

**Contract No. : EP/SP/52/06**  
**Development of EcoPark in Tuen Mun Area 38**

**ENVIRONMENTAL MONITORING AND AUDIT**

**MONTHLY EM&A REPORT for**

**April 2009**

**Environmental Pioneers & Solutions Limited**  
8/F, Chaiwan Industrial Centre Building  
20 Lee Chung Street, Chaiwan, Hong Kong  
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## **APPROVAL SHEET**

DOCUMENT DATE: 30 April 2009

Prepared and Certified by: ET Leader (Environmental Pioneers & Solutions Limited)

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Miss Patricia Chung

Date: \_\_\_\_\_

Verified by: \_\_\_\_\_  
IEC\*

Date: \_\_\_\_\_

\* IEC – Independent Environmental Checker



**TABLE OF CONTENTS**

EXECUTIVE SUMMARY .....	4
1. BASIC PROJECT INFORMATION .....	6
2. SUMMARY OF WORK ACTIVITIES AND CONSTRUCTION STATUS.....	8
3. STATUS OF ENVIRONMENTAL PROTECTION AND SITE INSPECTIONS	10
4. SUMMARY OF ENVIRONMENTAL PERMIT AND LICENCES .....	18
5. CUMULATIVE LOG OF COMPLAINTS AND REMEDIAL ACTION .....	18
6. CUMULATIVE LOG OF NOTIFICATION OF SUMMONS AND PROSECUTIONS .....	18
7. CONCLUSION .....	18
APPENDIX 1 - SITE LAYOUT PLAN.....	20
APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF ECOPARK IN TUEN MUN AREA 38 .....	21
APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS.....	22
APPENDIX 4 - ORIGINAL LANDFILL GAS FIELD MEASUREMENT RECORDING SHEETS.....	23
APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS .....	28
APPENDIX 6 – Calibration Certificates for GEM 2000 .....	29



**EXECUTIVE SUMMARY**

This is the thirty-fourth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled “Development of EcoPark in Tuen Mun Area 38”. (Environmental Permit No. EP-226/2005).

This report contains the results and findings of site inspection activities and EM&A works carried out by the Environmental Team (ET) of the Works Contractor as required in the contract during April 2009.

The site activities in the reporting period mainly consisted of excavation and site formation works and construction of drainage in Phase II construction site.

Several environmental issues, such as improper accommodation of chemical drums, inadequate dust suppression measures and incompleteness of hoardings re-installation along Phase I and II construction site, have been identified by ET during weekly site inspections in the reporting month. Contractor has implemented some mitigation measures to address those problems as advised by ET. Some of the measures taken by the contractor were considered as effective to minimize negative impact to the environment. On-going investigation will be carried out to observe performance and effectiveness of those measures. Outstanding environmental items will be inspected in the following month.

LFG monitoring was carried out in April 2009 on weekly basis. The Landfill Gas (LFG) monitoring equipment (GEM 2000) has been re-calibrated and repaired for LFG monitoring, including oxygen level, since 09 April 2009. As instructed by Engineer’s Representatives, one more monitoring point at the proposed S3 manhole area has been added since 09 April 2009. The measurement results from ET shown in Table 3.5 were within Action and Limit Levels in accordance with EM&A manual.

There were no notifications of summons or successful prosecution during April 2009.



Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to investigate and monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by contractor, no further action has been taken by EPD in regard to the above incident.

Planned activities for May 2009 with regard to development of EcoPark consist of:

- 1) Site formation works,
- 2) Excavation works,
- 3) Road formation works and
- 4) Construction of drainage, sewerage & water mains



## **1. BASIC PROJECT INFORMATION**

### **1.1 Introduction**

This is the thirty-fourth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled “Development of EcoPark in Tuen Mun Area 38”. The site layout plan is shown in Appendix 1. The report was prepared by the Environmental Team, Environmental Pioneers & Solutions Limited, of the Works Contractor, Kaden Construction Limited. The report is to be submitted to the Works Contractor, the Engineer and the Environmental Protection Department for the project.

This report presents the results of the environmental monitoring of the project activities conducted during the month of April 2009. This included regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the EM&A Manual and the Contractor’s Environmental Management Plan (EMP).

The construction works of Phase I have already commenced in July 2006 and have been completed in November 2008.

The construction works of Phase II commenced in December 2008 and is anticipated to be completed in December 2009.

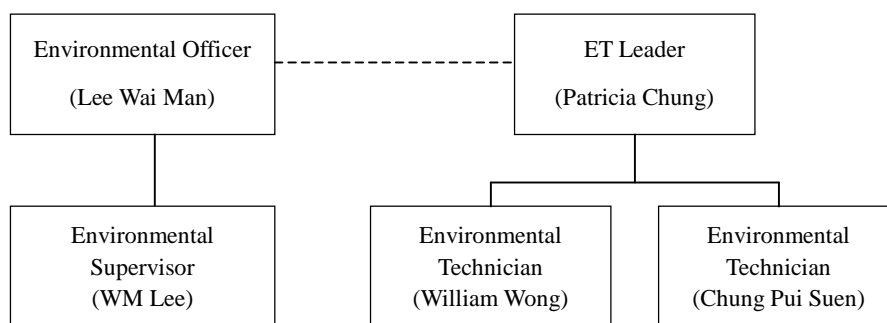
The contact person and telephone number of key personnel for the captioned project are shown in Appendix 2.

### **1.2 Project Organization and Management**

The Works Contractor has commissioned Environmental Pioneers & Solutions Limited as the Environmental Team, which comprises the environmental team leader and the environmental technicians to undertake the environmental monitoring and audit work for this project. The project Organization Chart of Environmental Team is shown in Figure 1.1.



