling activities; however, Champway had started preparatory works and a summary of its audit is provided below. The audit was conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Movable air compressor and handheld breaker that required NELs observed in the previous audit were no longer found, whilst the observation about oil stain and uncovered waste cooking oil bucket at the reserved area for

wastewater treatment plant (WWTP) remained outstanding. One new observation on oily patch near drains was recorded during the audit. The tenant was reminded to clear the patch and prevent washing it into the drains.

### 7.2.2 General EcoPark Audit

Following the site audit in January 2010, the observations on piles of construction materials at Shiu Wing's lot, chemicals without drip tray at Li Tong's lot and muddy trail outside Yan Oi Tong's lot were rectified, whereas the observations on piles of soil and construction materials at Li Tong's lot remained outstanding.

Three new environmental observations on stockpiling of soil at Hung Wai's lot, chemical spillage on the ground of Li Tong's lot and muddy trail outside tenant lot P9 were found. The tenants were therefore reminded to cover the stockpile with canvas, provide drip tray to all chemicals and clear the muddy trail correspondingly. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.3 March 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 22 March 2010.

### 7.3.1 Tenant Audits

No tenant had commenced recycling activities; however, Champway and Yan Oi Tong had started preparatory works and a summary of their audits is provided below. The audit of Champway was conducted based on the approved site inspection checklist, whereas the audit of Yan Oi Tong was carried out using the general EcoPark audit checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observation on oily patch near drains was rectified, whilst the observation on oil stain and uncovered waste cooking oil bucket at the reserved area for WWTP remained outstanding. No new observations were recorded during the audit.
2. **Yan Oi Tong.** No new observations were recorded during the audit.

### 7.3.2 General EcoPark Audit

Following the site audit in February 2010, the observations of stockpiling of soil at Hung Wai's lot, chemical spillage on the ground of Li Tong's lot and muddy trail outside tenant lot P9 were rectified, whereas the observations on piles of soil and construction materials at Li Tong's lot remained outstanding.

No new environmental observations were found during the audit. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.4 April 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET and the IEC in a joint inspection on 28 April 2010.

### 7.4.1 Tenant Audits

No tenant had commenced recycling activities; however, Champway and Yan Oi Tong had started preparatory works and a summary of their audits is provided below. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observation on oil stain and uncovered waste cooking oil bucket at the reserved area for WWTP remained outstanding. No new observation was recorded during the audit.
2. **Yan Oi Tong.** No follow-up action was required from the previous site audit, and no new observations were recorded during the audit.

### 7.4.2 General EcoPark Audit

Following the site audit in March 2010, the observations on piles of soil and construction materials at Li Tong's lot remained outstanding.

Three new environmental observations on oil stain at Shiu Wing's lot, stockpile of soil at Telford's lot and discharge of muddy water into drains outside tenant lot P9 were found during the audit. The tenants were therefore reminded to provide drip tray to chemicals, cover the stockpile with canvas and provide proper treatment to muddy water correspondingly. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

During the joint site inspection, LFG monitoring was undertaken at the three monitoring locations agreed by the ET, IEC and SGJV at the three monitoring locations (*Table 2-1* and *Figure 2-1 refer*). The monitoring results are presented in *Section 5.4*. No action / limit level exceedances were recorded.

## 7.5 May 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 25 May 2010.

### 7.5.1 Tenant Audits

One tenant (Yan Oi Tong) had commenced recycling activities, whilst Champway had started preparatory works. A summary of their audits is provided below. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observation on oil stain and uncovered waste cooking oil bucket at the reserved area for WWTP remained outstanding. One new observation on stagnant water with oil floating on top at the reserved area for WWTP was recorded during the audit. The tenant was reminded to remove the stagnant water as soon as possible.
2. **Yan Oi Tong.** No follow-up action was required from the previous site audit. One new observation on stagnant pool of wastewater was recorded during the audit. The tenant was reminded to divert all wastewater to the treatment facility.

## 7.5.2 General EcoPark Audit

Following the site audit in April 2010, the observations on stockpiles of soil at Li Tong's lot, oil stain at Shiu Wing's lot and discharge of muddy water into drains outside tenant lot P9 were rectified, whereas the observations on stockpiles of construction materials at Li Tong's lot and stockpile of soil at Telford's lot remained outstanding.

One new environmental observation on dusty operation at Hung Wai's lot was found during the audit. The tenant was therefore reminded to provide enclosures around the dust-generating activities. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.6 June 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 21 June 2010.

### 7.6.1 Tenant Audits

Two tenants (Shiu Wing and Yan Oi Tong) had commenced recycling activities, whilst Champway had started preparatory works. A summary of their audits is provided below. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observations on oil stain, uncovered waste cooking oil bucket and stagnant water at the reserved area for WWTP remained outstanding. One new observation on oil stain near storage tanks was recorded during the audit. The tenant was reminded to remove the oil stain by sand and dispose of the sand properly.
2. **Shiu Wing.** No new observations were recorded during the audit.
3. **Yan Oi Tong.** Previous observation on stagnant pool of wastewater was rectified. One new observation on turbid water inside drains was recorded during the audit. The tenant was reminded to divert all wastewater to the treatment facility.

### 7.6.2 General EcoPark Audit

Following the site audit in May 2010, the observations on stockpiles of construction materials at Li Tong's lot, stockpile of soil at Telford's lot and dusty operation at Hung Wai's lot remained outstanding.

Two new environmental observations on oil stain near machines and water dripping from air-conditioners were found at Hung Wai's lot during the audit. The tenant was therefore reminded to remove the stain and place buckets under the air-conditioners. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.7 July 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET and the IEC in a joint inspection on 26 July 2010.

### 7.7.1 Tenant Audits

Four tenants (Champway, Shiu Wing, Hung Wai and Yan Oi Tong) had commenced recycling activities and a summary of their audits is provided below. Apart from Hung Wai (see below), the audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observations on oil stain, uncovered waste cooking oil bucket and stagnant water at the reserved area for WWTP remained outstanding. Two new observations on placing chemicals on bare ground and stagnant water on equipments were recorded during the audit. The tenant was reminded to put chemicals at a proper storage area and remove the stagnant water as soon as possible.
2. **Shiu Wing.** No follow-up action was required from the previous site audit. Two new observations on oil stain and uncovered oil drums were recorded during the audit. The tenant was reminded to remove the stain and store the oil drums with full cover.
3. **Hung Wai.** Since the tenant representative was not available, the audit was conducted based on the general EcoPark audit checklist instead of the approved tenant-specific audit checklist. Previous observation of oil stains near machines was rectified, whereas the observations on dusty operation and water dripping from air-conditioners remained outstanding. Four new observations on chemicals on ground, stagnant water underneath machines, blocked drain and accumulation of sawdust were recorded during the audit. The tenant was reminded to provide drip tray to chemicals, clear the stagnant water as soon as possible, provide regular maintenance to the drainage system and remove the sawdust more frequently.
4. **Yan Oi Tong.** Previous observation on turbid water inside drains was rectified. One new observation on refuse around the lot and inside the stormwater drains was recorded during the audit. The tenant was reminded to enhance housekeeping and prevent refuse from entering the drains.

### 7.7.2 General EcoPark Audit

Following the site audit in June 2010, the observations on piles of construction materials at Li Tong's lot and stockpile of soil at Telford's lot remained outstanding.

Three new environmental observations on muddy trail outside tenant lot P10, chemicals on bare ground and plastics lying around Telford's lot were found during the audit. The tenants were therefore reminded to clear the trail, provide drip tray to chemicals and enhance housekeeping respectively. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

During the joint site inspection, LFG monitoring was undertaken at the three monitoring locations agreed by the ET, IEC and SGJV at the three monitoring locations (*Table 2-1* and *Figure 2-1 refer*). The monitoring results are presented in *Section 5.4*. No action / limit level exceedances were recorded.

## 7.8 August 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 30 August 2010.

### 7.8.1 Tenant Audits

Four tenants (Champway, Shiu Wing, Hung Wai and Yan Oi Tong) had commenced recycling activities and a summary of their audits is provided below. Apart from Hung Wai (see below), the audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observations of oil stain, uncovered waste cooking oil bucket and stagnant water at the reserved area for WWTP were rectified. Two new observations of chemical drum and oil dripping on bare ground were recorded during the audit. The tenant was reminded to store and label the chemicals properly, as well as providing appropriate secondary containment for this potential source of ground contamination.
2. **Shiu Wing.** Previous observations of oil spillage and uncovered oil drums were rectified. Two new observations of chemical waste handling and suspected Asbestos Containing Materials (ACM) were recorded during the audit. The tenant was advised to register as a Chemical Waste Producer and engage a registered asbestos laboratory for testing the suspected ACM.
3. **Hung Wai.** Since the tenant representative was again not available, the audit was conducted based on the general EcoPark audit checklist instead of the approved tenant-specific audit checklist. Previous observations of environmental deficiency were rectified, and no new observations were recorded during the audit.
4. **Yan Oi Tong.** Previous observations of environmental deficiency were rectified. One new observation of refuse on bare ground of the waste storage area was recorded during the audit. The tenant was reminded to enhance housekeeping.

### 7.8.2 General EcoPark Audit

Whilst the previous observations at Telford's and Li Tong's lot were rectified, the general EcoPark audit found muddy trails outside lot P10 (from the Phase 2 works contractor) were still in evidence. The Operator was advised to liaise with the Resident Engineer to ensure that the mud was cleared. No new observations were recorded during the audit. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.9 September 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 29 September 2010.

### 7.9.1 Tenant Audits

Four tenants (Champway, Shiu Wing, Hung Wai and Yan Oi Tong) had commenced recycling activities and a summary of their audits is provided below. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observations of environmental deficiencies were rectified. No new observations were recorded during the audit.
2. **Shiu Wing.** Previous observations on chemical waste handling and suspected ACM shall be followed up in the next monthly audit. No new observations were recorded during the audit.

