

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU –
SHENZHEN – HONG KONG EXPRESS RAIL LINK
(No. EP-349/2009/G)

Remediation Report for
Mai Po Works Area (Site E)

Verified by:



Position:

Independent Environmental Checker

Date:

2 August 2012

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU -
SHENZHEN - HONG KONG EXPRESS RAIL LINK
(No. EP-349/2009/G)

Remediation Report for
Mai Po Works Area (Site E)

Certified by:



Position:

Environmental Team Leader

Date:

30 JUL 2012

Penta-Ocean Construction Co., Ltd

Remediation Report for Mai Po Ventilation Building Works Area (Site E) - XRL825

July 2012

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Penta-Ocean Construction Co., Ltd

Remediation Report for Mai Po Ventilation Building Works Area (Site E) - XRL825

July 2012

Reference 0119286

For and on behalf of
ERM-Hong Kong, Limited

Approved by: Frank Wan

Signed:



Position: Partner

Date: 20 July 2012

This report has been prepared by ERM-Hong Kong, Limited with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

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1.1 INTRODUCTION TO THE LAND CONTAMINATION ASSESSMENT OF XRL

The Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) is an express rail link connecting Hong Kong, Shenzhen and Guangzhou. The terminal of the XRL will be West Kowloon in Hong Kong and Shibi in Guangzhou, with Futian and Longhua in Shenzhen and Humen in Dongguan as intermediate stations. The Hong Kong section of the XRL project will comprise a 26 km long underground rail line on a dedicated track from the proposed West Kowloon terminus to the border at Huanggang, where it will connect with the XRL Mainland section.

The Project is a Designated Project under the *Environmental Impact Assessment Ordinance (EIAO)*. An Environmental Impact Assessment (EIA) for the XRL Hong Kong section was conducted and approved under the EIAO on 28 September 2009 (Register No. AEIAR-143/2009).

During the EIA stage, a Land Contamination Assessment (LCA) was conducted to assess the presence and extent of land contamination associated with the historical and current operations along the proposed alignment. A Contamination Assessment Plan, attached as Appendix 9.1 of the EIA Report, has been approved (hereinafter referred as 'Approved CAP'). Site Investigation (SI) were conducted at accessible potential contaminated sites during the EIA stage in accordance with the Approved CAP and a Contamination Assessment Report/Remediation Action Plan (hereinafter referred as 'Approved CAR/RAP'), attached as Appendix 9.2 of the EIA Report, has been endorsed by the EPD.

An Environmental Permit (EP-349/2009) for the Project was granted on 16 October 2009 and subsequently varied by the Director of Environmental Protection (DEP) with the latest Environmental Permit (EP349/2009/G) issued on 11 June 2012. In accordance with Condition 2.21 of the EP, the Permit Holder shall carry out further LCA in accordance with the EIA Report and Approved CAP. Further site appraisal and supplementary SI shall be carried out when individual site access is granted to ascertain contaminating sources and hotspots of contamination.

1.2 BACKGROUND TO THIS REMEDIATION REPORT

In accordance with the Approved CAP, a total of five parcels of land, namely Sites A, C (subsequently divided into Sites C1 and C2 due to different site resumption timelines), D, E and WSW, were identified within the Mai Po Ventilation Building Works Area (MPV). For the Sites A, C2 and E, the MTR Corporation Limited (MTRC) has commissioned Gammon Construction Limited to conduct the further LCA. A Revised CAP for these three Sites (hereinafter referred as 'Revised CAP (Part I)') and were approved by EPD in

March 2010. Supplementary SI was conducted during the period between October and November 2009. The SI results shown that soil was found contaminated at Site E and remediation work was needed. A Revised CAR/RAP for the Mai Po Ventilation Building Works Area (Revision C) for these three Sites – Sites A, C2 and E was approved by the EPD in April 2010 (hereinafter referred as ‘Revised CAR/RAP (Part I)’).

Penta-Ocean Construction Co. Ltd (POC) was awarded the contract for the construction of the Express Rail Link Contract 825 (XRL 825) for MPV section by MTRC. In April 2011, ERM-Hong Kong, Limited (ERM) was commissioned by POC to provide remediation services at Site E, including the preparation of a method statement, technical support of biopile construction, biopile progress monitoring, remediation closure assessment and this remediation report according to the EPD’s *Guidance Note for Contaminated Land Assessment and Remediation* (the Guidance Note) and the Revised CAR/RAP (Part I). POC was responsible for the construction and operation of the biopile.

1.3 *PURPOSE AND SCOPE*

The purpose of this remediation report is to demonstrate that the remediation work was conducted as per the requirements in the Revised CAR/RAP (Part I) and the remediation of contaminated soil has been completed on site that the contaminant level in the excavated soil is able to meet the corresponding RBRGs before further use of the soil.

1.4 *STRUCTURE OF THE REPORT*

This report is structured as follows:

- Section 2* Summary of the soil contamination identified at Site E of XRL825;
- Section 3* Summary of the contaminated soil excavation and closure assessment for excavation;
- Section 4* Summary of the biopile progress monitoring and biopile closure assessment; and
- Section 5* Conclusion of the remediation works.
- Annex A* Technical Note for Closure Assessment at Site E
- Annex B* Indicative Biopile Location and Sampling Location in Closure Assessments
- Annex C* Risk-Based Remediation Goals
- Annex D* Selected Site Photographs
- Annex E* Laboratory Testing Reports

2.1 SOIL CONTAMINATION IDENTIFIED

A total of 20 boreholes were constructed within the Sites A, C2 and E in accordance with the Revised CAP (Part I). Five of them were located within Site E. The supplementary SI was undertaken during the periods between October and November 2009 by Gammon Construction Limited. Among the five boreholes constructed in Site E, borehole E-02 was found with elevated level of Bis-(2-ethylhexyl)phthalate (DEHP) at the depth of 3.00-3.45 m below base of concrete (bbc). The corresponding result is summarized in the *Table 2.1*.

Table 2.1 *Summary of Soil Samples Exceeding RBRGs*

Sample ID	Depth (m bbc)	Contaminant	RBRGs for industrial land use (mg/kg)	Concentration Detected (mg/kg)	Exceedance of RBRGs (Y/N)
E-02	3.00-3.45	DEHP	91.8	134	Y

It was estimated that approximately 34m³ of soil at or near E-02 with DEHP concentration in excess 91.8 mg/kg would require remediation action to maintain the residual concentration of the contaminant within the RBRGs for industrial landuse.

2.2 SELECTED SOIL REMEDIATION METHOD

Considering the quantity of soil, the nature of the contaminant, the experience of application in Hong Kong and the options appraisal of selected remediation techniques in the Revised CAR/RAP (Part I), excavation followed by biopiling was identified as the most practical approach.

3.1 EXCAVATION OF CONTAMINATED SOIL AND CONFIRMATION SAMPLING

The excavation and sampling of contaminated soil was conducted in April 2010 by POC. According to the Technical Note dated 11 March 2011 provided by MTRC, as attached in *Annex A*, a zone of 5m X 5m square centred at E-02 was excavated to a depth of 4.5m. The excavation was carried out with the use of earth removing equipments and the support of manual labour in accordance with the requirements in the Revised CAR/RAP (Part I) and under the supervision of the land contamination specialist from ERM. This area was demarcated as an exclusion zone and fenced off to ensure that no construction work would be conducted before the removal of contaminated soil. The extent of area excavated was attached in *Annex A* (as part of the Technical Note, Drawing: NOL/ERL/300/C/ENS/M57/ 539 Rev.C,).

In order to delineate the extent of contamination in the area around E-02, a total of five confirmatory soil samples were taken with four of them from the sidewalls at a depth of 3.2m (E-02a to E-02d) and one at the bottom of the pit (E-02e) of the excavated area. Each sample was tested with DEHP. *Table 3.1* below summarises the details and results of the confirmatory sampling at E-02.