Figure 1.1 Organization Chart of Environmental Team





## 2. SUMMARY OF WORK ACTIVITIES AND CONSTRUCTION STATUS

### 2.1 Works Undertaken during the Month

A summary of the site installation works in this month, with the information of locations, activities, equipment/materials and dates of occurrence, is provided by the Contractor, as shown in Table 2.1.

Table 2.1 Work Activities for April 2009		
Item	Work Activities & Location	Date of Occurrence
1	Site formation works	01 Apr2009 – 30 Apr 2009
2	Excavation works	01 Apr2009 – 30 Apr 2009
3	Road Formation works	01 Apr2009 – 30 Apr 2009
4	Construction of drainage	01 Apr2009 – 30 Apr 2009

Machineries		
	Equipment/ Plant	Quantity
1	Mobile Crane	0
2	Excavator	6
3	Generator	2
4	Air Compressor	1
5	Roller	0
6	Loader	1
7	Grab Lorry	0
8	Crane Lorry	1
9	Water Truck	1
10	Dump Truck	1

Remarks:

- As informed by the Contractor, most equipment is mobile at site subject to work progress.
- Refer to Appendix 1 – Site layout plan for location of construction activities.



## 2.2 Future Key Issues

The Contractor has provided an updated construction program in Table 2.2 to show the planned activities for the coming month (May 2009). The anticipated environmental issues are summarized as follow:

Table 2.2 Construction Program and Anticipated Environmental Issues		
Item	Works	Anticipated Environmental Issues
1	Site formation works, excavation works & road works	<ul style="list-style-type: none"> <li>- Generation of C&amp;D waste; excavated material should be reused as much as practicable.</li> <li>- Dust may be generated; the wheel washing machine should be in operation.</li> <li>- Haul road should be sprayed regularly, by truck or sprinkler.</li> <li>- Stagnant water should be removed.</li> <li>- Mosquito mitigation measures should be implemented.</li> <li>- Landfill gas monitoring should be carried out.</li> </ul>
2	Construction of drainage, sewerage & water mains	<ul style="list-style-type: none"> <li>- Generation of C&amp;D waste; excavated material should be used as much as practicable</li> <li>- Dust may be generated; the wheel washing machine should be in operation</li> </ul>

The site inspection schedule for the next month (May 2009) is designated on 08, 15, 22 and 29 of May 2009.



### **3. STATUS OF ENVIRONMENTAL PROTECTION AND SITE INSPECTIONS**

#### **3.1 Environmental Site Inspections**

Environmental site inspections are required to inspect the construction activities of the Development of EcoPark in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Regular site inspections should be carried out by the ET once per week during construction phase.

Outstanding issues at the end of March 2009 includes:

- 1) Several chemical storage tanks without labels and drip pans have been found along Road F of Phase I construction site during March 2009. Contractor took action as advised to remove tanks that were not in use or provide drip pans for chemical drums as observed during site inspection carried out on 30 April 2009. Contractor was reminded that all chemical containers should be properly maintained in both Phase I and II construction sites.
- 2) Some of the hoardings along the interface of Phase I and II construction site was removed. Hoardings re-installation has been completed as observed during site inspection on 24 April 2009.
- 3) Well-constructed wheel washing bay was not available for wheel washing machine at the exit of Phase II construction site. Manual wheel-washing facilities were provided at the temporary site exit. Contractor was reminded that proper wheel washing machine and bay should be provided at the new exit of Phase II construction site as soon as possible.
- 4) Housekeeping was unsatisfactory around the designated refuse collection areas as observed on 20 March 2009 and 27 March 2009. Refuses stored in the refuse collection bucket were cleared as observed during inspection carried out on 09 April 2009.
- 5) Chemical drums without drip trays were observed at several locations in Phase II construction site during site inspection on 27 March 2009. Contractor took action to remove drums that were not in use or locate drums in the chemical storage cabinet.



- 6) Dusty stockpiles have been observed in several locations in Phase II construction site in March. Contractor was reminded to take dust suppression measures on site include covering stockpiles that are expected to stay long with tarpaulin. Contractor took action as advised as observed during site inspection carried out on 24 April 2009.

Site inspection of Phase I construction site was conducted on 09 April 2009. Special observations include:

- 1) Drip pan has not yet been provided for the three plastic chemical drums adjacent to the cooling tower in the administration building. ET was informed that a proper drip pan is being designed.
- 2) Several chemical storage tanks without labels and drip pans have been found along Road F of Phase I construction site. Contractor took action as advised to remove tanks that were not in use or provide drip pans for chemical drums as observed during site inspection on 30 April 2009.

Outstanding issues will be inspected in the next reporting month.

Site inspections for Phase II construction site were conducted on 03, 09, 17, 24 and 30 of April 2009.

A detailed checklist of each site inspection together with comments, relevant photos and maps have been filed and kept.

The findings and results of site inspections are provided in Table 3.1:

Table 3.1 Summary of Site Inspections for Phase II construction site during April 2009				
Date	Observations	Advice from ET	Action taken	Closing Date
April 09	Well-constructed wheel washing bay was not available for wheel washing machine at the entrance of Phase II construction site.	Contractor was reminded that proper wheel washing machine and bay should be provided at the new exit of Phase II construction site as soon as possible.	Manual wheel-washing facilities were provided at the temporary site exit.	To be followed in the next reporting month



Table 3.1 Summary of Site Inspections for Phase II construction site during April 2009