3. **Hung Wai.** No follow-up action was required from the previous site audit, and no new observations were recorded during the audit.
4. **Yan Oi Tong.** Previous observations of environmental deficiency remained outstanding. Two new observations of overflow at the working area and stagnant water inside the manhole of the storm water drain were recorded during the audit. The tenant was reminded to provide proper maintenance to their WWTP and to clean the surface channels.

### 7.9.2 General EcoPark Audit

The general EcoPark audit found muddy trails outside lot P10 (from the Phase 2 works contractor) were still in evidence, although less so than in the previous audit. The Operator was again advised to remind the Phase 2 works contractor to clear the mud. No new observations were recorded during the audit. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.10 October 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET and the IEC in a joint inspection on 27 October 2010.

### 7.10.1 Tenant Audits

Six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) had commenced recycling activities and a summary of their audits is provided below. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** No follow-up action was required from the previous site audit. Two new observations of chemical drums and oil stains on bare ground were recorded during the audit. The tenant was reminded to place chemicals in a proper storage area and dispose of the oil stains properly.
2. **Shiu Wing.** Previous observations on chemical waste handling and suspected ACM shall be followed up in the next monthly audit. No new observations were recorded during the audit.
3. **Hung Wai.** No follow-up action was required from the previous site audit. One new observation of fugitive dust from packaging of shredded wood chips was recorded during the audit. The tenant was advised to minimise the gap between the outlet and packaging bags to control fugitive dust emission.
4. **Li Tong.** No new observations were recorded during the audit.
5. **Yan Oi Tong.** Previous observations of environmental deficiency remained outstanding and the tenant was again reminded to improve housekeeping, install a screen at the drain inlet and provide covers for the surface channels. No new observations were recorded during the audit.
6. **St. James' Settlement.** No new observations were recorded during the audit.

### 7.10.2 General EcoPark Audit

Following the site audit in September 2010, no follow-up action was required as the previous muddy trails had been cleaned. One new environmental observation of an oily

patch at Telford's lot was recorded during the audit. The tenant was therefore reminded to clear the patch as soon as possible and provide secondary containment during equipment oil replacement / underneath oil drums. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

During the joint site inspection, LFG monitoring was undertaken at the three monitoring locations agreed by the ET, IEC and SGJV at the three monitoring locations (*Table 2-1* and *Figure 2-1 refer*). The monitoring results are presented in *Section 5.4*. No action / limit level exceedances were recorded.

## 7.11 November 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 23 November 2010.

### 7.11.1 Tenant Audits

Six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) had commenced recycling activities and a summary of their audits is provided below. Telford commenced trial commissioning on 4 November 2010. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observations of environmental deficiency were rectified. One new observation of stagnant water was recorded during the audit. The tenant was reminded to clear the water as soon as possible.
2. **Shiu Wing.** Previous observation on chemical waste handling was rectified, whereas the observation on collecting and disposing ACM shall be followed up in the next monthly audit. One new observation on wastewater generation and discharge was recorded during the audit. The tenant was reminded to provide appropriate treatment to the wastewater and apply for the wastewater discharge licence.
3. **Hung Wai.** Previous observation on fugitive dust generation was rectified. No new observations were recorded during the audit.
4. **Li Tong.** No follow-up action was required from the previous site audit. No new observations were recorded during the audit.
5. **Yan Oi Tong.** Previous observations of environmental deficiency remained outstanding and the tenant was again reminded to improve housekeeping, install a screen at the drain inlet and provide covers for the surface channels. No new observations were recorded during the audit.
6. **St. James' Settlement.** No follow-up action was required from the previous site audit. Two new observations on the handling of unwanted refrigerant and potential LFG hazard were recorded during the audit. The tenant was suggested to follow the equipment manufacturer's instruction while operating the equipment and adopt several LFG precautionary and protection measures on site.

### 7.11.2 General EcoPark Audit

Following the site audit in October 2010, the observation on oily patch at Telford's lot was rectified. One new environmental observation on diesel odour emission at Telford's lot was recorded during the audit. The tenant was therefore reminded to cap all oil



containers. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

## 7.12 December 2010

Environmental audits of active tenants and the general EcoPark audit were carried out by the ET on 21 December 2010.

### 7.12.1 Tenant Audits

Six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) had commenced recycling activities and a summary of their audits is provided below. Telford commenced trial commissioning on 4 November 2010. The audits were conducted based on the approved site inspection checklist. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

1. **Champway.** Previous observation on stagnant water was rectified. No new observations were recorded during the audit.
2. **Shiu Wing.** Previous observation on wastewater generation and discharge was rectified, whereas the observation on collecting and disposing ACM shall be followed up in the next monthly audit. No new observations were recorded during the audit.
3. **Hung Wai.** No follow-up action was required from the previous site audit. No new observations were recorded during the audit.
4. **Li Tong.** No follow-up action was required from the previous site audit. No new observations were recorded during the audit.
5. **Yan Oi Tong.** Previous observations on waste plastics inside gully and soil inside surface channels were rectified, whilst the observations on refuse on bare ground and wastewater overflow remained outstanding. The tenant was again reminded to improve housekeeping and clear the wastewater regularly. No new observations were recorded during the audit.
6. **St. James' Settlement.** Previous observations on the handling of unwanted refrigerant and potential LFG hazard were rectified. No new observations were recorded during the audit.

### 7.12.2 General EcoPark Audit

Following the site audit in November 2010, the observation on diesel odour emission at Telford's lot was rectified. No new environmental observations were recorded during the audit. Please refer to the Quarterly EM&A Compliance Reports for the completed audit checklists of EcoPark.

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## 8 COMPLAINTS

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As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Telford commenced trial commissioning on 4 November 2010. No complaints related to recycling activities have been received in this reporting period.

## 9 ANNUAL REVIEW

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### 9.1 Interpretation of EM&A Data

As mentioned in **Section 2.1**, the only parameter to be monitored as part of the operation phase EM&A programme is LFG. Quarterly LFG monitoring has been carried out by the ET since October 2009 following the completion of Phase 1 construction of EcoPark, as stipulated in Clauses 6.4.3 and 6.4.4 of the Final EM&A Manual.

LFG monitoring was conducted on 25 January, 28 April, 26 July and 27 October 2010, and no action / limit level exceedances were recorded in the reporting period (**Section 5.4** refers). Consequently, the outcome of quarterly monitoring is considered as sufficient and effective according to Section 8.7.11 of the EIA Report and Section 6.4.4 of the EM&A Manual.

### 9.2 Environmental Acceptability of EcoPark

As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Referring to **Section 1.2** and **Chapter 7**, no critical environmental deficiencies were identified at various tenant lots in EcoPark in 2010. The operation of EcoPark in environmental terms is therefore of an acceptable level.

### 9.3 Monitoring Methodology

As mentioned in **Section 9.1**, quarterly LFG monitoring has been carried out by the ET since October 2009, and no Action/Limit Level exceedances were recorded in 2010. The quarterly monitoring of LFG adopted is therefore considered as sufficient and effective according to Section 8.7.11 of the EIA Report and Section 6.4.4 of the EM&A Manual.

### 9.4 Practicality and Effectiveness of EIA Process and EM&A Programme

As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots.

The EM&A programme has been fully utilised throughout 2010, which was practical and effective to monitor the operation status of tenants. The mitigation measures proposed in the EIA Study are effective and efficient. No improvements to the EM&A programme are recommended.

## 10 CONCLUSIONS

This is the fourth annual EM&A report prepared for the operation phase of EcoPark and covers January to December 2010.

At present, there are eight tenants in EcoPark. As of end-December 2010, six tenants (Champway, Shiu Wing, Hung Wai, Li Tong, Yan Oi Tong and St. James' Settlement) have commenced recycling activities within their lots. Two tenants (Telford and Cosmos) have not commenced recycling activities as they are still carrying out preparatory works within their lots. The following throughputs occurred during the year:

1. **Champway.** 1,347,001kg of cooking oil and 1,146,700kg of grease-trap waste were delivered to the site, producing 2,248,350kg of treated cooking oil, 1,922,170kg of biodiesel and 83,563kg of glycerine. A total of 337,459kg of waste was generated, including 95,976kg of inorganic waste, 143,449kg of organic waste and 98,034kg of water waste (semi-solid and slurry inclusive).
2. **Shiu Wing.** 4,561,540kg of waste metal was delivered to and processed at the tenant lot, producing the same amount of sheared heavy ferrous scrap on site. No waste was generated.
3. **Hung Wai.** 4,492,330kg of waste wood was delivered to and processed at the site, resulting in 4,285,120kg of wood chips as product output. No waste was generated.
4. **Li Tong.** 85,175kg of WEEE was delivered to the site, producing 9,172kg of metals and 33,607kg of non-metals. No waste was generated.
5. **Telford.** Although formal recycling activities are not currently being carried out, 123,600kg of waste plastics were delivered.
6. **Cosmos.** No recycling activities are being carried out and no waste has been delivered.
7. **Yan Oi Tong.** 615,178kg of waste plastics was received and 405,834kg was processed. 110,994kg of general refuse was generated from mixed waste plastics.
8. **St. James' Settlement.** 41,400kg of WEEE was delivered to the site, producing 5,880 units of repaired / refurbished EEE and 1,925kg of general refuse.

In terms of monitoring during operation phase EM&A, only quarterly monitoring of LFG is required "following construction". Construction of Phase 1 was completed in August 2009, so LFG monitoring commenced in the next reporting quarter (August to October 2009). LFG monitoring during 2010 was undertaken on 25 January, 28 April, 26 July and 27 October. No Action/Limit Level exceedances were recorded.

Construction of Phase 2 was completed in November 2010. Construction phase LFG monitoring for Phase 2 was carried out by the works contractor during this period. Operation phase LFG monitoring will commence in the next reporting quarter (November 2010 to January 2011).