Table 3.1 *Summary of Confirmatory Sampling Result at E-02*

Sample ID	Sampling Location	Sample Depth (m)	DEHP Concentration (mg/kg)	Exceedance of RBRGs (Y/N)
E-02a	Side walls of the pit	3.2	BDL	N
E-02b		3.2	BDL	N
E-02c		3.2	BDL	N
E-02d		3.2	BDL	N
E-02e	Bottom of the pit	4.5	BDL	N

Note:
BDL – Below laboratory detection limit (i.e. 5mg/kg)

3.2 LABORATORY ANALYSIS

The analytical chemical analysis of confirmatory soil samples were conducted by ALS Technichem (HK) Pty Ltd (ALS). ALS conducted all analysis in accordance with the USEPA procedures and methods, including laboratory internal QA/QC procedures. The samples were analysed using the analytical method presented in *Table 3.2* below:

Table 3.2 *Methods of Analysis for Soil Samples*

Parameter	Referenced Analytical Method	Laboratory Reporting Limit
DEHP	USEPA 8270	5mg/kg

Laboratory testing of these confirmation samples indicated no DEHP exceedance of RBRGs for industrial landuse (ie below 91.8mg/kg). The RBRGs for soil and soil saturation limits are attached in *Annex C*. The laboratory reports are attached in *Annex A* (as part of the technical note). In addition, no visual indication of potential contamination in the contaminated zone was observed during excavation, the extent of contaminated area was therefore confirmed and no further excavation was required. The open excavation was then backfilled with clean soil after the completion of contaminated soil excavation.

During the excavation, materials such as concrete blocks, rocks, boulders and bricks, were separated from the contaminated soil, as far as practicable, to facilitate the remediation progress. Contaminated soil excavated were immediately stockpiled and covered up with a tarpaulin sheets to prevent dust emission and excessive water ingress. All the construction activities were carried out by persons with appropriate health and safety training and were equipped with personal protective equipment (including safety helmets, reflective vests and safety shoes) during the excavation. For personnel who involved in handling the contaminated soil, latex gloves was worn to minimize potential dermal contact with the soil. Smoking, drinking and eating was prohibited in the contaminated area.

After surveying, the total volume of soil stockpiled was confirmed to be 34 m³. Selected site photographs taken during the excavation is attached in *Annex D*.

4.1 *TRANSFER OF CONTAMINATED SOIL*

The total volume of contaminated soil was confirmed as 34 m³ after the removal of boulders and refuses (approximately equals to the amount of soil stockpiled). The contaminated soil was then transferred to a lined treatment area for homogenization of contaminant level so as to facilitate the control of bioremediation and optimize cleanup times, before further re-located to a tailor-made biopile structure.

The biopile was located within the XRL825 Site works area. *Annex B* shows the indicative location of the biopile structure.

4.2 *SOIL REMEDIATION METHODOLOGY – BIOPILING*

4.2.1 *Biopile Formation*

A biopile structure was created in a dimension of 7m x 4m (area) x1.5m (height) in a longitudinal direction in accordance with the method statement and the Revised CAR/RAP (Part I). The contaminated soil was placed onto a concrete paved biopile structure with the base area covered by impermeable sheeting to prevent contamination migration. The biopile pile was bunded to prevent migration of surface runoffs during wetting. The top of the biopile was covered by an impermeable tarpaulin sheeting to avoid dust emission to the atmosphere and to minimize the amount of water generated. The tarpaulin sheeting was anchored at the four corners of the bund. Adequate turning was applied during the biopile formation to ensure air circulation and to avoid compaction of the biopile.

The biopile formation was completed on 8 November 2011.

4.2.2 *Biopile Operation*

Upon the completion of the biopile formation, mechanical turning of the soil was carried out in weekly basis to maximize air circulation, homogenization of the contaminated soil and enhance aerobic conditions for microbial growth. The soil was also sprayed with water to enhance the natural attenuation process. Compaction of biopile was avoided. Water was added on weekly basis to maintain the soil moisture content of 10-20%.

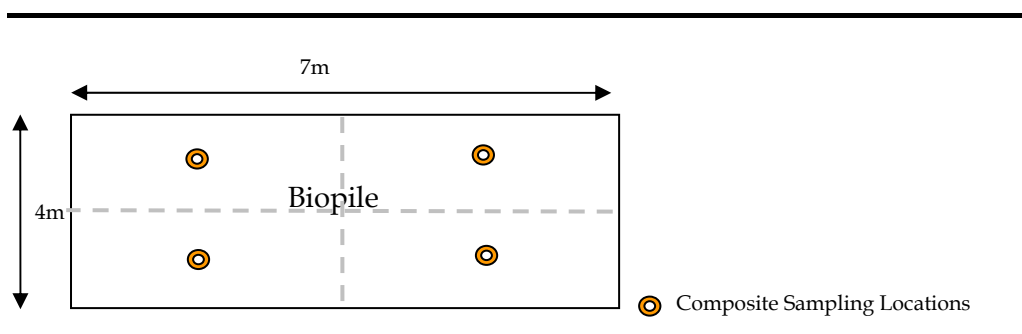
4.2.3 *Biopile Cleanup Progress Monitoring*

Soil samples were collected for DEHP analysis during biopiling to monitor the progress of cleanup in the soil. In accordance with the Revised CAR/RAP (Part I), soil samples shall be collected once every 3 months or higher frequency during the biopile operation depending on the actual remedial

progress. Once the cleanup targets are achieved, soil sampling may discontinue.

There were a total of three samples taken during the progress monitoring, with one of them taken in January 2012 (ie. at the third month after the biopile formation) while the other two of them taken in February and March 2012 (the fourth and fifth month after the biopile formation). The samples taken in the progress monitoring were composite samples with equal contribution of soil collected from four quadrates of the biopile. The indicative locations of each quadrate and composite soil sampling are as indicated in the figure below:

Figure 4.1 *Sampling Points for Biopile Progress Monitoring*



The soil sampling results were summarized in *Table 4.1* below.

Table 4.1 *Soil Sampling Results for Biopile Monitoring Progress Monitoring*

Month into Remediation Process	Date of Sampling	Testing Parameters	Number of Composite Sample(s)	Sample ID	DEHP Concentration (mg/kg)	Exceedance of RBRGs (Y/N)
First 3 months	10 January 2012	Moisture level and DEHP	1	XRL-825 0101	BDL	N
4 th	14 February 2012	Moisture level and DEHP	1	XRL-825 0201	BDL	N
5 th	14 March 2012	Moisture level and DEHP	1	XRL-825 0301	BDL	N
Note: BDL – Below Detection Limit (5mg/kg)						

The soil samples collected during the period between January and March 2012 showed that the DEHP level of the contaminated soil was below the corresponding RBRGs for industrial landuse, i.e. 91.8 mg/kg. The moisture levels of the soil were maintained at 20.3%, 18.2% and 22.1% respectively. Although the sample collected in January already showed a low level of DEHP (below laboratory detection limit), more soil samplings were carried out in February and March 2012 to ensure the cleanup target was met. Nevertheless, soil turning was continued before each sampling work. Such action could prevent uneven distribution of contaminant concentration and therefore created a more favourable biodegradation condition within the biopile.

As the DEHP level had reached the cleanup target for three consecutive samplings, according to the Revised CAR/RAP (Part I), such results indicated the accomplishment of biopile decontamination process and the commencement of the biopile closure assessment. Photographs taken during the remediation programme are shown in *Annex D*. Relevant laboratory analytical reports are attached in *Annex E*.