Date	Observations	Advice from ET	Action taken	Closing Date
April 09	Drainage system in Phase I construction site connected to two of the excavation pits near the waterfront. Water accumulated may discharge to the drainage system.	Contractor was reminded that any water treatment and discharge should comply with WPCO-TM standard. Proper containments should be provided to adopt water discharge to drainage system in Phase I construction site.	Barriers have been established with earth materials to avoid site water discharge to drainage system in Phase I construction site.	24 April 2009
03 April 09 09 April 09 17 April 09	Some of the hoardings along the interface of Phase I and II site have not been re-installed	Contractor was reminded again to re-install hoardings for dust control as far as practicable	Hoardings re-installation has been completed as observed during site inspection on 24 April 2009	24 April 2009
03 April 09 09 April 09 17 April 09	Dusty stockpiles have been observed in several locations in Phase II construction site	Contractor was reminded to take dust suppression measures on site include covering stockpiles that are expected to stay long with tarpaulin.	Action taken as advised.	24 April 2009
09 April 09 17 April 09	Chemical drums without drip trays were observed at several locations in Phase II construction site.	Contractor was reminded to provide drip trays for all chemical drums on site	Contractor took action to place chemical drums inside chemical storage area or remove drums that were not in use.	24 April 2009
09 April 09 17 April 09 24 April 09	Water and oily matters have been found accumulated at the trays of chemical storage cabinet	Contractor was reminded to always maintain the chemical storage cabinet in good condition.	Contractor took action to clear the oily matter and drums that were not in use in the cabinet as observed in 24 April 2009. Accumulated water was still observed however.	To be followed in the next reporting month.
17 April 09	Housekeeping was unsatisfactory around the waterfront area and	Contractor was reminded to place refuse in designated collection area.	Action taken as advised	24 April 2009
27 Mar 09	Waste skip at the designated refuse collection point was nearly full.	Contractor was reminded to dispose waste when the collection bucket is full	--	To be followed in the next reporting month

### 3.2 Air Dust

Excavation work is being carried out in Phase II construction site. Dust problem may be arisen when stockpiles of excavated materials are not enclosed, covered or dampened



during dry or windy conditions. Dust suppression measures such as water spraying and coverings with tarpaulin on stockpiles have been observed in the reporting month.

### 3.3 Noise

The major noise source was vehicle movement and machinery in the EcoPark. Since the nearby NSRs were remote, the noise impact was minimal. There was no specific observation noted regarding noise issue. The Contractor has obtained the Construction Noise Permit on 07 August 2007 but it had been expired on 28 Feb 2008. The contractor should renew the permit as necessary.

### 3.4 Surface Water Quality

Since there was no water discharge at manhole, the Contractor removed the silt curtain installed at discharge point on 4 April 2007, as agreed by the Engineer's Representative. No muddy water was observed at discharge point for Phase I construction site. As informed by Engineer's Representative, there was no direct water discharge at manhole in Phase II construction site. No muddy water discharge is expected.

Chemical toilets (1 nos.) have been provided in Phase II construction site by a licensed contractor, of which sewage generated is collected every three to five days without causing contamination on surface water. The Effluent Discharge License was issued to the Contractor on 20 November 2006.

The temporary storage tank was used to store the effluent of aerobic wastewater treatment system and the stored effluent was pumped away regularly. As checked by the ET, there was no effluent discharge into the storm water drain. To avoid any sewage overflow, frequent checking is required after the commencement of Phase II construction works.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to investigate and monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by contractor, no further action has been taken by EPD in regard to the above incident.



### 3.5 Visual and Landscape Impact

Hoarding was erected at the site egress and aligned along the site boundary along Lung Mun Road. Hoardings were specially designed to be movable for future re-use in other locations. Some of the hoardings have been removed at the interface between Phase I and Phase II construction site. Re-installation has been completed as observed during inspection carried out on 24 April 2009.

### 3.6 Waste / Chemical Waste

The Contractor implemented visual inspection and distributed flyers/ notices to ensure all dump trucks have mechanical covers closed when leaving EcoPark site.

Separate waste collection bins were made available for collecting aluminum cans, waste paper and plastic bottles etc. The Contractor has provided the revised site layout plan for refuse collection points as shown in Appendix 3.

Waste dumpers were used for the collection and storage of general waste. Temporary storage areas for waste metals and waste tyres were established in Phase I construction site. For Phase II construction site, a designated refuse collection point has been established and location is shown in Appendix 3.

Excavated materials are reused as back-fill material to balance cut and fill and hence reduce the generation of materials. Surplus materials are returned to stock in centralized area with suitable protective measures. The Contractor was reminded to comply with the requirements and conditions for disposal at public fill facility and all oversized aggregates should be crushed to less than 250mm before delivering to the public fill.

Materials are recycled and re-used at site as much as practicable to minimize waste generation. Timbers are recycled to make temporary tools and access ladders etc. Excavated rocks, concrete and asphalts are stored for future re-use in land formation and structural construction etc.

Registered waste collectors will be arranged to collect and transport the wastes



whenever necessary.

The Contractor has provided sufficient drip trays for all temporary electricity generators at site. These drip trays should be covered by tarpaulin sheet to minimize rainfall accumulation.

Table 3.4 provides a summary table of waste disposal in April 2009. The Contractor has been reminded to keep good record at site in order to have a clear presentation of waste disposal.

Table 3.4 Summary of Waste Disposal in April 2009			
Type of Waste	Disposal Site	Quantity	Remarks
General Waste	WENT Landfill	10 tonnes	-
Inert C&D Material	Public Fill Facility	0 tonnes	-

### 3.7 Landfill Gas

Landfill gas (LFG) monitoring equipment (GEM 2000) has been repaired and sent back on 09 April 2009. Calibration certificate is provided in Appendix 6.

LFG monitoring was carried out in April when there were excavations of 1m depth or more in Phase II construction site. As instructed by the Engineer's Representative, one more monitoring point, at manhole S3, has been added since 09 April 2009. LFG monitoring was carried out on site at four locations on 03 April 2009, and five locations on 09, 17, 24 and 30 April 2009.