The ET has conducted monthly site inspections based on the approved checklist. Since October 2009, the checklist has been used in the monthly site inspections for various tenants. Environmental deficiencies and general observations noted during the monthly site inspections were detailed in **Section 7**. Remedial actions were recommended to tenants, and the remedial status shall be followed up in the next monthly site inspection.

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## APPENDIX 1

### Environmental Mitigation Measures (from the Implementation Schedule)

EIA Ref.	EM&A Ref.	Environmental Protection Measures Identified in the Implementation Schedule that are Applicable to the Operation Phase of EcoPark	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Relevant Legislation and Guidelines
<b>General</b>					
5.5.23 to 5.5.25, 10.2.24 & 10.2.37	4.2.5 to 4.2.8	The Operator shall develop and implement an Emergency Response Plan (ERP) that lists the procedures to be followed in case of fire, fuel or chemical spillage or other emergency within the EcoPark.	Throughout the duration of the operation.	Operator	
12.2	7.2	No process shall be allowed to operate within EcoPark without approval from WFBU. Approval will be based on the ten-step Process Review, which may include a Design Audit if deemed to be necessary.	Throughout the duration of the operation.	ET IEC Project Proponent	
	8.1.2	All reports (including Process Review Checklists and any Design Audits) shall be prepared and certified by the ET, verified by the IEC and approved by the Project Proponent.	Throughout the duration of construction works until construction is substantially completed. Throughout the duration of the operation.	ET IEC Project Proponent	
12.3	7.3	The Operator shall prepare and implement an Environmental Management Plan (EMP) to define mechanisms for achieving the environmental requirements specified in the EIA, EP and in statutory regulations.	Throughout the duration of the operation.	Operator	
<b>Air Quality</b>					
13.2		The Operator shall ensure that the EcoPark “base case” assumptions for air quality shown in Table 13.1 of the Final EIA Report are met by tenants, as a whole.	Throughout the duration of the operation.	Operator	Table 13.1 of the Final EIA Report
<b>Water Quality</b>					
5.4.11 & 5.6.7		To minimise the chance of accidental spillage during loading and unloading, and thereby reduce marine water quality impacts, well established cargo handling guidelines should be followed.	Adjacent to EcoPark marine frontage when loading or unloading goods.	Operator Operators of bulk carriers	Sections 5 & 6 of IMO Code of Practice for the Safe Loading/Unloading of Bulk Carriers
5.5.19		Contaminated water collected in the surface drainage systems shall be treated at the WTF or other appropriate treatment facility.	Within EcoPark throughout the life of the facility.	Operator	
5.5.23 to 5.5.25	4.2.5 to 4.2.7	An Emergency Response Plan (ERP) will be formulated to address various accident scenarios. The ERP will be certified by the Environmental Team (ET) and verified by the Independent Environmental Checker (IEC) under the operation EM&A programme.	Within EcoPark throughout the life of the facility.	Operator	
5.6.4		For uncovered areas where recovery process identified as causing potentially high level of contamination are located, stop-logs will be installed in the perimeter drainage system to isolate contamination.	Within EcoPark throughout the life of the facility.	Operator	

EIA Ref.	EM&A Ref.	Environmental Protection Measures Identified in the Implementation Schedule that are Applicable to the Operation Phase of EcoPark	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Relevant Legislation and Guidelines
	4.2.2	The ET should develop an audit checklist, with the agreement of the IEC, to ensure that each mitigation measure is implemented when appropriate and operated correctly when implemented.	Within EcoPark throughout the life of the facility.	ET with IEC	
<b>Waste Management</b>					
6.8.7	5.2.4	The Operator should register with EPD as a chemical waste producer.	Within EcoPark throughout the life of the facility.	Operator	Waste Disposal (Chemical Waste) (General) Regulation
6.8.16		The dust collected by any air pollution control equipment installed by tenants must be tested to ensure compliance for landfill disposal.	Within EcoPark throughout the life of the facility.	Operator	Practice Note for disposal of dusty waste at landfills & Admission Ticket System
6.8.18 & 6.8.22	5.2.4	Sludge will be disposed of at WENT landfill, or at any future dedicated sludge treatment facility. Sludge will be collected by a Licensed collector at regular intervals, as determined by the operation of the WTF	Within EcoPark throughout the life of the facility.	Operator	
6.8.21	5.2.4	Chemical wastes shall be stored in appropriate containers in a covered area. "No Smoking" signs will be clearly displayed to prevent accidental ignition of flammable materials. Drip trays capable of storing 110% of the volume of the largest container will be used to mitigate possible leakage.	Within EcoPark throughout the life of the facility.	Operator	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes
	5.2.3 & 5.2.5	The ET should develop an audit checklist, with the agreement of the IEC, to ensure that each mitigation measure is implemented when appropriate and operated correctly when implemented.	Within EcoPark throughout the life of the facility.	ET with IEC	
<b>Prevention of Contaminated Land</b>					
7.3.1	5.3.2	Any spillages of contaminating material shall be cleaned up immediately through the use of an absorbent. Any such used material should then be considered chemical waste and disposed of appropriately.	Within EcoPark throughout the life of the facility.	Operator	
7.3.3		Any areas within the lot to be used for recycling processes shall be concrete paved before recycling activities commence.	Within EcoPark throughout the life of the facility.	Operator	
7.3.5	5.3.2	During operation, the greatest risk of land contamination will come from storage of chemical wastes, therefore the measures should be followed :	Within EcoPark throughout the life of the facility.	Operator	
		<ul style="list-style-type: none"> <li>All chemical storage areas shall be provided with locks and be sited on sealed areas. The storage areas shall be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil and chemicals from contaminating the ground.</li> </ul>			
		<ul style="list-style-type: none"> <li>Management of chemical waste is implemented through the control of waste storage, labelling of waste, transportation and treatment of chemical waste at an appropriate facility.</li> </ul>			

EIA Ref.	EM&A Ref.	Environmental Protection Measures Identified in the Implementation Schedule that are Applicable to the Operation Phase of EcoPark	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Relevant Legislation and Guidelines
		<ul style="list-style-type: none"> <li>Chemical wastes will be collected, stored and disposed of in accordance with the Regulation. Disposal of other construction waste will be undertaken by Licensed contractors in accordance with applicable statutory requirements in the WDO.</li> </ul>			Waste Disposal (Chemical Waste) (General) Regulation
		<ul style="list-style-type: none"> <li>Chemical wastes shall be handled according to the relevant code of practice. Spent chemicals shall be stored and collected by an approved operator for disposal at a licensed facility in accordance with the relevant regulation.</li> </ul>			Code of Practice on the Packaging, Labelling and Storage of Chem Wastes & Chemical Waste (General) Regulation
	5.3.3	The ET should develop an audit checklist, with the agreement of the IEC, to ensure that each mitigation measure is implemented when appropriate and operated correctly when implemented.	Within EcoPark throughout the life of the facility.	ET with IEC	
<b>Landfill Gas</b>					
8.7.10 & 8.7.11	6.1.2	<ul style="list-style-type: none"> <li>Alert workers and visitors of possible LFG hazards</li> <li>Prohibit smoking and open fires on site</li> <li>Conduct regular (quarterly) LFG monitoring at mobile offices, equipment stores, etc.</li> </ul>	Within EcoPark throughout the life of the facility.	Operator	
	6.4.3	Following construction, routine monthly monitoring may be required at service voids and utility boxes. The monitoring requirement and specific locations of monitoring points shall be established based on the findings of the monitoring carried out during construction (i.e. if no LFG is detected during construction then no routine monitoring is required). The need for continued monitoring shall, however, be reviewed through discussion with EPD.	Within EcoPark throughout the life of the facility.	Operator	
<b>Hazard to Life</b>					
10.4.3		Building height limit within EcoPark shall be applied to structures within which people may work at elevated levels.	Within EcoPark throughout the life of the facility.	Operator	EIA Report Table 10.2
<b>Landscape and Visual</b>					
9.4.4		It recommended that this commonality be promoted throughout EcoPark by the Operator and adopted by tenants, if practicable.	Within EcoPark throughout the life of the facility.	Operator	



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## APPENDIX 2

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### Environmental Requirements in Tenancy Agreement

## GENERAL ENVIRONMENTAL RESPONSIBILITIES

- 9.1 The Tenant shall at its own cost(s) comply with and shall ensure that the Premises is used, designed, constructed, operated and maintained in accordance with:-
- (a) All relevant Ordinances, by-laws, regulations, statutory technical memorandums, codes of practice, rules, non-statutory guidance notes, schemes and abatement notices for the time being in force in Hong Kong including those relating to the environment and governing the control of any form of pollution (see specific Ordinances mentioned hereinbelow) and licensing requirements under relevant Ordinances and regulations.
  - (b) All information, mitigation measures, prohibitions, restrictions, recommendations and requirements under the Environmental Impact Assessment Report for Development of an EcoPark in Tuen Mun Area 38 with Appendices, i.e. the EIA Report (Register No.: AEIAR-086/2005) dated April 2005, the Final EM&A Manual dated April 2005, the application documents including all attachments (Application No. AEP-226/2005) and other relevant documents in the Register (or in any other places, any internet websites or by any other means as specified by the Director), including the prohibitions and mitigation measures for processes in Table 14.1 and the material throughputs, processes and remarks in Table B.1 of the EIA Report (in so far as applicable).
  - (c) All information, conditions, submissions, mitigation measures, orders, notices, requirements, prohibitions, restrictions and time limits under the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including updated information about the Permit, any amended permit and any further permit) and all mitigation measures recommended and to be recommended in submissions that shall be deposited with or approved by the Director as a result of permit conditions contained in the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including updated information about the Permit, any amended permit and any further permit). The Tenant shall refer to, inter alia, Conditions 4.1 to 4.14 (and Annexes A and B) and Conditions 3.7 and 3.8 (and Figures 2 and 3) of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 regarding measures to mitigate air quality impact, measures to mitigate hazard to life impact, measures to prevent land contamination, measures to mitigate landfill gas hazard, maintenance of landscape and visual measures (see also hereinbelow regarding Condition 5 of the Environmental Permit and specified Ordinances).
  - (d) All information, conditions, submissions, mitigation measures, orders, notices and requirements under ongoing surveillance and monitoring activities during all stages of the Project and during the tenancy under the Tenancy Agreement (e.g. any additional mitigation measures recommended and to be recommended under the Process Review and Design Audit (carried out and to be carried out in accordance with the EM&A Manual) for various environmental impacts including, but not limited to, noise pollution, air quality, hazard to life, landfill gas hazard, landscape and visual measures, waste management and land contamination).
  - (e) All recommendations referred to in the documents of the EIAO Register which are not expressly referred to in Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 and any amended Environmental Permit (unless expressly excluded or impliedly amended in the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 and any amended Environmental Permit).
- 9.2 Further to Condition Nos. 6 and 8 hereinabove, the Tenant shall at its own cost provide relevant environmental monitoring data, information, documents and assistance to the Director and/or the Environmental Protection Department and shall permit authorised representatives of the Environmental Protection Department to access, inspect, take samples and monitor the Premises and operations for the Process Review and the Design Audit carried out and/or to be carried out pursuant to Conditions 4.1 and 5 of the Environmental

- Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (and any updated Permit, amended permit and further permit).
- 9.3 If the Tenant's operations (i.e. activities and facilities for recovery and/or recycling and/or reprocessing) are not covered by the EIA Report and/or deviate from the development parameters mentioned in inter alia the EIA Report, the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including the parameters at Annex A) and/or any environmental licence (e.g. the Water Treatment Facility ("WTF") Discharge Licence), and if additional mitigation measures are not available or are not effective in the opinion of the Director, to ensure compliance with the EIA Report, the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including any updated Permit, amended permit and further permit) and the relevant environmental licence(s), the Tenant shall comply with any modified parameters and/or the Tenant shall immediately modify its operations in such a way that the findings and requirements of the EIA Report, the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including any updated Permit, amended permit and further permit) and the environmental licence(s) are complied with and shall immediately cease to continue the offending part of the operations or activity in question.
- 9.4 The Tenant shall at its own cost(s) apply for, obtain, renew, maintain and comply with all the relevant licences related to compliance with all relevant Ordinances, by-laws, regulations, statutory technical memorandums, codes of practice, rules, non-statutory guidance notes, schemes, abatement notices and the environmental permits for the time being in force in Hong Kong (including those relating to the environment and governing the control of any form of pollution). The Tenant shall obtain, renew and comply with all the said licences within the relevant time limits (in any event, within one (1) calendar month of the date of signing and/or execution of the Tenancy Agreement), shall comply with all abatement notices, orders, directions and requests of the relevant authorities and public officers and shall be responsible for paying all relevant fees, costs, fines and penalties.
- 9.5 The Tenant shall not do anything or omit to do anything which would cause, contribute to or involve a breach or potential breach by the Director relating to any of the matters mentioned in Conditions 9.1 to 9.4 hereinabove (and other Conditions hereinbelow).
- 9.6 The Tenant shall fully indemnify the Government and/or the Director for any fees, costs, damages, expenses, fines, penalties, losses and claims arising (a) out of any breach of any of the matters mentioned in inter alia Conditions 9.1 to 9.4 hereinabove (and other Conditions hereinbelow) or (b) from the use of the Premises or (c) out of any works carried out at any time during the term to or at the Premises or (d) out of anything now or during the term attached to or projecting from the Premises or (e) from any neglect or default by the Tenant or by its respective servants or agents or by any express licensee of the Tenant.

## **SPECIFIC ENVIRONMENTAL RESPONSIBILITIES**

### Air Pollution

10. Save with an appropriate exemption under the Air Pollution Control Ordinance (Cap. 311 of the Laws of Hong Kong) any regulations made thereunder and any amending legislation, the Tenant shall not install or permit or suffer to be installed upon the Premises or any part thereof or any building(s) or structure(s) or part of any building(s) or structure(s) erected or to be erected thereon any furnace, oven, chimney or flue or any other combustion equipment or use or permit or suffer to be used any fuel or any method or process of manufacture or treatment that might in any circumstance result in, cause or contribute to the discharge or emission of any pollutant or any noxious, harmful or corrosive matter, whether it be in the form of gas, smoke, liquid, solid or otherwise (including but not limited to air pollutant as defined in Section 2 of the Air Pollution Control Ordinance (Cap. 311 of the Laws of Hong Kong)), which exists or which is imminent, without the prior written approval of the Director.
11. No alteration to the installation and method of manufacture shall be made without the prior written consent of the Director. In any event, the Tenant shall at its own cost(s) comply with, inter alia, Conditions 4.2 to 4.7 and Annex A of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 regarding

design, installation and operation of chimney, location of fresh air intakes and use of ultra-low sulphur or other cleaner fuel(s) as agreed by the Director (and the conditions of any updated Permit, amended permit and further permit regarding measures to mitigate air quality impact), good practices and relevant provisions of the EIA Report and Final EM&A Manual.

#### Noise Pollution

12. The Tenant shall take all necessary measures as may be required by and to the satisfaction of the Director to ensure that the operation of all plant and equipment, installed or used on the Premises or in any building(s) or structure(s) or any part of any building(s) or structure(s) erected or to be erected thereon, will not result, not cause and/or will not contribute any noise (which exists or which is imminent) which disturbs or annoys the residents or occupiers of any adjoining or neighbouring lot or lots or premises, or causes and/or contributes to disturbance to the general public under the Noise Control Ordinance (Cap. 400 of the Laws of Hong Kong) any regulations made thereunder and any amending legislation.
13. The decision of the Director as to whether any such plant and equipment are causing disturbance or annoyance as aforesaid shall be final and binding on the Tenant.

#### Waste Management

14. The Tenant shall not permit, allow or suffer any fuel or chemical and any sewage, waste water or effluent containing sand, cement, silt or any suspended or dissolved material to flow, escape or run from the Premises onto any adjoining land or allow any waste matter which does not form part of the recovery and/or recycling and/or reprocessing operation or is not part of the final product of such operation to be deposited, kept, held or stored anywhere within the Premises and other areas of EcoPark. The Tenant shall at its own cost(s) have all such matters and all waste arising from recycling activities, chemical waste arising from maintenance of plant and equipment, sewage sludge (from WTF) and general daily waste from the operation removed from the Premises or any building(s) or structure(s) or any part of any building(s) or structure(s) erected or to be erected thereon in a proper manner to the satisfaction of the Director.
15. In any event, the Tenant shall at its own cost(s) comply with, inter alia, Conditions 4.11 and 4.12 of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 regarding paving all areas of the Premises with concrete/using concrete hardstanding and siting all fuel tanks and chemical storage areas on the specified sealed areas, respectively (and comply with the conditions of any updated Permit, amended permit and further permit regarding measures to prevent land contamination). The Tenant shall at its own cost(s) comply with relevant provisions of the Waste Disposal Ordinance (Cap.354 of the Laws of Hong Kong) good practices and relevant provisions of the EIA Report and Final EM&A Manual.

#### Water Pollution

16. In the event that the Tenant produces, generates, permits, causes, allows or suffers any discharge which is subject to control under the Water Pollution Control Ordinance (Cap. 358 of the Laws of Hong Kong) any regulations made thereunder and any amending legislation, and is not covered by a WTF Discharge Licence issued under the Water Pollution Control Ordinance (Cap. 358 of the Laws of Hong Kong) the Tenant shall apply to the Director for a licence and comply with the terms and conditions stipulated in the licence and the WTF Discharge Licence at the Tenant's own cost(s). Otherwise, the Tenant is not allowed to discharge directly or indirectly or to produce, generate, permit, cause, allow or suffer any discharge into any public sewer, storm-water drain, channel, stream-course, sea or any area inside or outside the Premises any trade effluent or foul or contaminated water or cooling or hot water. Subject to the said licence from the Director and WTF Discharge Licence, the Tenant shall at its own cost(s) separate, collect, discharge and send all process or industrial wastewater to the WTF for treatment to the standard required for discharge into a sewer leading to the sewage treatment works at Pillar Point or other treatment works specified in the licence.
17. Subject to obtaining advance written approval of the Director, the Tenant shall at its own cost(s) provide, install, operate and maintain its own waste water pre-treatment plants within the Premises if such process or industrial wastewater could not meet the influent limits / exceeds the maximum influent criteria of the WTF (in accordance with paragraph 7.2.9 of the

Final E&MA Manual). The Tenant shall at its own cost(s) separate, collect, discharge and send all domestic wastewater (i.e. other than process or industrial wastewater) to the Pillar Point Sewage Treatment Works directly for treatment or other treatment works specified in the licence.

18. In any event, the Tenant shall prevent any spilled materials from entering the surface water drainage system and prevent contamination of the sea at its own cost(s) by, inter alia, providing, installing, operating and maintaining stop-logs or interceptors in the surface water drainage system and at the marine frontage area, respectively, or as required by the licence. The Tenant shall at its own cost comply with relevant provisions of the Dumping at Sea Ordinance (Cap 466 of the Laws of Hong Kong) good practices and relevant provisions of the EIA Report and Final EM&A Manual.

#### Hazard to Life Impact

19. To mitigate hazard to life impact, the Tenant shall comply with, inter alia, Conditions 4.8 to 4.10 of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (and comply with the conditions of any updated Permit, amended permit and further permit regarding measures to mitigate hazard to life impact) and shall not:-
- (a) Bring, keep, store or transport chlorine within the Premises and other areas of EcoPark;
  - (b) Bring, keep, store, locate or transport dangerous goods, substances and fuels supporting combustion including oxygen, acetylene, hydrogen peroxide, rubber tyres and diesel within 10 metres from the boundary of the site of EcoPark; and
  - (c) Exceed the building height restrictions for buildings on the Premises which are on/near the western boundary of the site of EcoPark as mentioned in Annex B to the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 (including any updated Permit, amended permit and further permit).