4.2.4 *Biopile Closure Assessment*

Biopile closure assessment was conducted in April 2012 to ensure the soil contaminant level of the soil was meeting the cleanup target. In accordance with the Revised CAR/RAP (Part I), one sample per 10m³ of soil volume should be taken from the biopile, ie., four individual samples for a total of 34m³ of soil. The locations of sampling are indicated in *Annex B*.

The soil sampling plan and results are summarized in *Table 4.2* below.

Table 4.2 *Soil Sampling Plan and Results for Biopile Closure Assessment*

Date of Sampling	Testing Parameters	Number of Sample(s)	Sample ID	Sample Location	DEHP Concentration (mg/kg)	Exceedance of RBRGs (Y/N)
10 April 2012	Moisture level and DEHP	4	XRL-825 0401 XRL-825 0402 XRL-825 0403 XRL-825 0404	Four samples at the four quadrants of the biopile	BDL	N
Note: BDL – Below Detection Limit (5mg/kg)						

The results indicated no DEHP exceedance of RBRGs for industrial landuse for all of the samples collected in the closure assessment. The cleanup target was regarded as achieved and the decontaminated soil shall be re-used within the XRL825 Site Area as filling material. Relevant laboratory analytical report was attached in *Annex E*.

4.2.5 *Sample Handling*

During the sampling for both the biopile progress monitoring and biopile closure assessment, clean latex gloves was worn and changed between each sampling. Each individual sample was placed into a laboratory supplied sample bottle which was laboratory cleaned, sealable, water-tight and made of glass or other suitable materials with aluminium to Teflon-lined lids, so that the container surface will not react with the sample or adsorb contaminants. No head space was allowed in the container. All sample containers were labelled with sampling ID, sampling location and sampling date with the use of a waterproof permanent marker. The samples were then transported under appropriate chain-of-custody documentation in clean coolers with ice packs, which maintained a temperature of 4°C. The samples were delivered to a HOKLAS certified analytical laboratory located in Hong Kong as soon as possible after collection.

The Chain of Custody for the samples was maintained from the time of sample collection to sample arrival at the testing laboratory. The written record of sample handling was intended to ensure prompt sample analysis and integrity.

The remediation work was carried out at Site E of the Contract XRL825 (Site E). The service included contaminated soil excavation, biopile formation, biopile progress monitoring, biopile closure assessment and preparation of this RR. The total volume of the contaminated soil stockpiled was 34m³. The contaminated soil was transferred to the biopile for a six-month remediation treatment. Soil samples were taken from the biopile for the analysis of DEHP content and moisture level.

The remediation programme commenced in November 2011. A total of three composite soil samples were taken during the biopile progress monitoring from January 2012 to March 2012. The DEHP levels of the soil samples were tested. No DEHP exceedances of RBRGs for industrial landuses were detected. The biopile closure assessment was then conducted to confirm the cleanup target has been met.

Four individual samples were taken during the closure assessment in April 2012. No DEHP exceedances of RBRGs for industrial landuses were detected. Remediation of the DEHP contaminated soil was regarded as completed. In accordance with the Revised CAR/RAP (Part I), the treated soil is suitable for further re-use within the XRL825 Site Area as filling material.

Annex A

Technical Note for Closure Assessment of Site E

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU –
SHENZHEN – HONG KONG EXPRESS RAIL LINK
(No. EP-349/2009/B)

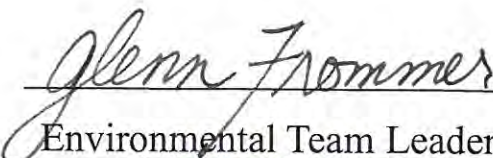
Technical Note for Closure Assessment at
Mai Po Ventilation Building Works Area
(Revision C)

Verified by: 
Position: Independent Environmental Checker
Date: 25 July 2011

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU –
SHENZHEN – HONG KONG EXPRESS RAIL LINK
(No. EP-349/2009/B)

Technical Note for Closure Assessment at
Mai Po Ventilation Building Works Area
(Revision C)

Certified by: 
Position: Environmental Team Leader
Date: 22 JUL 2011

**Technical Note for Closure Assessment for
Mai Po Ventilation Building Works Area (Site E)**

Background

Contaminated soil was identified in Site E of Mai Po Ventilation Building Works Area and remediation works is being conducted according to the approved Remediation Action Plan (RAP) which was approved by EPD. Excavation of the contaminated soil has been completed with confirmation by the closure assessment as recommended in the RAP. In accordance with Section 4.31 of the RAP, a technical note is prepared to summarize the findings in the closure assessment and to provide the relevant information for record.

Excavation of Contaminated Soil

Excavation of the contaminated soil was conducted in accordance with requirements in the approval RAP with the supervision of the land contamination specialist. The area of excavation was set according to the locations of the sidewall samples as mentioned below and the soil was excavated from depth 2.5m to 4.5m. No unusual condition (i.e. odour or discolouring) was noted on the soil and groundwater during the excavation. Photos showing the excavation process are provided in **Appendix A**.

Closure Assessment

A total of five samples were collected (four from sidewalls and one from pit base) to confirm the horizontal and vertical extent of the contaminated area. The locations of the sampling are shown in Figure 1 and the samples were then sent to the accredited laboratory for testing. The details of the sampling location and the results of the laboratory testing were shown below:

Confirmatory Sampling ID	Lab Sample ID	Location of Sample	Sampling Date	Sampling Depth (m BBC)	As Built Location		Confirmatory Testing Parameter	Testing Result
					Easting	Northing		
E-02a	250510E02A2	Sidewall	25/5/2010	3.2	824084	838897	Bis-(2-Ethylhexyl) Phthalate	< 5 mg/kg
E-02b	250510E02B2	Sidewall	25/5/2010	3.2	824081	838899		< 5 mg/kg
E-02c	250510E02C2	Sidewall	25/5/2010	3.2	824080	838896		< 5 mg/kg
E-02d	250510E02D2	Sidewall	25/5/2010	3.2	824083	838894		< 5 mg/kg
E-02e	4.5AreaE02	Pit Bottom	18/10/2010	3.95	Center of Pit			< 5 mg/kg

The relevant laboratory reports are attached in **Appendix B**. As indicated in the results, the level of Bis-(2-Ethylhexyl)Phthalate in the confirmatory samples are well below the RBRG criteria (industrial) of 91.8mg/kg and thus the contaminated soil was completely removed for subsequent remediation process.

Remediation by Biopiling

Approximately 34m³ of soil has been excavated for subsequent ex-situ remediation works within the Mai Po Works Area. The setup and operation of the biopile are according to the requirements in the RAP and upon completion of the remediation works, a Remediation Report (RR) will be submitted to EPD for approval.

APPENDIX A Site Photos

Photo 1 – Excavation Process



Photo 2 – Collection of Confirmatory Samples



APPENDIX B Results for Laboratory Testing



CERTIFICATE OF ANALYSIS

Client	: PENTA OCEAN CONSTRUCTION CO LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR MARKO CHAN	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1011147
Address	: UNIT 601, K. WAH CENTRE, 191 JAVA ROAD, NORTH POINT, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: wp.chan@pentaocan.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 25-MAY-2010
Order number	: ----			Issue Date	: 09-JUN-2010
C-O-C number	: H009061			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories

Anh Ngoc Huynh
Fung Lim Chee, Richard

Position

Senior Chemist
General Manager

Authorised results for

Organics
Inorganics



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client. The completion date of analysis is: 28-MAY-2010

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1011147**

Project Name: Confirmatory Sampling for E-02.

Site: Wo Shang Wai, Mai Po, Yuen Long.

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.