Measurement results are summarized in Table 3.5. All results are within the Action / Limit Levels in accordance with the EM&A Manual, as shown in Table 3.6.

Table 3.5 Summary of LFG Measurement for April 2009						
Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH <sub>4</sub> ) %LEL	Carbon Dioxide (CO <sub>2</sub> ) %LEL	Oxygen (O <sub>2</sub> )
FMH 37	03 April 09	11:54	Overcast	0.00%	0.00%	20.9
FMH 35	03 April 09	12:00	Overcast	0.00%	0.00%	20.9
FMH 33 – 34	03 April 09	12:04	Overcast	0.00%	0.00%	20.9
FMH 33	03 April 09	12:09	Overcast	0.00%	0.00%	20.9



Table 3.5 Summary of LFG Measurement for April 2009

Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH <sub>4</sub> ) %LEL	Carbon Dioxide (CO <sub>2</sub> ) %LEL	Oxygen (O <sub>2</sub> )
S3	09 April 09	12:46	Sunny	0.00%	0.00%	20.7
FMH 37	09 April 09	12:36	Sunny	0.00%	0.00%	21.2
FMH 35	09 April 09	12:39	Sunny	0.00%	0.00%	21.1
FMH 33 – 34	09 April 09	12:41	Sunny	0.00%	0.00%	21.0
FMH 33	09 April 09	12:42	Sunny	0.00%	0.00%	21.0
S3	17 April 09	12:46	Sunny	0.00%	0.00%	20.1
FMH 37	17 April 09	12:21	Sunny	0.00%	0.00%	21.0
FMH 35	17 April 09	12:25	Sunny	0.00%	0.00%	20.7
FMH 33 – 34	17 April 09	12:29	Sunny	0.00%	0.00%	20.5
FMH 33	17 April 09	12:32	Sunny	0.00%	0.00%	20.4
S3	24 April 09	10:34	Overcast	0.00%	0.00%	20.6
FMH 37	24 April 09	10:16	Overcast	0.00%	0.00%	20.9
FMH 35	24 April 09	10:22	Overcast	0.00%	0.00%	20.8
FMH 33 – 34	24 April 09	10:26	Overcast	0.00%	0.00%	20.8
FMH 33	24 April 09	10:29	Overcast	0.00%	0.00%	20.7
S3	30 April 09	10:51	Sunny	0.00%	0.00%	20.6
FMH 37	30 April 09	10:34	Sunny	0.00%	0.00%	21.0
FMH 35	30 April 09	10:38	Sunny	0.00%	0.00%	20.8
FMH 33 – 34	30 April 09	10:41	Sunny	0.00%	0.00%	21.0
FMH 33	30 April 09	10:44	Sunny	0.00%	0.00%	20.9

## Remarks:

- 1) Landfill gas measurements, including oxygen level, were carried out with the repaired equipment (GEM 2000) since 09 April 2009.

Table 3.6 Action Levels, Limit Levels and Event and Action Plan for LFG (From EM&amp;A Manual)

Parameter	Level	Action
Oxygen	Action Level < 19% O <sub>2</sub>	Ventilate trench/ void to restore O <sub>2</sub> to >19%
	Limit Level < 18% O <sub>2</sub>	Stop works
		Evacuate personnel/prohibit entry Increase ventilation to restore O <sub>2</sub> to > 19%



Table 3.5 Summary of LFG Measurement for April 2009						
Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH <sub>4</sub> ) %LEL	Carbon Dioxide (CO <sub>2</sub> ) %LEL	Oxygen (O <sub>2</sub> )
Methane (CH <sub>4</sub> )	Action Level	>10% LEL	Post “No Smoking” signs Prohibit hot works Increase ventilation to restore CH <sub>4</sub> to <10% LEL			
	Limit Level	>20% LEL	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore CH <sub>4</sub> to <10% LEL			
Carbon Dioxide (CO <sub>2</sub> )	Action Level	>0.5% CO <sub>2</sub>	Ventilate to restore CO <sub>2</sub> to < 0.5%			
	Limit Level	>1.5% CO <sub>2</sub>	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore CO <sub>2</sub> to < 0.5%			



#### 4. SUMMARY OF ENVIRONMENTAL PERMIT AND LICENCES

ET has checked with the Contractor for the status of all environmental permits and licenses for this project as at April 2009, which is summarized in Table 4.1. ET will follow the application process of the outstanding permits / licenses and will provide suitable assistance whenever appropriate.

Table 4.1 Summary of Environmental Permits/ Licences				
Description	License / Permit No.#	Date of Issue	Date of Expiry	Status/Remarks
Environmental Permit	EP-226/2005	9-Sept-2005	--	Issued
Registration of Waste Producer	5111-421-K2869-02	27-Jul-2006	--	Issued
Construction Noise Permit	GW-RW0402-07	07-Aug-2007	28-Feb-2008	Expired
Effluent Discharge Licence	EP760/421/011762/I	20-Nov-2006	1-Dec-2011	Issued

#### 5. CUMULATIVE LOG OF COMPLAINTS AND REMEDIAL ACTION

The cumulative log of complaints is referred in Appendix 5.

#### 6. CUMULATIVE LOG OF NOTIFICATION OF SUMMONS AND PROSECUTIONS

No notification of summons and no prosecutions occurred during April 2009.

#### 7. CONCLUSION

There is no summon nor prosecutions reported during April 2009.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to investigate and monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by contractor, no further action has been taken by EPD in regard to the above incident.



Several environmental issues, such as improper accommodation of chemical drums, inadequate dust suppression measures and incompleteness of hoardings re-installation along Phase I and II construction site, have been identified by ET during weekly site inspections in the reporting month. Contractor has implemented some mitigation measures to address those problems as advised by ET. Some of the measures taken by the contractor were considered as effective to minimize negative impact to the environment. On-going investigation will be carried out to observe performance and effectiveness of those measures. Outstanding environmental items will be inspected in the following month.