#### Landfill Gas Hazard

20. To mitigate landfill gas hazard, the Tenant shall at its own cost(s) comply with, inter alia, Condition 4.13 of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 regarding raising clear of the ground all buildings and enclosed structures as specified in inter alia Condition 3.7 (and comply with the conditions of any updated Permit, amended permit and further permit regarding measures to mitigate hazard to life impact).

#### Landscape and Visual Impacts

21. To mitigate landscape and visual impacts, the Tenant shall at its own cost(s) comply with, inter alia, Condition 4.14 of the Environmental Permit No. EP-226/2005 as amended by the Variation of Environmental Permit – Application No.VEP-221/2006 regarding maintaining landscape, planting, treatment and mitigation measures as specified in inter alia Condition 3.8 and Figure 3 (and comply with the conditions of any updated Permit, amended permit and further permit regarding measures to mitigate landscape and visual impacts).

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## APPENDIX 3

### Material and Waste Throughputs

## A3.1 CHAMPWAY TECHNOLOGY LIMITED (EP07-03)

Date	Waste Input (kg)			Product Output (kg)				Waste Disposal (kg)			
	Cooking Oil	Grease Trap Waste	Total	Treated Cooking Oil	Biodiesel	Glycerin	Total	Inorganic Waste	Organic Waste	Water Waste [Note 1]	Total
Oct-08	120,000	-	120,000	-	-	-	-	-	-	-	-
Nov-08	8,000	-	8,000	-	-	-	-	-	-	-	-
Dec-08	2,000	-	2,000	-	-	-	-	-	-	-	-
Jan-09 [Note 2]	93,454	-	93,454	86,912	-	-	86,912	-	4,673	1,869	6,542
Feb-09	86,855	-	86,855	80,775	-	-	80,775	-	4,343	1,737	6,080
Mar-09	88,883	-	88,883	82,661	-	-	82,661	-	4,444	1,778	6,222
Apr-09	82,530	-	82,530	76,753	-	-	76,753	-	4,127	1,650	5,777
May-09	91,022	-	91,022	84,650	-	-	84,650	-	4,551	1,820	6,371
Jun-09	114,143	-	114,143	106,153	-	-	106,153	-	5,707	2,283	7,990
Jul-09	106,287	-	106,287	98,847	-	-	98,847	-	5,314	2,126	7,440
Aug-09	115,096	58,190	173,286	161,156	-	-	161,156	-	8,664	3,466	12,130
Sep-09	125,091	41,950	167,041	155,348	-	-	155,348	-	8,352	3,341	11,693
Oct-09	145,139	324,800	469,939	437,043	-	-	437,043	-	23,497	9,399	32,896
Nov-09	111,053	215,600	326,653	303,787	-	-	303,787	-	16,333	6,533	22,866
Dec-09 [Note 2]	117,688	85,600	203,288	189,058	-	-	189,058	-	10,164	4,066	14,230
Jan-10	122,673	19,780	142,453	132,481	-	-	132,481	-	7,123	2,849	9,972
Feb-10	105,641	-	105,641	98,246	-	-	98,246	-	5,282	2,113	7,395
Mar-10	110,579	-	110,579	102,838	-	-	102,838	-	5,529	2,212	7,741
Apr-10	110,624	69,780	180,404	167,776	-	-	167,776	-	9,020	3,608	12,628
May-10 [Note 2]	110,943	142,630	253,573	235,823	-	-	235,823	-	12,679	5,071	17,750
Jun-10 [Note 2]	113,741	74,940	188,681	175,474	-	-	175,474	-	9,434	3,774	13,208
Jul-10 [Note 2]	117,570	150,840	268,410	249,621	354,730	17,737	622,088	15,264	13,420	5,368	34,052
Aug-10 [Note 2]	123,459	134,180	257,639	216,418	440,590	22,030	679,038	16,200	14,685	5,147	36,032

Date	Waste Input (kg)			Product Output (kg)				Waste Disposal (kg)			
	Cooking Oil	Grease Trap Waste	Total	Treated Cooking Oil	Biodiesel	Glycerin	Total	Inorganic Waste	Organic Waste	Water Waste [Note 1]	Total
Sep-10 [Note 2]	107,014	145,980	252,994	235,285	374,180	18,709	628,174	11,664	12,650	5,060	29,374
Oct-10 [Note 2]	96,075	231,380	327,455	304,533	125,380	6,269	436,182	26,208	16,373	6,549	49,130
Nov-10	103,531	62,830	166,361	139,697	245,410	7,362	392,469	12,640	9,510	17,154	39,304
Dec-10	125,151	114,360	239,511	190,158	381,880	11,456	583,494	14,000	27,744	39,129	80,873

**Notes:**

1. Water waste includes slurry and semi-solid waste and is disposed of at landfill
2. Updated throughout data as advised by Tenant after the corresponding Quarterly EM&A Reports were submitted



## A3.2 SHIU WING STEEL LIMITED (EP08-03)

Date	Waste Input (kg)	Product Output (kg)			Waste Disposal (kg)
	Waste Metal / Steel Scrap / Construction Waste	Light Ferrous Scrap (Baled)	Heavy Ferrous Scrap (Sheared)	Total	Non-ferrous Scrap / General Refuse
Apr-10 <sup>[Note 1]</sup>	220,000	-	220,000	220,000	-
May-10	-	-	-	-	-
Jun-10	-	-	-	-	-
Jul-10	1,396,000	-	1,396,000	1,396,000	-
Aug-10	398,000	-	398,000	398,000	-
Sep-10	870,660	-	870,660	870,660	-
Oct-10	1,166,850	-	1,166,850	1,166,850	-
Nov-10	275,790	-	275,790	275,790	-
Dec-10	234,240	-	234,240	234,240	-

**Note:**

1. Updated throughout data as advised by Tenant after the corresponding Quarterly EM&A Report was submitted

### A3.3 HONG KONG HUNG WAI WOODEN BOARD COMPANY (EP06-034)

Date	Waste Input (kg)	Product Output (kg)	Waste Disposal (kg)
	Waste Wood	Wooden Board	General Refuse
Jun-08	21,000	-	-
Jul-08	7,000	-	-
Aug-08	-	-	-
Sep-08	8,000	-	-
Oct-08	1,000	-	-
Nov-08	1,000	-	-
Dec-08	-	-	-
Jan-09	60	-	-
Feb-09	60	-	-
Mar-09	-	-	-
Apr-09	-	-	-
May-09	-	-	-
Jun-09	-	-	-
Jul-09	-	-	-
Aug-09	-	-	-
Sep-09	-	-	-
Oct-09	-	-	-
Nov-09	-	-	-
Dec-09	-	-	-
Jan-10	-	-	-
Feb-10	-	-	-
Mar-10	-	-	-
Apr-10	141,880	-	-
May-10	1,758,000	1,758,000	-

Date	Waste Input (kg)	Product Output (kg)	Waste Disposal (kg)
	Waste Wood	Wooden Board	General Refuse
Jun-10	1,000,000	1,000,000	-
Jul-10	90,000	90,000	-
Aug-10 <sup>[Note 1]</sup>	204,000	472,000	-
Sep-10 <sup>[Note 1]</sup>	264,500	-	-
Oct-10	365,120	365,120	-
Nov-10	415,830	300,000	-
Dec-10	253,000	300,000	-

**Note:**

1. Updated throughout data as advised by Tenant after the corresponding Quarterly EM&A Report was submitted

## A3.4 LI TONG GROUP (EP07-02)

Date	Waste Input (kg)	Product Output (kg)			Waste Disposal (kg)
	WEEE	Metals (e.g. ferrous materials, aluminium)	Non-metals (e.g. fibres, plastics)	Total	General Refuse
Sep-10	8,103	430	3,085	3,515	-
Oct-10	35,672	3,548	8,919	12,467	-
Nov-10	24,918	3,674	12,876	16,550	-
Dec-10	16,483	1,521	8,727	10,248	-

## A3.5 HONG KONG TELFORD ENVIROTECH GROUP LIMITED (EP08-01)

Date	Waste Input (kg)	Product Output (kg) <sup>[Note 1]</sup>	Waste Disposal (kg) <sup>[Note 1]</sup>
	Waste Plastic	PO, PE, PET, PWC	General Refuse
Jul-09	20,000	-	-
Aug-09	-	-	-
Sep-09	-	-	-
Oct-09	-	-	-
Nov-09	-	-	-
Dec-09	-	-	-
Jan-10	-	-	-
Feb-10	-	-	-
Mar-10	-	-	-
Apr-10	-	-	-
May-10	2,600	-	-
Jun-10	5,300	-	-
Jul-10	13,000	-	-
Aug-10	13,000	-	-
Sep-10	-	-	-
Oct-10	9,700	-	-
Nov-10	10,000	-	-
Dec-10	70,000	-	-

**Note:**

1. Tenant has not yet commenced recycling process within the lot

## A3.6 YAN OI TONG LIMITED (P7)

Date	Waste Input (kg)	Product Output (kg)	Waste Disposal (kg)
	Waste Plastic	Processed Plastic	General Refuse
Apr-10 <sup>[Note 1]</sup>	80,878	44,790	14,849
May-10 <sup>[Note 1]</sup>	23,806	23,414	4,666
Jun-10 <sup>[Note 1]</sup>	91,852	22,366	7,321
Jul-10 <sup>[Note 1]</sup>	40,878	30,901	12,669
Aug-10	29,603	34,240	21,745
Sep-10	96,868	47,638	13,636
Oct-10	80,897	55,446	10,154
Nov-10	60,538	67,047	10,458
Dec-10	109,858	79,992	15,496

**Note:**

1. Updated throughout data as advised by Tenant after the corresponding Quarterly EM&A Report was submitted

## A3.7 ST. JAMES' SETTLEMENT (P5)

Date	Waste Input (kg)	Product Output (kg)					Waste Disposal (kg)
	WEEE	Repaired / Refurbished EEE (unit) <sup>[Note 1]</sup>	Reusable Parts	Metals (e.g. ferrous materials, aluminium)	Non-metals (e.g. fibres, plastics)	Total	General Refuse
Oct-10	3,500	190	-	-	-	190 unit	-
Nov-10	15,900	2,590	-	-	-	2,590 unit	288
Dec-10	22,000	3,100	-	-	-	3,100 unit	1,637

**Note:**

1. Updated unit as advised by Tenant after the corresponding Quarterly EM&A Report was submitted

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## APPENDIX 4

### Calibration Certificate of Infrared Gas Analyser



**FUGRO TECHNICAL SERVICES LIMITED**

MaterialLab Division,  
Fugro Development Centre,  
5 Lok Yi Street, 17 M.S. Castle Peak Road,  
Tai Lam, Tuen Mun, N.T., Hong Kong.