Analytical Results

Sub-Matrix: SOIL

Client sample ID

250510E02A2

Client sampling date / time

25-MAY-2010 13:30

Compound	CAS Number	LOR	Unit	HK1011147-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	21.9				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates								
Surrogate control limits listed at end of this report.								
2-Fluorophenol	367-12-4	0.1	%	60.4				
Phenol-d6	13127-88-3	0.1	%	49.7				
2,4,6-Tribromophenol	118-79-6	0.1	%	96.4				
EP-075T: Base/Neutral Extractable Surrogates								
Surrogate control limits listed at end of this report.								
Nitrobenzene -d5	4165-60-0	0.1	%	82.5				
2-Fluorobiphenyl	321-60-8	0.1	%	49.9				
4-Terphenyl-d14	1718-51-0	0.1	%	58.3				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1361648)								
HK1011144-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.2	17.7	8.8
HK1011154-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.1	17.6	3.1
EP-075C: Phthalate Esters (QC Lot: 1359224)								
HK1011030-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentration <i>n</i>	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 1359224)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	97.7	----	57	132	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: PENTA OCEAN CONSTRUCTION CO LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR MARKO CHAN	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1011151
Address	: UNIT 601, K. WAH CENTRE, 191 JAVA ROAD, NORTH POINT, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: wp.chan@pentaocan.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 25-MAY-2010
Order number	: ----			Issue Date	: 09-JUN-2010
C-O-C number	: H009061			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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Signatories

Anh Ngoc Huynh
Fung Lim Chee, Richard

Position

Senior Chemist
General Manager

Authorised results for

Organics
Inorganics



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client. The completion date of analysis is: 28-MAY-2010

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1011151**

Project Name: Confirmatory Sampling for E-02.

Site: Wo Shang Wai, Mai Po, Yuen Long.

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.



Analytical Results

Sub-Matrix: SOIL

Client sample ID

250510E02B2

Client sampling date / time

25-MAY-2010 14:00

Compound	CAS Number	LOR	Unit	HK1011151-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	22.2				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates								
Surrogate control limits listed at end of this report.								
2-Fluorophenol	367-12-4	0.1	%	67.0				
Phenol-d6	13127-88-3	0.1	%	52.3				
2,4,6-Tribromophenol	118-79-6	0.1	%	101				
EP-075T: Base/Neutral Extractable Surrogates								
Surrogate control limits listed at end of this report.								
Nitrobenzene -d5	4165-60-0	0.1	%	91.9				
2-Fluorobiphenyl	321-60-8	0.1	%	50.2				
4-Terphenyl-d14	1718-51-0	0.1	%	61.9				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1361648)								
HK1011144-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.2	17.7	8.8
HK1011154-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.1	17.6	3.1
EP-075C: Phthalate Esters (QC Lot: 1359224)								
HK1011030-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentratio n	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 1359224)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	97.7	----	57	132	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: PENTA OCEAN CONSTRUCTION CO LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR MARKO CHAN	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1011154
Address	: UNIT 601, K. WAH CENTRE, 191 JAVA ROAD, NORTH POINT, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: wp.chan@pentaocan.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 25-MAY-2010
Order number	: ----			Issue Date	: 09-JUN-2010
C-O-C number	: H009061			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
Anh Ngoc Huynh	Senior Chemist	Organics
Fung Lim Chee, Richard	General Manager	Inorganics



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client. The completion date of analysis is: 28-MAY-2010

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1011154**

Project Name: Confirmatory Sampling for E-02.

Site: Wo Shang Wai, Mai Po, Yuen Long.

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.



Analytical Results

Sub-Matrix: SOIL

Client sample ID

250510E02C2

Client sampling date / time

25-MAY-2010 14:30

Compound	CAS Number	LOR	Unit	HK1011154-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	17.1				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates								
Surrogate control limits listed at end of this report.								
2-Fluorophenol	367-12-4	0.1	%	70.9				
Phenol-d6	13127-88-3	0.1	%	54.8				
2,4,6-Tribromophenol	118-79-6	0.1	%	98.9				
EP-075T: Base/Neutral Extractable Surrogates								
Surrogate control limits listed at end of this report.								
Nitrobenzene -d5	4165-60-0	0.1	%	96.8				
2-Fluorobiphenyl	321-60-8	0.1	%	52.9				
4-Terphenyl-d14	1718-51-0	0.1	%	67.5				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1361648)								
HK1011144-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.2	17.7	8.8
HK1011154-001	250510E02C2	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.1	17.6	3.1
EP-075C: Phthalate Esters (QC Lot: 1359224)								
HK1011030-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentratio	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 1359224)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	97.7	----	57	132	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: PENTA OCEAN CONSTRUCTION CO LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR MARKO CHAN	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1011157
Address	: UNIT 601, K. WAH CENTRE, 191 JAVA ROAD, NORTH POINT, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: wp.chan@pentaocan.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 25-MAY-2010
Order number	: ----			Issue Date	: 09-JUN-2010
C-O-C number	: H009061			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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Signatories

Anh Ngoc Huynh
Fung Lim Chee, Richard

Position

Senior Chemist
General Manager

Authorised results for

Organics
Inorganics



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client. The completion date of analysis is: 28-MAY-2010

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1011157**

Project Name: Confirmatory Sampling for E-02.

Site: Wo Shang Wai, Mai Po, Yuen Long.

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.



Analytical Results

Sub-Matrix: SOIL

Client sample ID

250510E02D2

Client sampling date / time

25-MAY-2010 15:00

Compound	CAS Number	LOR	Unit	HK1011157-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	16.8				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates								
Surrogate control limits listed at end of this report.								
2-Fluorophenol	367-12-4	0.1	%	71.6				
Phenol-d6	13127-88-3	0.1	%	56.4				
2,4,6-Tribromophenol	118-79-6	0.1	%	95.2				
EP-075T: Base/Neutral Extractable Surrogates								
Surrogate control limits listed at end of this report.								
Nitrobenzene -d5	4165-60-0	0.1	%	97.2				
2-Fluorobiphenyl	321-60-8	0.1	%	56.8				
4-Terphenyl-d14	1718-51-0	0.1	%	69.1				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1361648)								
HK1011144-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.2	17.7	8.8
HK1011154-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.1	17.6	3.1
EP-075C: Phthalate Esters (QC Lot: 1360760)								
HK1011157-001	250510E02D2	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentratio <i>n</i>	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 1360760)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	61.6	----	57	132	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: PENTA OCEAN CONSTRUCTION CO LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR M H ISA	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1024759
Address	: UNIT 601, K. WAH CENTRE, 191 JAVA ROAD, NORTH POINT, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: isa@pentaocan.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2833 1098	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: XRL 825 MAI PO TO NGAU TAM MEI TUNNEL	Quote number	: ----	Date Samples Received	: 19-OCT-2010
Order number	: ----			Issue Date	: 29-OCT-2010
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 25-OCT-2010

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: HK1024759

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.
Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

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Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist	Organics
Fung Lim Chee, Richard	General Manager	Inorganics

ALS Laboratory Group
Trading Name: **ALS Technichem (HK) Pty Ltd**
11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong
Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com
A Campbell Brothers Limited Company

Appendix A – ALS Analysis Report

PENTA-OCEAN CONSTRUCTION CO., LTD.	
Contractor's Closure Assessment at Area E	Revision: 0
Express Rail Link	
Contract No. 825 – Mai Po To Ngau Tam Mei Tunnels	
	Page: 4 of 7
	 PENTA-OCEAN CONSTRUCTION CO., LTD. 五洋建設

Appendix A – ALS Analysis Report (Cont'd)



Page Number : 2 of 3
Client : PENTA OCEAN CONSTRUCTION CO LTD
Work Order : HK1024759