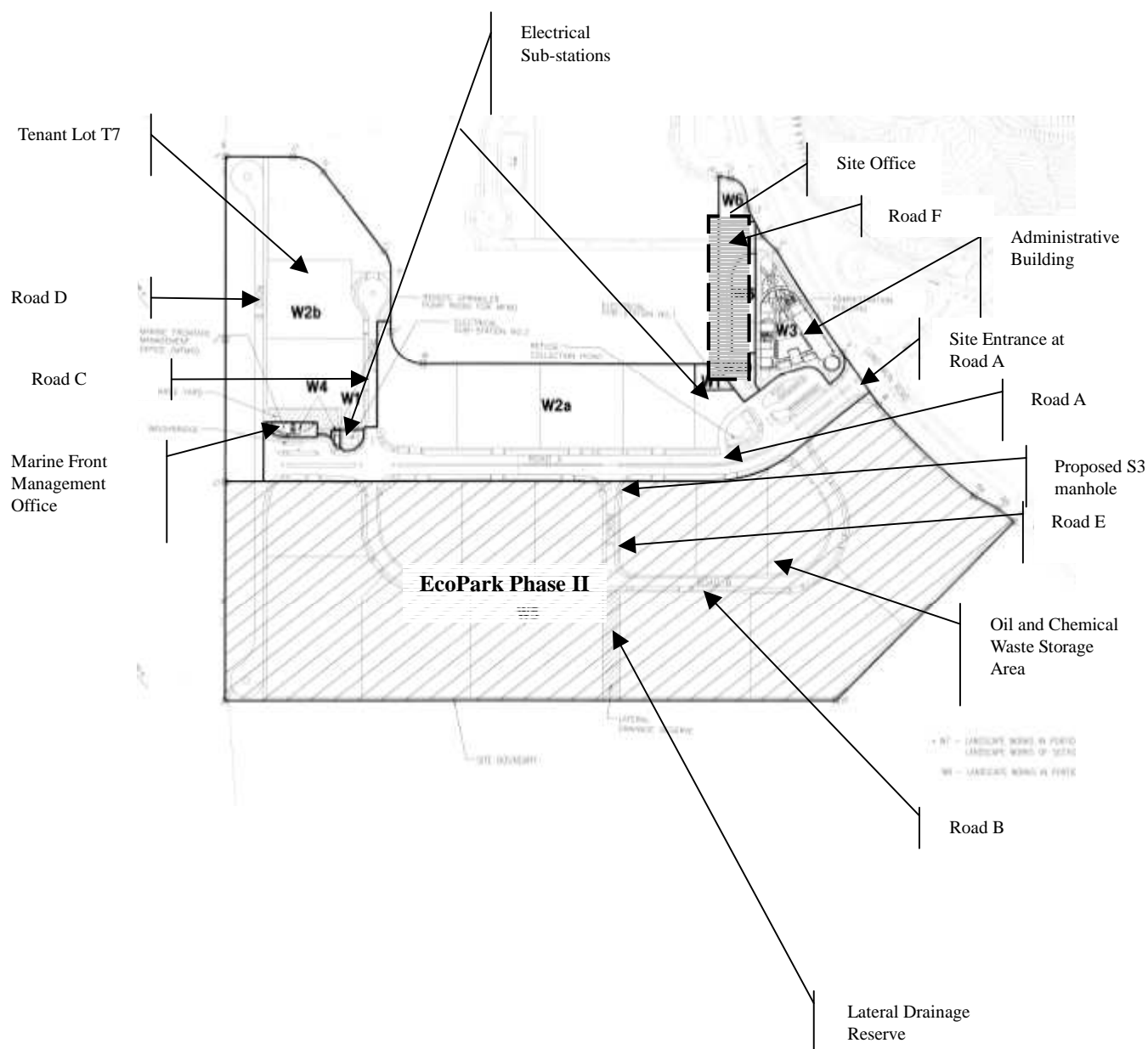
The Contractor has been using the waste management and record system including allocation of waste storage areas and the trip ticket system as proposed in the Environmental Management Plan.

LFG monitoring was carried out in April 2009 on weekly basis. The measurement results from ET shown in Table 3.5 were within Action and Limit Levels in accordance with EM&A manual.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.



## APPENDIX 1 - SITE LAYOUT PLAN





**APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF ECOPARK IN TUEN MUN AREA 38**

<b>Company/Department</b>	<b>Name</b>	<b>Position</b>	<b>Telephone</b>
Scott Wilson Ltd.	Harold Insley	Independent Environmental Checker	2410 3858
Scott Wilson Ltd.	Mr. Andy Cheung	Resident Engineer	6111 9703
Scott Wilson Ltd.	Mr. T W Wong	Inspector	6111 9705
Kaden Construction Limited	Mr. K M Book	Project Manager	9193 8680
Kaden Construction Limited	Mr. Stephen Leung	Section Agent	9071 7657
Environmental Pioneers & Solutions Limited	Miss. Patricia Chung	Environmental Team Leader	2185 0123
Environmental Pioneers & Solutions Limited	Mr. William Wong	Environmental Technician	2185 0154
Environmental Pioneers & Solutions Limited	Mr. Stephen Tsang	Environmental Technician	2185 0172