Tel : +852-2450 8233  
Fax : +852-2450 6138  
E-mail : matlab@fugro.com.hk  
Website : www.materiallab.com.hk

**MaterialLab****REPORT ON CALIBRATION OF INFRA RED GAS ANALYSER**

Client : Fugro Technical Services Limited – MaterialLab Division

Sample description : One sample of Infra Red Gas Analyser (GA94A)

Sample identification : E / 084 / 1

Serial number : GA3385

Test required : Calibration

Date of calibration : 22/01/2010

Next calibration date : 22/07/2010

Method used : In-house method (Comparison with Standard Gas)

**Results :**

Parameters	Standard Gas Concentration, % volume	Infra Red Gas Analyser Reading, % volume	Deviation, % volume
Methane (CH <sub>4</sub> )	1.02	1.0	-0.02
Carbon dioxide (CO <sub>2</sub> )	1.01	1.0	-0.01
Oxygen (O <sub>2</sub> )	1.03	0.9	-0.13

Calibrated by : C. F. Leung

Certified by Raymond K. F. Wong  
Approved Signatory : Raymond K. F. Wong  
Assistant Manager – Chemical & Environmental

Date : 22/01/2010*Note : This report refers only to the sample(s) tested.*

# FUGRO TECHNICAL SERVICES LIMITED

Materialab Division,  
Fugro Development Centre,  
5 Lok Yi Street, 17 M.S. Castle Peak Road,  
Tai Lam, Tuen Mun, N.T., Hong Kong.

Tel : +852-2450 8233  
Fax : +852-2450 6138  
E-mail : matlab@fugro.com.hk  
Website : www.materialab.com.hk

## Materialab

### REPORT ON CALIBRATION OF INFRA RED GAS ANALYSER

Client : Fugro Technical Services Limited – Materialab Division

Sample description : One sample of Infra Red Gas Analyser (GA94A)

Sample identification : E / 084 / 1

Serial number : GA3385

Test required : Calibration

Date of calibration : 06/07/2010

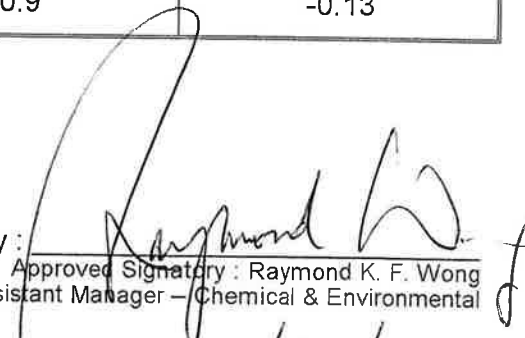
Next calibration date : 06/01/2011

Method used : In-house method (Comparison with Standard Gas)

#### Results :

Parameters	Standard Gas Concentration, % volume	Infra Red Gas Analyser Reading, % volume	Deviation, % volume
Methane (CH <sub>4</sub> )	1.02	1.0	-0.02
Carbon dioxide (CO <sub>2</sub> )	1.01	1.0	-0.01
Oxygen (O <sub>2</sub> )	1.03	0.9	-0.13

Calibrated by : C. F. Leung

Certified by :   
Approved Signatory : Raymond K. F. Wong  
Assistant Manager – Chemical & Environmental

Date : 06/07/2010

*Note : This report refers only to the sample(s) tested.*

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## APPENDIX 5

### Graphical Plots of LFG Monitoring

## Landfill Gas Monitoring Results - January to December 2010

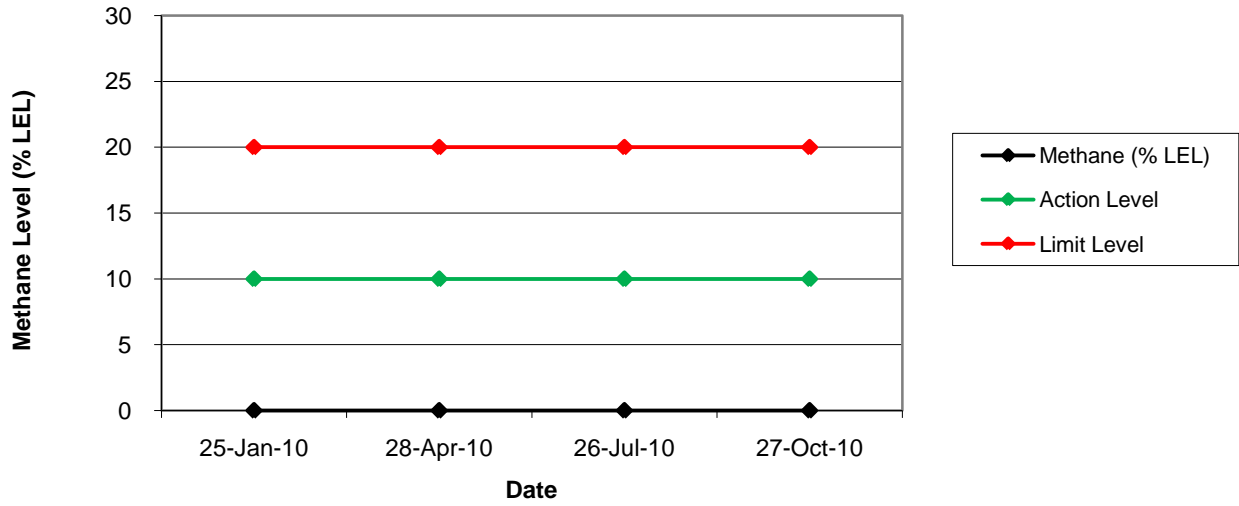
Monitoring Station ID	Monitoring Locations	Date	Weather Conditions	Temperature (degree)	Start Time	End Time	Measurement Results				Action Level			Limit Level			Remarks	
							Methane		Oxygen	Carbon Dioxide	Barometric Pressure	Methane	Oxygen	Carbon Dioxide	Methane	Oxygen		Carbon Dioxide
							% v/v	% LEL	% v/v	% v/v	mBar (absolute)	% LEL	% v/v	% v/v	% LEL	% v/v		% v/v
EP1-1	Inside the landscaping area of Administration Building	25-Jan-10	Hazy	17	10:20	10:25	0.0	0	21	0.4	1023	<u>&gt; 10</u>	<u>&lt; 19</u>	<u>&gt; 0.5</u>	<u>&gt; 20</u>	<u>&lt; 18</u>	<u>&gt; 1.5</u>	Nil
EP1-2	PCCW below-ground chamber outside Lot EP08-01				10:30	10:35	0.0	0	21	0.0	1023							Nil
EP1-3	HGC Broadband below-ground chamber outside Lot EP08-03				10:40	10:45	0.0	0	21	0.0	1023							Nil
EP1-1	As above	28-Apr-10	Fine	21	10:17	10:22	0.0	0	21	0.0	1013							Nil
EP1-2					10:26	10:31	0.0	0	21	0.0	1013							Nil
EP1-3					10:34	10:39	0.0	0	21	0.0	1013							Nil
EP1-1	As above	26-Jul-10	Fine	30	10:41	10:46	0.0	0	19	0.2	1004							Nil
EP1-2					10:28	10:33	0.0	0	20	0.0	1005							Nil
EP1-3					10:12	10:17	0.2	4	21	0.0	1004							Nil
EP1-1	As above	27-Oct-10	Fine	21	09:40	09:45	0.0	0	21	0.0	1018							Nil
EP1-2					09:50	09:55	0.0	0	21	0.0	1018	Nil						
EP1-3					10:05	10:10	0.0	0	20	0.0	1019	Nil						

Note:

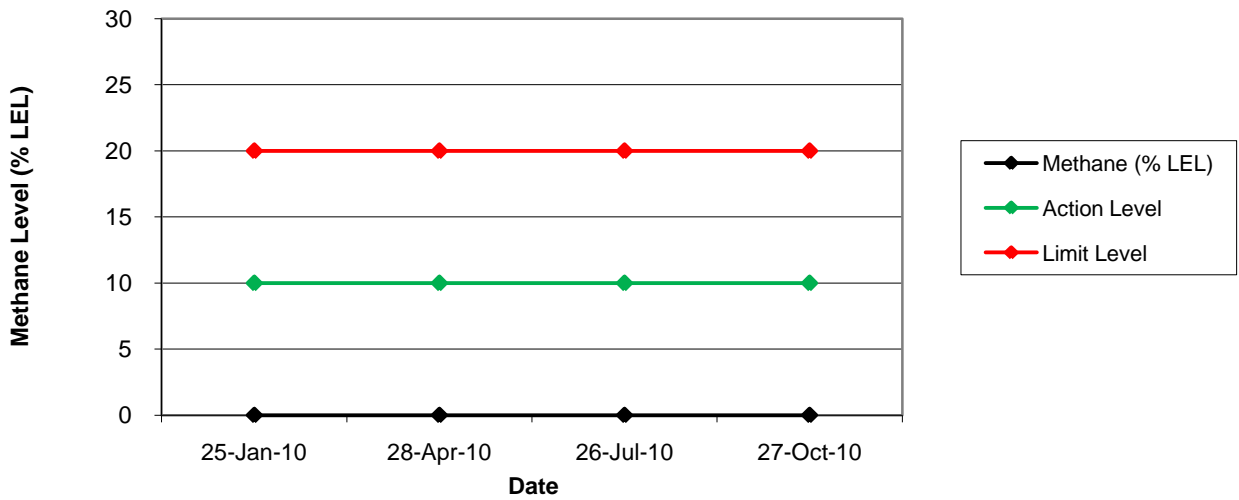
(1) Underlined figure indicates an exceedance of Action Level