Analytical Results

Sub-Matrix: SOIL

				Client sample ID				
				Client sampling date / time				
				4.5 AREA E02				
				[18-OCT-2010]				
Compound	CAS Number	LOR	Unit	HK1024759-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	---	0.1	%	23.2				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	95.9				Surrogate control limits listed at end of this report.
Phenol-d6	13127-88-3	0.1	%	42.1				
2,4,6-Tribromophenol	118-79-6	0.1	%	58.6				
EP-075T: Base/Neutral Extractable Surrogates								
Nitrobenzene -d5	4165-60-0	0.1	%	71.2				Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	56.6				
4-Terphenyl-d14	1718-51-0	0.1	%	92.8				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1531783)								
HK1024747-004	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	11.9	12.3	2.7
HK1024772-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	21.7	22.4	2.8
EP-075C: Phthalate Esters (QC Lot: 1525361)								
HK1024364-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-075C: Phthalate Esters (QC Lot: 1525361)											
Bis(2-ethylhexyl)phthalate	117-81-7	5.0	mg/kg	<5	0.25 mg/kg	99.7	----	42	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

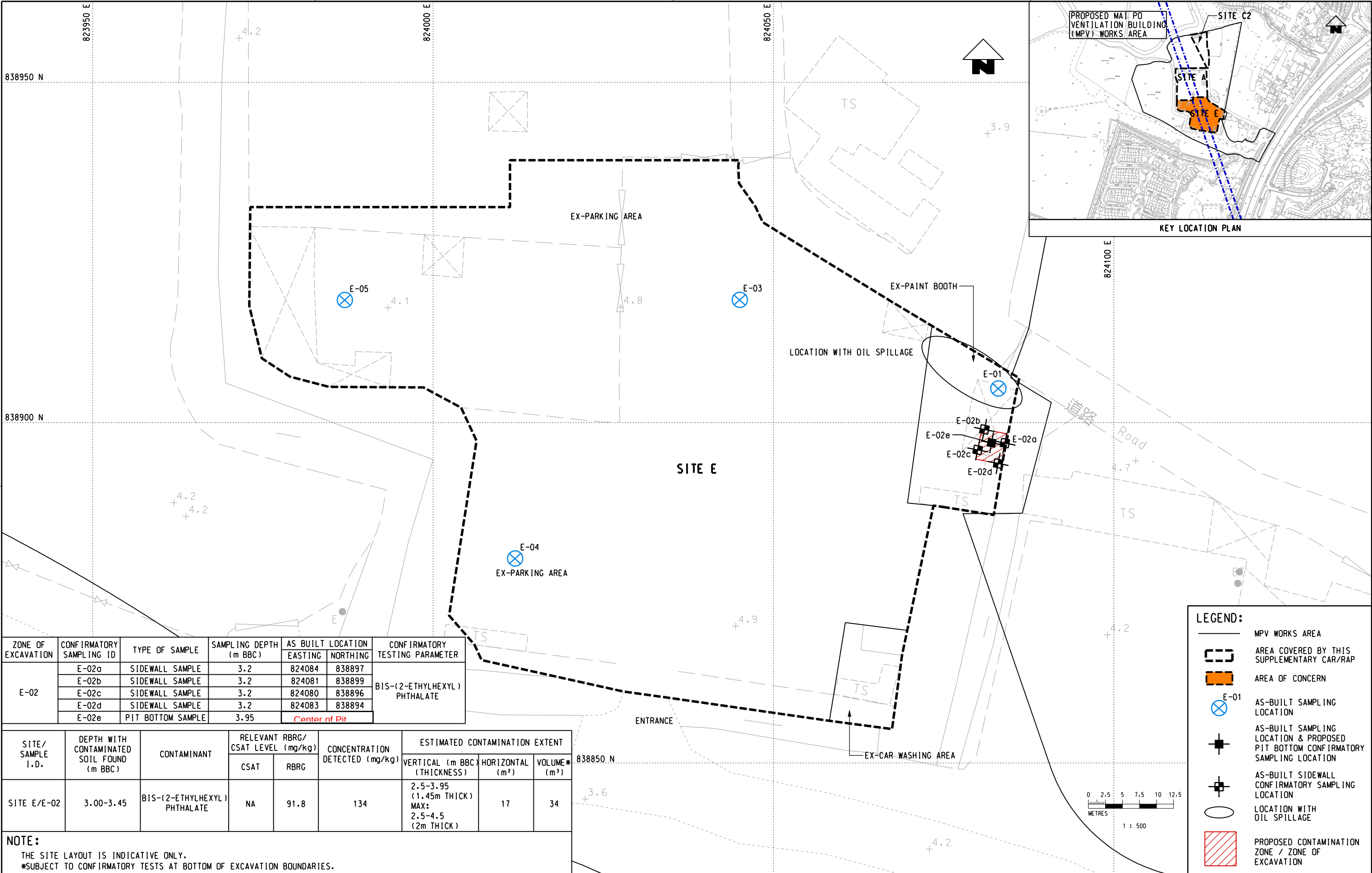
Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137

Appendix A – ALS Analysis Report (Cont'd)

PENTA-OCEAN CONSTRUCTION CO., LTD.	
Contractor's Closure Assessment at Area E	Revision: 0
Express Rail Link	
Contract No. 825 – Mai Po To Ngau Tam Mei Tunnels	
	Page: 6 of 7

Plot Drw: \\mtr\mtr\p1\driver\windows\3\color\p1\2010-7-28 9:57:41
Model Name: NOL/ERL/300/C/XRL/ENS/M57/539A.dgn
File Name: NOL/ERL/300/C/XRL/ENS/M57/539A.dgn



ZONE OF EXCAVATION	CONFIRMATORY SAMPLING ID	TYPE OF SAMPLE	SAMPLING DEPTH (m BBC)	AS BUILT LOCATION		CONFIRMATORY TESTING PARAMETER
				EASTING	NORTHING	
E-02	E-02a	SIDEWALL SAMPLE	3.2	824084	838897	BIS-(2-ETHYLHEXYL) PHTHALATE
	E-02b	SIDEWALL SAMPLE	3.2	824081	838899	
	E-02c	SIDEWALL SAMPLE	3.2	824080	838896	
	E-02d	SIDEWALL SAMPLE	3.2	824083	838894	
	E-02e	PIT BOTTOM SAMPLE	3.95	Center of Pit		

SITE/ SAMPLE I.D.	DEPTH WITH CONTAMINATED SOIL FOUND (m BBC)	CONTAMINANT	RELEVANT RBRG/ CSAT LEVEL (mg/kg)		CONCENTRATION DETECTED (mg/kg)	ESTIMATED CONTAMINATION EXTENT		
			CSAT	RBRG		VERTICAL (m BBC) (THICKNESS)	HORIZONTAL (m ²)	VOLUME* (m ³)
SITE E/E-02	3.00-3.45	BIS-(2-ETHYLHEXYL) PHTHALATE	NA	91.8	134	2.5-3.95 (1.45m THICK) MAX: 2.5-4.5 (2m THICK)	17	34

NOTE:
THE SITE LAYOUT IS INDICATIVE ONLY.
*SUBJECT TO CONFIRMATORY TESTS AT BOTTOM OF EXCAVATION BOUNDARIES.