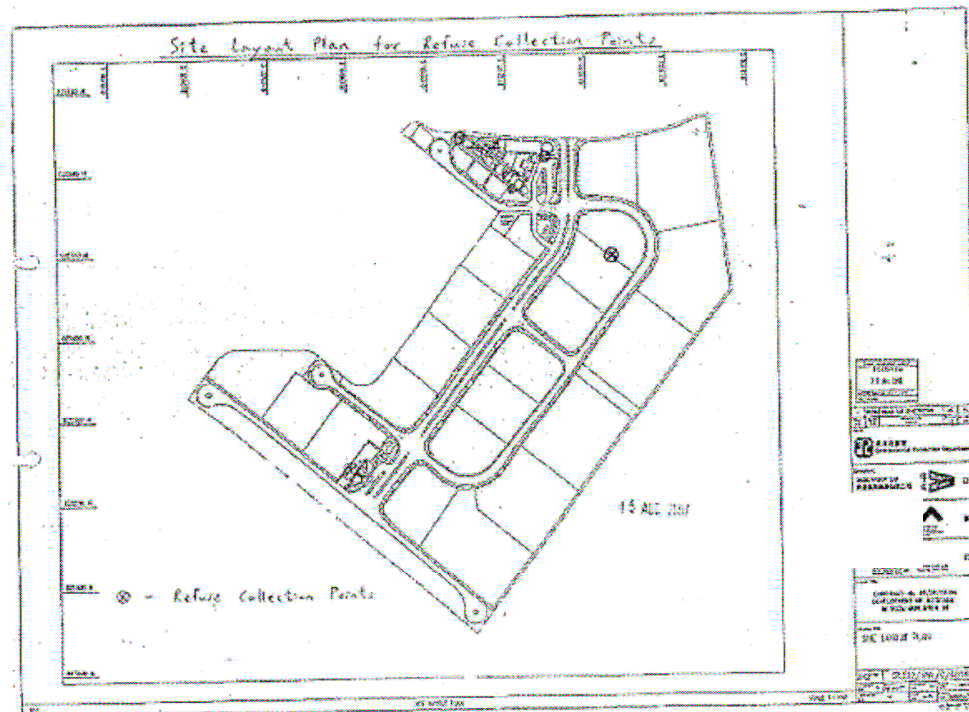


### APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS

Development of EcoPark in Tuen Mun Area 38

Contract No. EP/SP/52/06  
EM&A Report No. 30 (December 2008)

#### APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS





**APPENDIX 4 - ORIGINAL LANDFILL GAS FIELD MEASUREMENT  
RECORDING SHEETS**

Environmental Pioneers and Solutions Limited

Contract No.: EP/SP/52/06 - Development of EcoPark in Tuen Mun Area 38

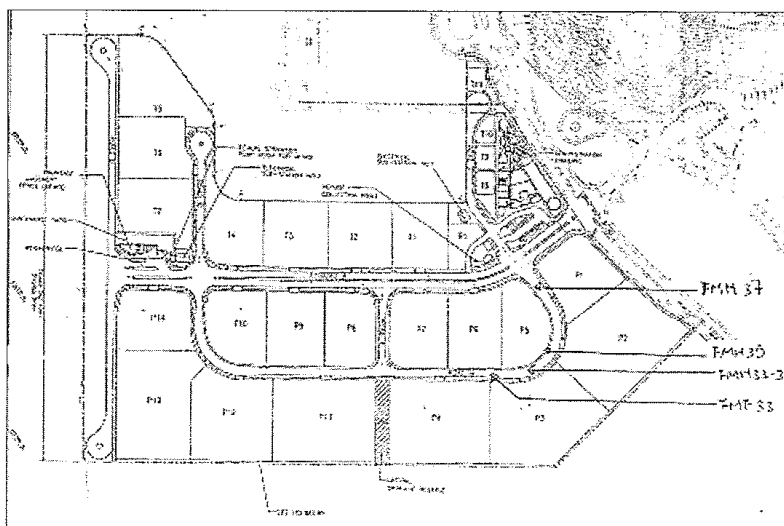
**Landfill Gas Monitoring – Field Measurement Recording Sheet**

Date of Monitoring: 3/4/2009  
 Weather condition: cloudy overcast  
 Monitoring performed by: Chung Pui Suen  
 Monitoring instrument:

Instruments	Model: GEM 2000 Plus	Last calibration:	18 Dec 2008
	S/N: GM-08793	Next calibration:	17 Dec 2009

Monitoring results:

Location	Time	Results				
		Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Bal. Gas %	Baro. Pressure %
FMH 33	1209	00.0	00.0	20.9	84.9	31.87
FMH 33 – 34	1204	00.0	00.0	20.9	84.6	31.87
FMH 35	1200	00.0	00.0	20.9	84.5	31.87
FMH 37	1154	00.0	00.0	20.9	84.4	31.87

Instrument for O<sub>2</sub> measurement: GasAlert MicroClip GAMIC-4-DL2 Serial no.: S103-13348



Environmental Pioneers and Solutions Limited

Contract No.: EP/SP/52/06 - Development of EcoPark in Tuen Mun Area 38

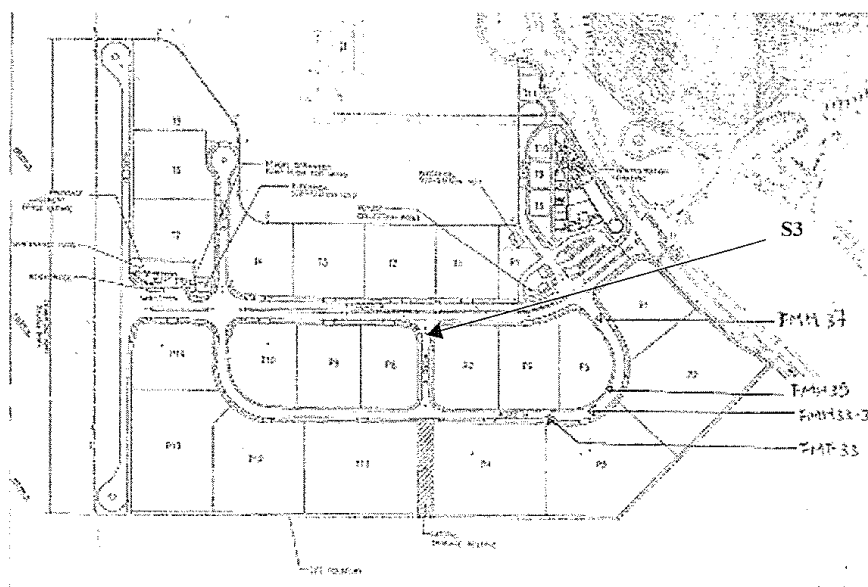
**Landfill Gas Monitoring – Field Measurement Recording Sheet**Date of Monitoring: 09 April 09Weather condition: SunnyMonitoring performed by: William Wong

Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Bal. Gas %	Baro. Pressure %
S3	12:46	0.00	0.00	20.7	79.2	29.99
FMH 33	12:42	0.00	0.00	21.0	78.9	29.99
FMH 33 - 34	12:41	0.00	0.00	21.0	78.9	29.99
FMH 35	12:39	0.00	0.00	21.1	78.7	29.99
FMH 37	12:36	0.00	0.00	21.2	78.7	29.99





Environmental Pioneers and Solutions Limited

Contract No.: EP/SP/52/06 - Development of EcoPark in Tuen Mun Area 38

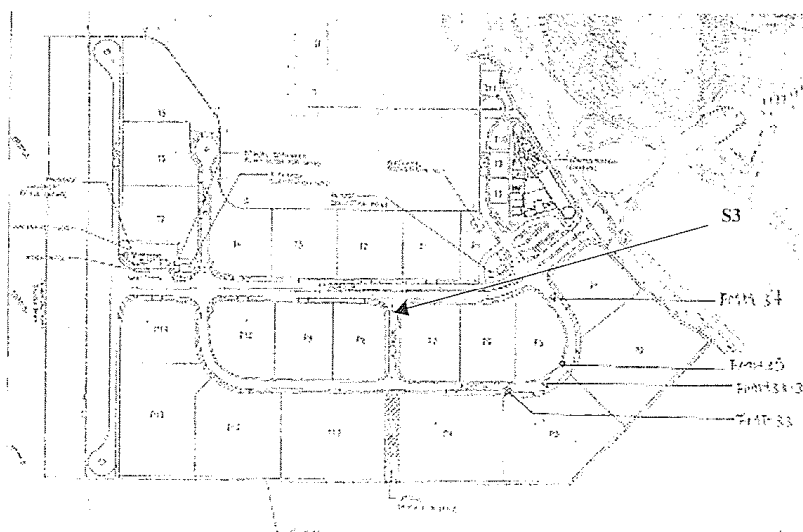
**Landfill Gas Monitoring – Field Measurement Recording Sheet**

Date of Monitoring: 17 April 2009  
 Weather condition: Sunny  
 Monitoring performed by: Chung Pat Suen  
 Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Bal. Gas %	Baro. Pressure %
S3	1246	00.0	00.0	20.1	79.7	29.70
FMH 33	1232	00.0	00.0	20.4	78.3	29.70
FMH 33 – 34	1229	00.0	00.0	20.5	78.8	29.70
FMH 35	1225	00.0	00.0	20.7	79.0	29.70
FMH 37	1221	00.0	00.0	21.0	78.9	29.70





Environmental Pioneers and Solutions Limited

Contract No.: EP/SP/52/06 - Development of EcoPark in Tuen Mun Area 38

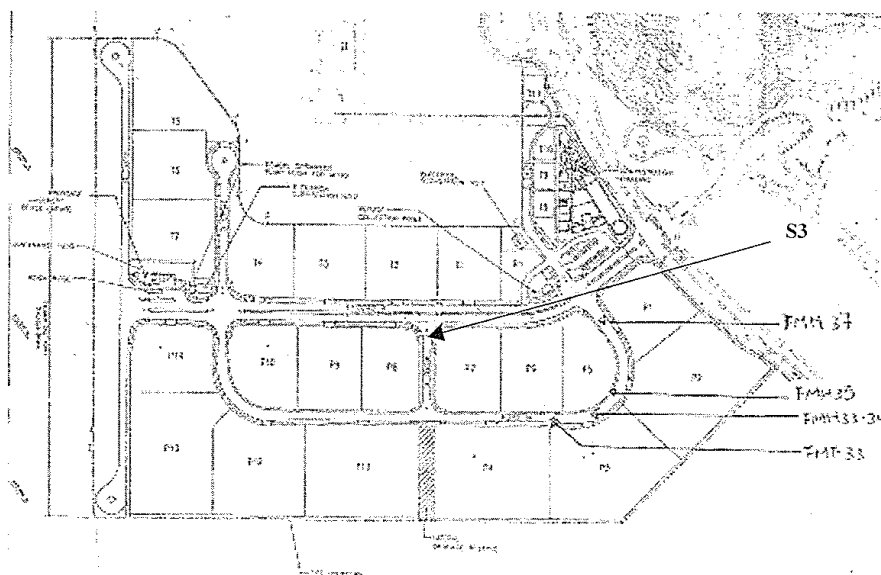
**Landfill Gas Monitoring – Field Measurement Recording Sheet**

Date of Monitoring: 24/4/2009  
 Weather condition: Overcast  
 Monitoring performed by: Chung Pui Suen  
 Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Bal. Gas %	Baro. Pressure %
S3	1034	00.0	00.0	20.6	79.3	29.75
FMH 33	1029	00.0	00.0	20.7	79.2	29.75
FMH 33 – 34	1026	00.0	00.0	20.8	79.1	29.75
FMH 35	1022	00.0	00.0	20.8	79.1	29.75
FMH 37	1016	00.0	00.0	20.9	78.9	29.75