(2) Shaded area indicates an exceedance of Limit Level

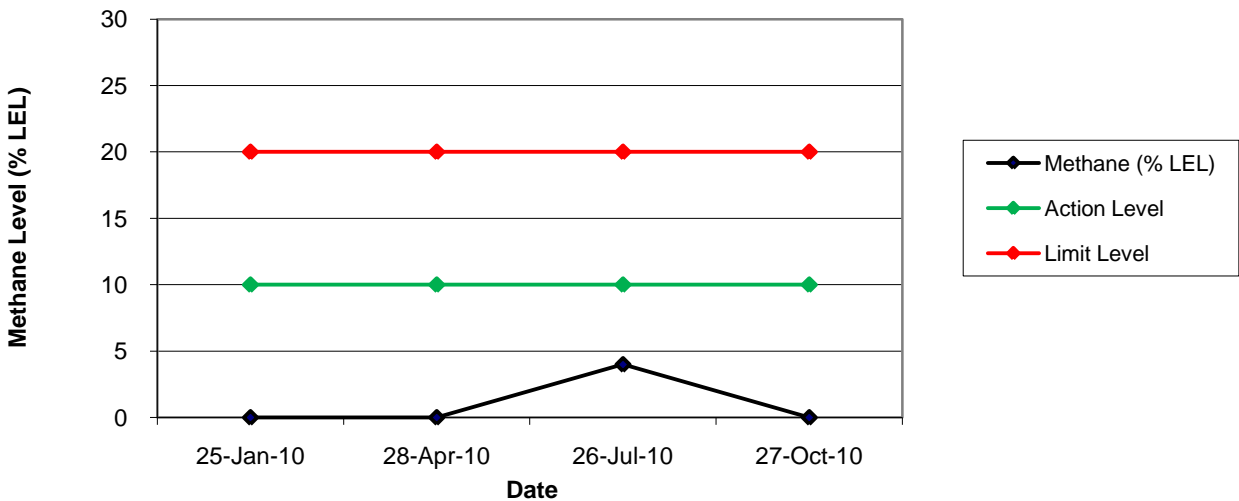
Measured Methane Level (% LEL) at EP1-1



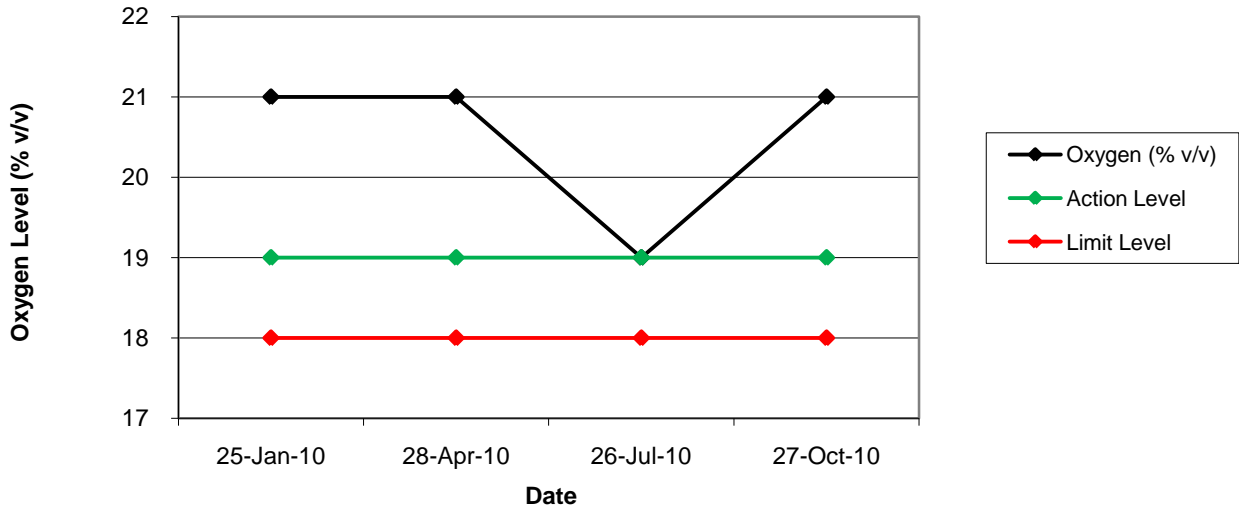
Measured Methane Level (% LEL) at EP1-2



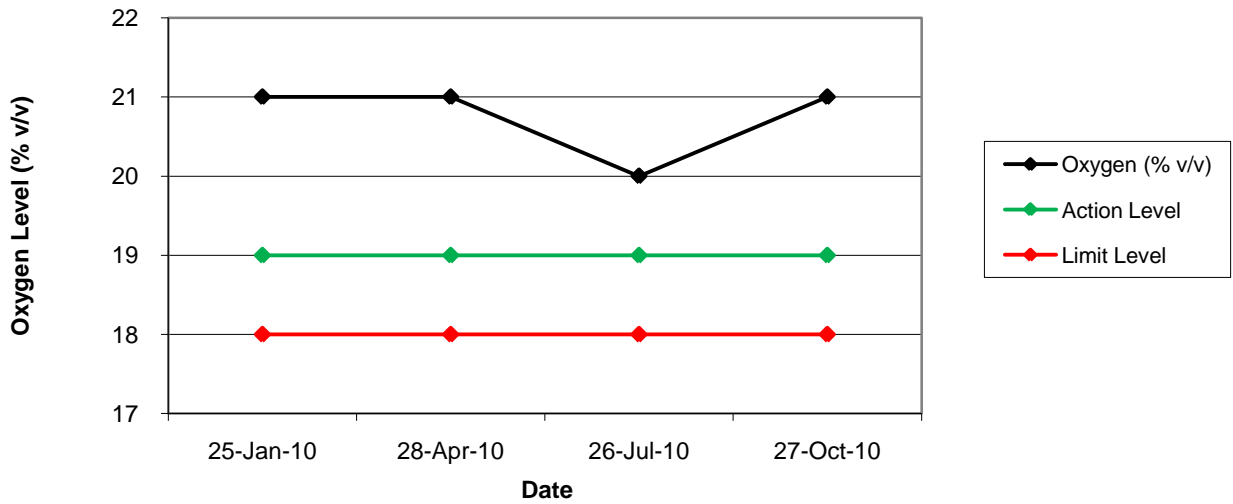
Measured Methane Level (% LEL) at EP1-3



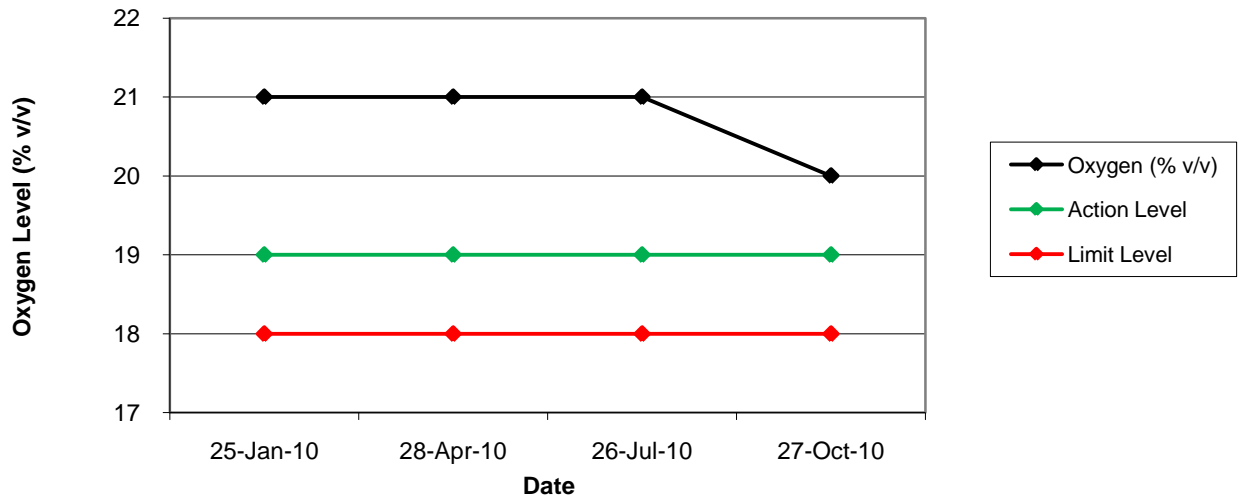
Measured Oxygen Level (% v/v) at EP1-1



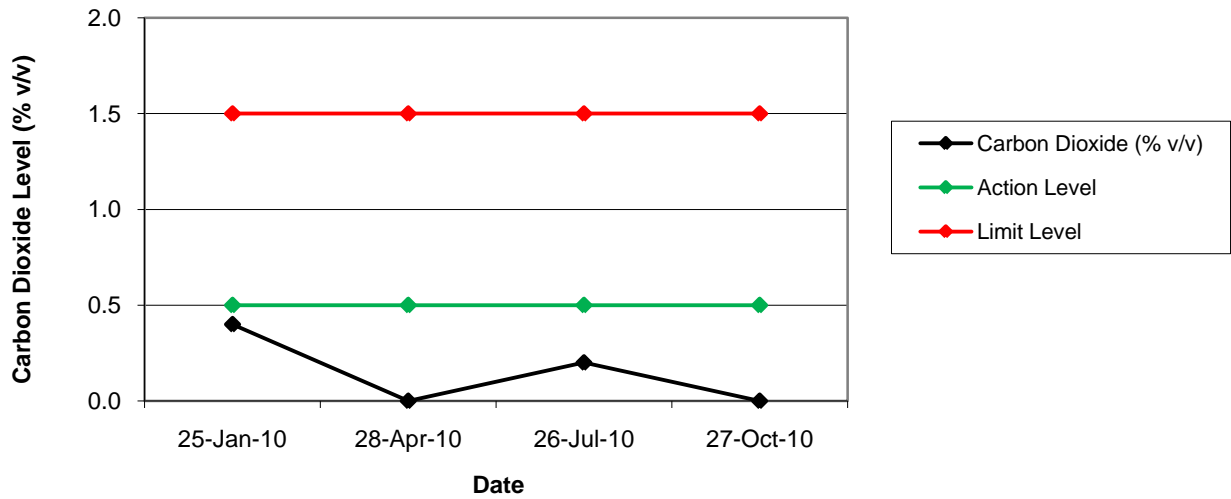
Measured Oxygen Level (% v/v) at EP1-2