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

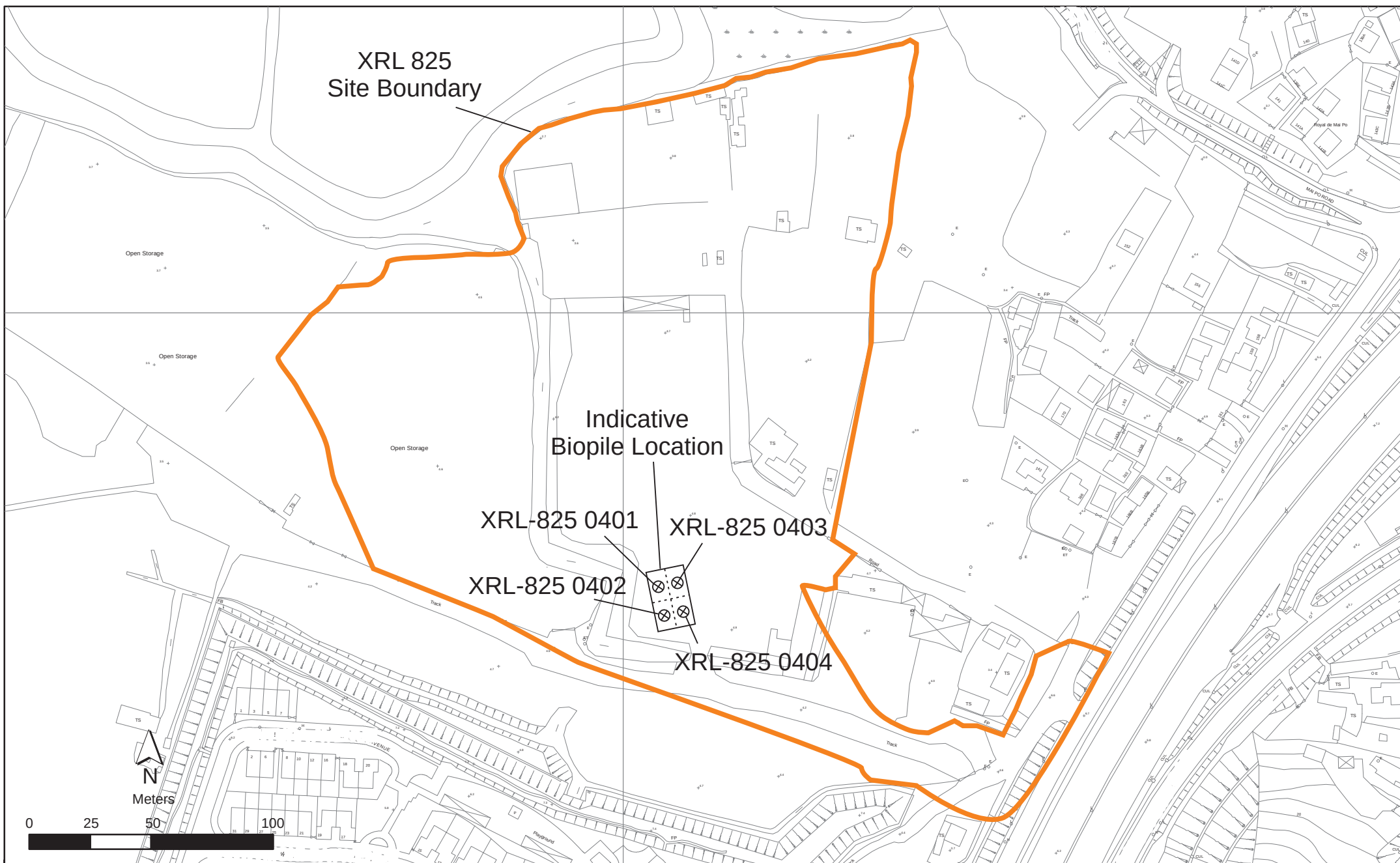
DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	13/JAN./2010
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CADD REF.	NOL/ERL/300/C/XRL/ENS/M57/539A.dgn

TITLE		
MTRC CONTRACT NO. 8202 SUPP. CAR/RAP (PART 1) FOR MPV WORKS AREA EXTENT OF CONTAMINATION AND CONFIRMATORY SAMPLING LOCATIONS		
SCALE	FIGURE NO.	REV.
1 : 500 (A3)	NOL/ERL/300/C/XRL/ENS/M57/539	A

Annex B

Indicative Biopile Location and Sampling Locations in Closure Assessment



Annex C

Risk-Based Remediation Goals

Table 2.1
Risk-Based Remediation Goals (RBRGs) for Soil & Soil Saturation Limit

Chemical	Risk-Based Remediation Goals for Soil				Soil Saturation Limit (C _{sat}) (mg/kg)
	Urban Residential (mg/kg)	Rural Residential (mg/kg)	Industrial (mg/kg)	Public Parks (mg/kg)	
VOCs					
Acetone	9.59E+03	4.26E+03	1.00E+04*	1.00E+04*	***
Benzene	7.04E-01	2.79E-01	9.21E+00	4.22E+01	3.36E+02
Bromodichloromethane	3.17E-01	1.29E-01	2.85E+00	1.34E+01	1.03E+03
2-Butanone	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	***
Chloroform	1.32E-01	5.29E-02	1.54E+00	2.53E+02	1.10E+03
Ethylbenzene	7.09E+02	2.98E+02	8.24E+03	1.00E+04*	1.38E+02
Methyl tert-Butyl Ether	6.88E+00	2.80E+00	7.01E+01	5.05E+02	2.38E+03
Methylene Chloride	1.30E+00	5.29E-01	1.39E+01	1.28E+02	9.21E+02
Styrene	3.22E+03	1.54E+03	1.00E+04*	1.00E+04*	4.97E+02
Tetrachloroethene	1.01E-01	4.44E-02	7.77E-01	1.84E+00	9.71E+01
Toluene	1.44E+03	7.05E+02	1.00E+04*	1.00E+04*	2.35E+02
Trichloroethene	5.23E-01	2.11E-01	5.68E+00	6.94E+01	4.88E+02
Xylenes (Total)	9.50E+01	3.68E+01	1.23E+03	1.00E+04*	1.50E+02
SVOCs					
Acenaphthene	3.51E+03	3.28E+03	1.00E+04*	1.00E+04*	6.02E+01
Acenaphthylene	2.34E+03	1.51E+03	1.00E+04*	1.00E+04*	1.98E+01
Anthracene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.56E+00
Benzo(a)anthracene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Benzo(a)pyrene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Benzo(b)fluoranthene	9.88E+00	1.01E+01	1.78E+01	2.04E+01	
Benzo(g,h,i)perylene	1.80E+03	1.71E+03	1.00E+04*	5.74E+03	
Benzo(k)fluoranthene	1.20E+02	1.14E+02	9.18E+02	3.83E+02	
bis-(2-Ethylhexyl)phthalate	3.00E+01	2.80E+01	9.18E+01	9.42E+01	
Chrysene	8.71E+02	9.19E+02	1.14E+03	1.54E+03	
Dibenzo(a,h)anthracene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Fluoranthene	2.40E+03	2.27E+03	1.00E+04*	7.62E+03	
Fluorene	2.38E+03	2.25E+03	1.00E+04*	7.45E+03	5.47E+01
Hexachlorobenzene	2.43E-01	2.20E-01	5.82E-01	7.13E-01	
Indeno(1,2,3-cd)pyrene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Naphthalene	1.82E+02	8.56E+01	4.53E+02	9.14E+02	1.25E+02
Phenanthrene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.80E+01
Phenol	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	7.26E+03
Pyrene	1.80E+03	1.71E+03	1.00E+04*	5.72E+03	
Metals					
Antimony	2.95E+01	2.91E+01	2.61E+02	9.79E+01	
Arsenic	2.21E+01	2.18E+01	1.96E+02	7.35E+01	
Barium	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Cadmium	7.38E+01	7.28E+01	6.53E+02	2.45E+02	
Chromium III	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Chromium VI	2.21E+02	2.18E+02	1.96E+03	7.35E+02	
Cobalt	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Copper	2.95E+03	2.91E+03	1.00E+04*	9.79E+03	
Lead	2.58E+02	2.55E+02	2.29E+03	8.57E+02	
Manganese	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Mercury	1.10E+01	6.52E+00	3.84E+01	4.56E+01	
Molybdenum	3.69E+02	3.64E+02	3.26E+03	1.22E+03	
Nickel	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Tin	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Zinc	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Dioxins / PCBs					
Dioxins (I-TEQ)	1.00E-03	1.00E-03	5.00E-03	1.00E-03	
PCBs	2.36E-01	2.26E-01	7.48E-01	7.56E-01	
Petroleum Carbon Ranges					
C6 - C8	1.41E+03	5.45E+02	1.00E+04*	1.00E+04*	1.00E+03
C9 - C16	2.24E+03	1.33E+03	1.00E+04*	1.00E+04*	3.00E+03
C17 - C35	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	5.00E+03
Other Inorganic Compounds					
Cyanide, free	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Organometallics					
TBTO	2.21E+01	2.18E+01	1.96E+02	7.35E+01	