Environmental Pioneers and Solutions Limited

Contract No.: EP/SP/52/06 - Development of EcoPark in Tuen Mun Area 38

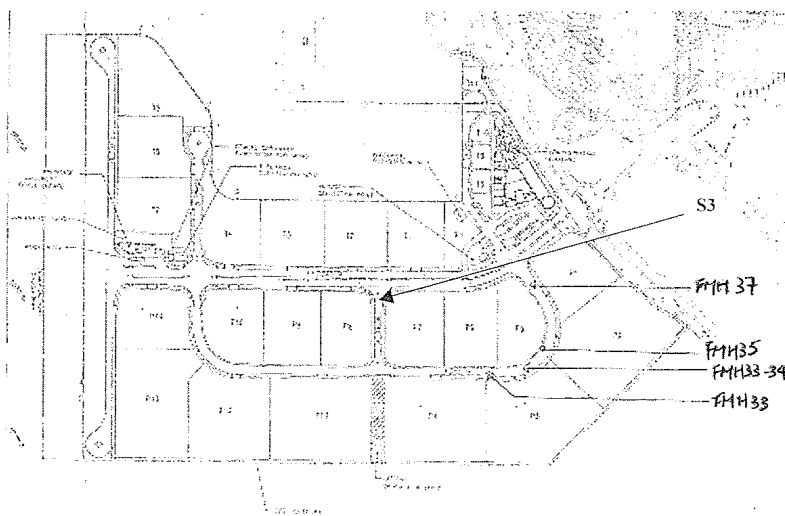
**Landfill Gas Monitoring – Field Measurement Recording Sheet**

Date of Monitoring: 30/4/2009  
 Weather condition: Sunny  
 Monitoring performed by: Chung Pui Suen  
 Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Bal. Gas %	Baro. Pressure %
S3	1051	00.0	00.0	20.6	79.3	29.94
FMH 33	1044	00.0	00.0	20.9	79.0	29.94
FMH 33 – 34	1046	00.0	00.0	21.0	78.9	29.94
FMH 35	1038	00.0	00.0	20.8	79.1	29.94
FMH 37	1034	00.0	00.0	21.0	78.9	29.94





**APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS****CUMULATIVE LOG OF COMPLAINTS**

<b>Environmental Parameters</b>	<b>No. of Outstanding Complaints</b>	<b>No. of complaints received in April 2009</b>	<b>Cumulative no. of complaints received since the commencement of project</b>
Air	0	0	2
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	2

**DETAILS OF COMPLAINTS AND REMEDIAL ACTIONS**

<b>Log Ref.</b>	<b>Date of Complaint received</b>	<b>Location</b>	<b>Complainant /Date</b>	<b>Details of Complaint</b>	<b>Investigation /Mitigation Action</b>	<b>Investigated by/ Date</b>
-	-	-	-	-	-	-



**APPENDIX 6 – Calibration Certificates for GEM 2000**

Hong Kong Calibration Ltd.  
香港校正有限公司

**Calibration Certificate**Certificate No. **91563**Page **1** of **2** Pages**Customer :** Kaden**Address :** 屯門38區環保園**Order No. :** Q90664**Date of receipt :** 3-Apr-09**Item Tested****Description :** Gas Analyzer**Manufacturer :** CES-LANDTEC**Model :** GEM 2000**Serial No. :** GM08793106**Test Conditions****Date of Test :** 7-Mar-09**Supply Voltage :** --**Ambient Temperature :** (23 ± 3)°C**Relative Humidity :** (50 ± 25) %**Test Specifications**

Calibration check.

Ref. Document/Procedure : V06, Manufacturer recommended method.

**Test Results**

All results were within the manufacturer's specification.

The results are shown in the attached page(s).


Main Test equipment used:

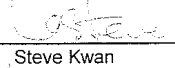
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S138J	Volumetric Syringe	64104	8-Sep-09	NIM-PRC
S138G	Volumetric Syringe	64101	8-Sep-09	NIM-PRC
S158L	Std. Gas	61388	29-Mar-10	NIST-USA
S158F(13)	Std. Gas	83395	3-May-09	NIST-USA
S158A(III)	Std. Gas	60217	28-Dec-09	NIST-USA

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Dorothy Cheuk

**Approved by :**   
Steve Kwan

Date: 8-Apr-09

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Tai Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

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香港校正有限公司

## Calibration Certificate

Certificate No. **91563**

Page 2 of 2 Pages

Results :

1. **Appearance Check : Pass**
2. **Gas Sampling Tube Leak Check : Pass**
3. **Internal Pump Check : Pass**
4. **Gas Response**

Applied Gas			UUT Reading (After adjust.)		Mfr's Spec.
CH <sub>4</sub>	0.00	% Vol.	0.0	% Vol.	± 0.3 % Vol.
	0.50	% Vol.	0.4	% Vol.	
	2.50	% Vol.	2.4	% Vol.	
CO <sub>2</sub>	0.00	% Vol.	0.0	% Vol.	± 0.3 % Vol.
	0.50	% Vol.	0.4	% Vol.	
	4.85	% Vol.	4.8	% Vol.	
	14.37	% Vol.	14.1	% Vol.	± 1 % Vol.
O <sub>2</sub>	40.06	% Vol.	39.3	% Vol.	± 3 % Vol.
	0.00	% Vol.	0.0	% Vol.	± 1 % Vol.
	20.9	% Vol.	20.9	% Vol.	

5. **t90 Response Time Check : Pass**

Remarks : 1. UUT : Unit-Under-Test

2. Uncertainty : ± 0.5 % rdg., for a confidence probability of not less than 95%.
3. The UUT was repaired before the calibration. Fault found – there was a kink in one of the rubber tubing inside the UUT causing restricted flow of sample gas, resulting in under-reading of gas value.

----- END -----