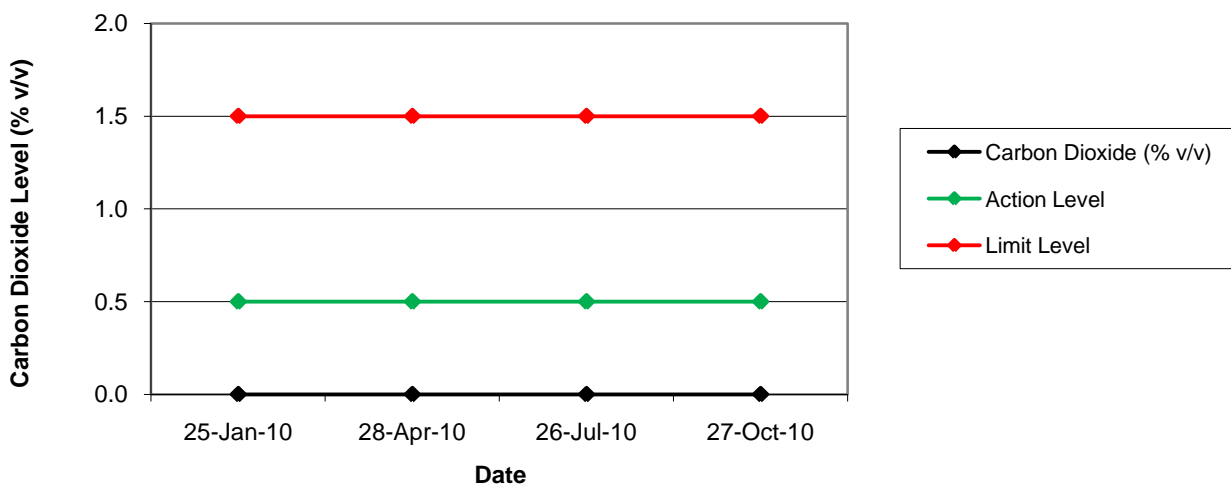
Measured Oxygen Level (% v/v) at EP1-3



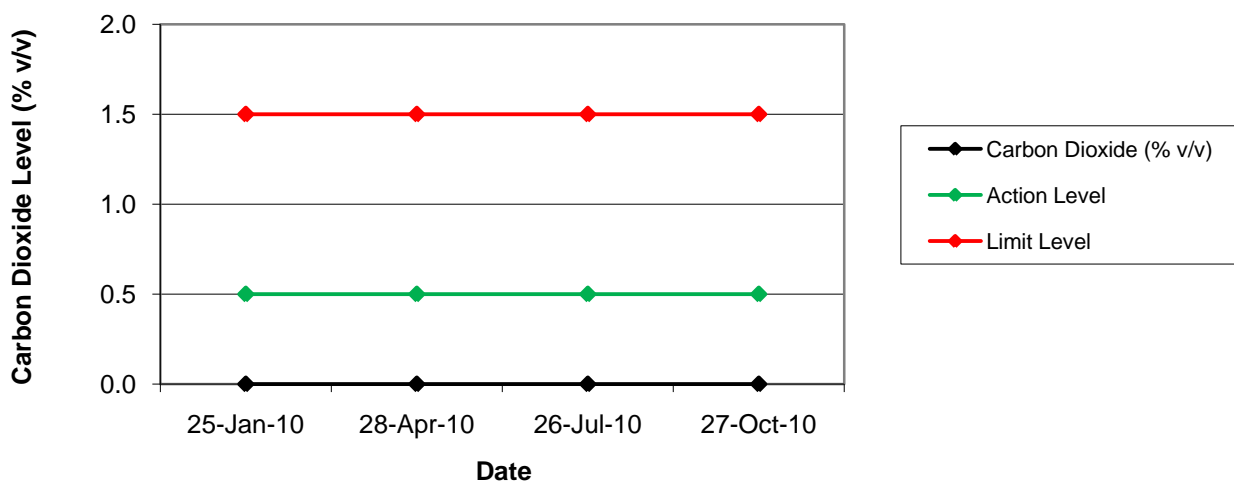
Measured Carbon Dioxide Level (% v/v) at EP1-1



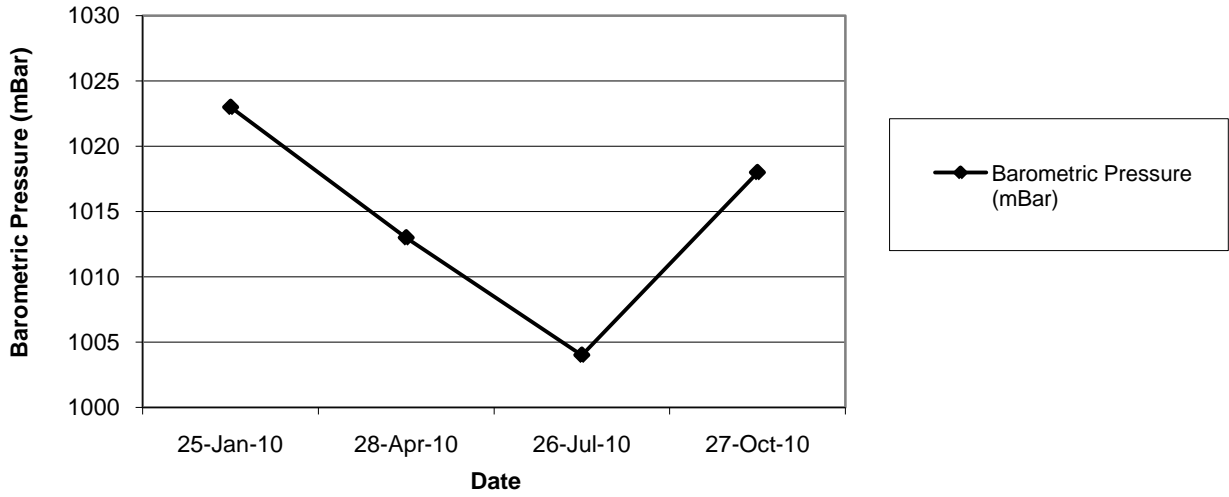
Measured Carbon Dioxide Level (% v/v) at EP1-2



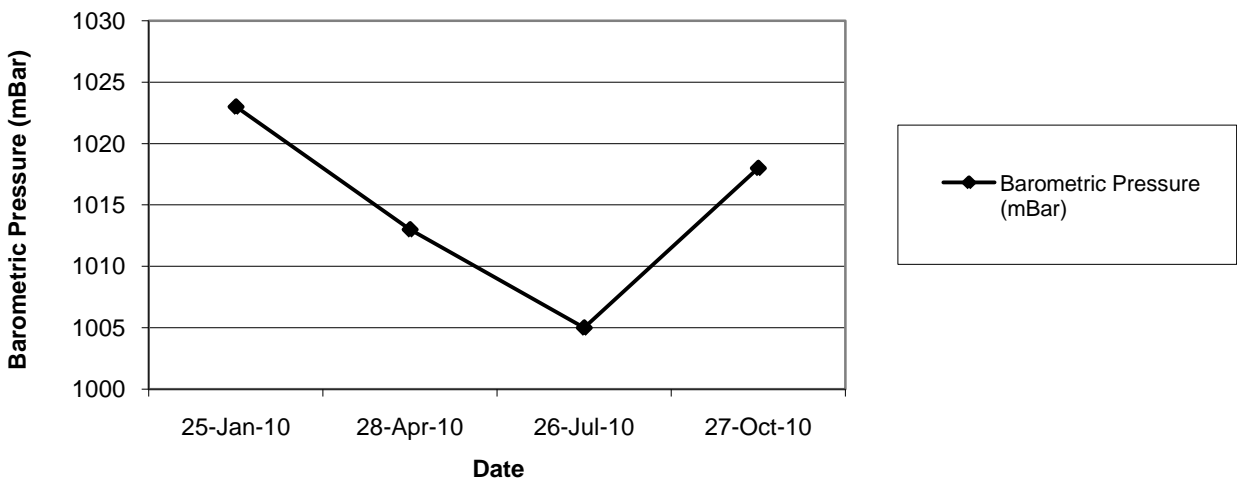
Measured Carbon Dioxide Level (% v/v) at EP1-3



**Measured Barometric Pressure (mBar) at EP1-1**



**Measured Barometric Pressure (mBar) at EP1-2**



**Measured Barometric Pressure (mBar) at EP1-3**