Notes:

- (1) For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks", while the low end of the range of values for industrial, 5 ppb, has been applied to the scenario of "Industrial".
- (2) Soil saturation limits for petroleum carbon ranges taken from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil, CCME 2000.
- (3) * indicates a 'ceiling limit' concentration.
- (4) *** indicates that the C_{sat} value exceeds the 'ceiling limit' therefore the RBRG applies.

Table 2.2
Risk-Based Remediation Goals (RBRGs) for Groundwater and Solubility Limit

Chemical	Risk-Based Remediation Goals for Groundwater			Solubility Limit (mg/L)
	Urban Residential (mg/L)	Rural Residential (mg/L)	Industrial (mg/L)	
VOCs				
Acetone	1.00E+04*	1.00E+04*	1.00E+04*	***
Benzene	3.86E+00	1.49E+00	5.40E+01	1.75E+03
Bromodichloromethane	2.22E+00	8.71E-01	2.62E+01	6.74E+03
2-Butanone	1.00E+04*	1.00E+04*	1.00E+04*	***
Chloroform	9.56E-01	3.82E-01	1.13E+01	7.92E+03
Ethylbenzene	1.02E+03	3.91E+02	1.00E+04*	1.69E+02
Methyl tert-Butyl Ether	1.53E+02	6.11E+01	1.81E+03	***
Methylene Chloride	1.90E+01	7.59E+00	2.24E+02	***
Styrene	3.02E+03	1.16E+03	1.00E+04*	3.10E+02
Tetrachloroethene	2.50E-01	9.96E-02	2.95E+00	2.00E+02
Toluene	5.11E+03	1.97E+03	1.00E+04*	5.26E+02
Trichloroethene	1.21E+00	4.81E-01	1.42E+01	1.10E+03
Xylenes (Total)	1.12E+02	4.33E+01	1.57E+03	1.75E+02
SVOCs				
Acenaphthene	1.00E+04*	7.09E+03	1.00E+04*	4.24E+00
Acenaphthylene	1.41E+03	5.42E+02	1.00E+04*	3.93E+00
Anthracene	1.00E+04*	1.00E+04*	1.00E+04*	4.34E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene	5.39E-01	2.03E-01	7.53E+00	1.50E-03
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
bis-(2-Ethylhexyl)phthalate				
Chrysene	5.81E+01	2.19E+01	8.12E+02	1.60E-03
Dibenzo(a,h)anthracene				
Fluoranthene	1.00E+04*	1.00E+04*	1.00E+04*	2.06E-01
Fluorene	1.00E+04*	1.00E+04*	1.00E+04*	1.98E+00
Hexachlorobenzene	5.89E-02	2.34E-02	6.95E-01	6.20E+00
Indeno(1,2,3-cd)pyrene				
Naphthalene	6.17E+01	2.37E+01	8.62E+02	3.10E+01
Phenanthrene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+00
Phenol				
Pyrene	1.00E+04*	1.00E+04*	1.00E+04*	1.35E-01
Metals				
Antimony				
Arsenic				
Barium				
Cadmium				
Chromium III				
Chromium VI				
Cobalt				
Copper				
Lead				
Manganese				
Mercury	4.86E-01	1.84E-01	6.79E+00	
Molybdenum				
Nickel				
Tin				
Zinc				
Dioxins / PCBs				
Dioxins (I-TEQ)				
PCBs	4.33E-01	1.71E-01	5.11E+00	3.10E-02
Petroleum Carbon Ranges				
C6 - C8	8.22E+01	3.17E+01	1.15E+03	5.23E+00
C9 - C16	7.14E+02	2.76E+02	9.98E+03	2.80E+00
C17 - C35	1.28E+01	4.93E+00	1.78E+02	2.80E+00
Other Inorganic Compounds				
Cyanide, free				
Organometallics				
TBTO				

Notes:

- (1) Blank indicates that RBRG could not be calculated because the toxicity or physical/chemical values were unavailable, or the condition of Henry's Law Constant > 1.00E-05 was not met for the inhalation pathway.
- (2) Water solubilities for Petroleum Carbon Range aliphatic C9-C16 and greater than C16 generally are considered to be effectively zero and therefore the aromatic solubility for C9-C16 is used.
- (3) * indicates a 'ceiling limit' concentration.
- (4) *** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Annex D

Selected Site Photographs



Photo 1: Excavation Work with the use of mechanical machinery at E02



Photo 2: A demarcated no-work area fenced off from the rest of the site.

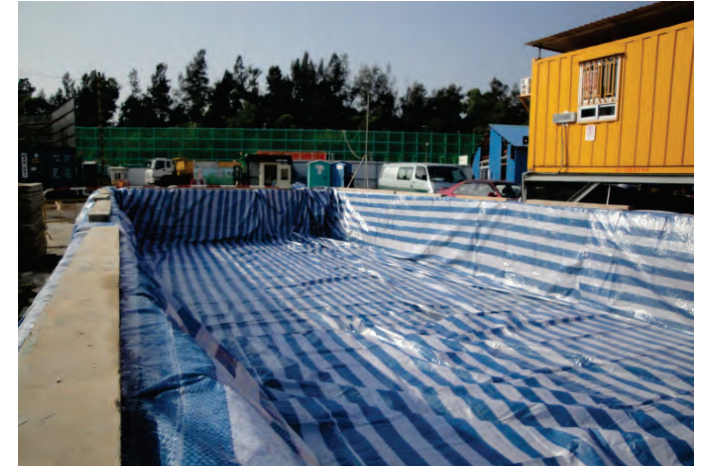


Photo 3: Confirmation of excavation depth.

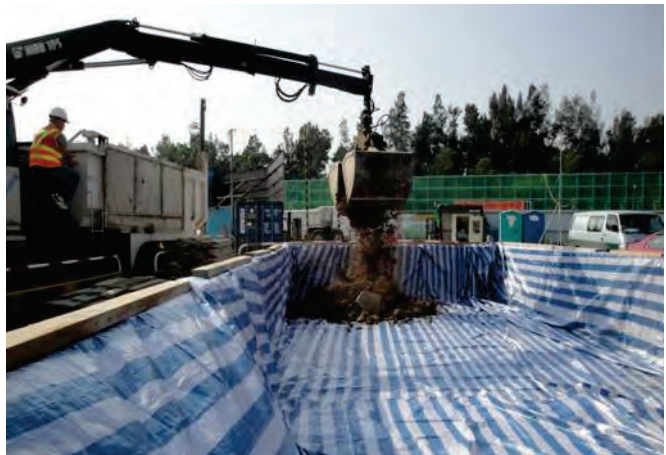


Photo 4: Transfer of excavated soil into the biopile structure covered by impermeable sheeting.



Photo 5: Soil turning with water spray to maintain moisture level of the soil.



Photo 6: Soil Sampling during monthly remediation progress monitoring.

Annex E

Laboratory Testing Reports



CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR STEPHEN LAM	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1200828
Address	: 21/F, LINCOLN HOUSE, 979 KING'S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Stephen.lam@erm.com	E-mail	: Godfrey.Chan@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 10-JAN-2012
Order number	: ----			Issue Date	: 31-JAN-2012
C-O-C number	: H008525			No. of samples received	: 1
Site	: XRL825			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 17-JAN-2012

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1200828**

Sample(s) were received in an ambient condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

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Signatories

Position

Authorised results for

Anh Ngoc Huynh
Fung Lim Chee, Richard

Senior Chemist
General Manager

Organics
Inorganics



Analytical Results

Sub-Matrix: SOIL				Client sample ID	XRL825-0101				
				Client sampling date / time	[10-JAN-2012]				
Compound	CAS Number	LOR	Unit		HK1200828-001				
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		20.3				
EP-075C: Phthalate Esters									
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg		<5				
EP-075S: Acid Extractable Surrogates								Surrogate control limits listed at end of this report.	
2-Fluorophenol	367-12-4	0.1	%		91.9				
Phenol-d6	13127-88-3	0.1	%		70.2				
2,4,6-Tribromophenol	118-79-6	0.1	%		58.6				
EP-075T: Base/Neutral Extractable Surrogates								Surrogate control limits listed at end of this report.	
Nitrobenzene -d5	4165-60-0	0.1	%		65.7				
2-Fluorobiphenyl	321-60-8	0.1	%		67.1				
4-Terphenyl-d14	1718-51-0	0.1	%		35.6				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2125266)								
HK1200955-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	50.1	50.7	1.1
HK1200964-005	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	43.5	40.8	6.4
EP-075C: Phthalate Esters (QC Lot: 2125963)								
HK1201076-014	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 2125963)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	103	----	75	113	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR ANGUS CHOI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1204342
Address	: 21/F, LINCOLN HOUSE, 979 KING'S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: angus.choi@erm.com	E-mail	: Godfrey.Chan@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 14-FEB-2012
Order number	: ----			Issue Date	: 22-FEB-2012
C-O-C number	: H008533			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 17-FEB-2012

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1204342**

Sample(s) were received in an ambient condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

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Signatories

Position

Authorised results for

Anh Ngoc Huynh
Fung Lim Chee, Richard

Senior Chemist
General Manager

Organics
Inorganics



Analytical Results

Sub-Matrix: SOIL

Client sample ID

XRL825-0201

Client sampling date / time

[14-FEB-2012]

Compound	CAS Number	LOR	Unit	HK1204342-001				
----------	------------	-----	------	---------------	--	--	--	--

EA/ED: Physical and Aggregate Properties

EA055: Moisture Content (dried @ 103°C)	----	0.1	%	18.2				
---	------	-----	---	------	--	--	--	--

EP-075C: Phthalate Esters

Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
----------------------------	----------	---	-------	----	--	--	--	--

EP-075S: Acid Extractable Surrogates

Surrogate control limits listed at end of this report.

2-Fluorophenol	367-12-4	0.1	%	80.4				
Phenol-d6	13127-88-3	0.1	%	78.3				
2,4,6-Tribromophenol	118-79-6	0.1	%	101				

EP-075T: Base/Neutral Extractable Surrogates

Surrogate control limits listed at end of this report.

Nitrobenzene -d5	4165-60-0	0.1	%	87.3				
2-Fluorobiphenyl	321-60-8	0.1	%	91.6				
4-Terphenyl-d14	1718-51-0	0.1	%	104				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2170328)								
HK1204306-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	23.0	22.7	1.4
EP-075C: Phthalate Esters (QC Lot: 2165533)								
HK1203990-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	28	28	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 2165533)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	81.4	----	75	113	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR ANGUS CHOI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1207061
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E-mail	: angus.choi@erm.com	E-mail	: Godfrey.Chan@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 14-MAR-2012
Order number	: ----			Issue Date	: 23-MAR-2012
C-O-C number	: H028075			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 19-MAR-2012

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1207061**

Sample(s) were received in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

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This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories

Position

Authorised results for

Anh Ngoc Huynh
Fung Lim Chee, Richard

Senior Chemist
General Manager

Organics
Inorganics



Analytical Results

Sub-Matrix: SOIL		Client sample ID		XRL825-0301				
		Client sampling date / time		[14-MAR-2012]				
Compound	CAS Number	LOR	Unit	HK1207061-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	22.1				
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5				
EP-075S: Acid Extractable Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorophenol	367-12-4	0.1	%	63.4				
Phenol-d6	13127-88-3	0.1	%	46.2				
2,4,6-Tribromophenol	118-79-6	0.1	%	87.9				
EP-075T: Base/Neutral Extractable Surrogates							Surrogate control limits listed at end of this report.	
Nitrobenzene -d5	4165-60-0	0.1	%	66.8				
2-Fluorobiphenyl	321-60-8	0.1	%	52.2				
4-Terphenyl-d14	1718-51-0	0.1	%	66.4				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2214240)								
HK1206938-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	43.7	42.4	2.9
HK1206938-013	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.6	17.6	0.0
EP-075C: Phthalate Esters (QC Lot: 2210164)								
HK1206788-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	46	44	4.9

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 2210164)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	102	----	75	113	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137



CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR STEPHEN LAM	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1209247
Address	: 21/F, LINCOLN HOUSE, 979 KING'S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Stephen.lam@erm.com	E-mail	: Godfrey.Chan@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: XRL 825	Quote number	: ----	Date Samples Received	: 10-APR-2012
Order number	: ----			Issue Date	: 20-APR-2012
C-O-C number	: H008536			No. of samples received	: 4
Site	: XRL 825			No. of samples analysed	: 4

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 13-APR-2012

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1209247**

Sample(s) were received in an ambient condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

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Signatories

Position

Authorised results for

Anh Ngoc Huynh
Fung Lim Chee, Richard

Senior Chemist
General Manager

Organics
Inorganics



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				XRL-825-0401	XRL-825-0402	XRL-825-0403	XRL-825-0404	
				[10-APR-2012]	[10-APR-2012]	[10-APR-2012]	[10-APR-2012]	
Compound	CAS Number	LOR	Unit	HK1209247-001	HK1209247-002	HK1209247-003	HK1209247-004	
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	19.8	21.0	22.3	19.5	
EP-075C: Phthalate Esters								
Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	<5	<5	
EP-075S: Acid Extractable Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorophenol	367-12-4	0.1	%	62.9	59.5	52.8	69.6	
Phenol-d6	13127-88-3	0.1	%	40.1	40.6	39.4	46.9	
2,4,6-Tribromophenol	118-79-6	0.1	%	66.7	70.0	65.5	95.0	
EP-075T: Base/Neutral Extractable Surrogates							Surrogate control limits listed at end of this report.	
Nitrobenzene -d5	4165-60-0	0.1	%	55.3	55.5	53.3	66.4	
2-Fluorobiphenyl	321-60-8	0.1	%	58.6	59.5	63.0	71.3	
4-Terphenyl-d14	1718-51-0	0.1	%	37.5	40.4	37.9	46.8	



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2250633)								
HK1208783-006	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	11.6	10.9	5.7
HK1209191-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	24.8	25.2	1.6
EP-075C: Phthalate Esters (QC Lot: 2250249)								
HK1209056-001	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High	Value
EP-075C: Phthalate Esters (QC Lot: 2250249)												
Bis(2-ethylhexyl)phthalate		117-81-7	5.0	mg/kg	<5	0.25 mg/kg	94.7	----	75	113	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2,4,6-Tribromophenol	118-79-6	20	122
EP-075T: Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	23	120
2-Fluorobiphenyl	321-60-8	30	115
4-Terphenyl-d14	1718-51-0	20	137