**MTR Corporation Limited**

Consultancy Agreement No.
NOL/ERL-300

# Environmental Impact Assessment of Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link

## Contamination Assessment Report and Remediation Action Plan

May 2009

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# 1. INTRODUCTION

## Project Background

1.1 The "Guangzhou – Shenzhen – Hong Kong Express Rail Link – Hong Kong Section (XRL) "(the XRL, hereinafter referred as the Project) is a 142km high-speed rail link running from West Kowloon Terminus (WKT) in Hong Kong, via Longhua and Futian in Shenzhen and Humen in Dongguan to Shibi in Guangzhou and will be connected to the high-speed national rail network now being developed, including the Beijing-Guangzhou and Hangzhou-Fuzhou-Shenzhen Passenger Lines. The alignment of the 26km Hong Kong section is shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M50/001-003**.

1.2 The Project is a designated project (DP) under Schedule 2 Part 1 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). Pursuant to section 5(7) (a) of the EIAO, Environmental Protection Department (EPD) issued MTR Corporation Limited (MTR) a study brief (EIA Study Brief (ESB) No. ESB-197/2008) to carry out the EIA study.

1.3 Land contamination impact is required to be addressed in the EIA study in accordance with the *Clause 3.4.5.3 of the ESB*. A Contamination Assessment Plan had been submitted for endorsement by EPD. Subsequently, site investigation work including soil and groundwater sampling and testing has been completed for accessible sites. This CAR/RAP report is therefore submitted to EPD for endorsement.

1.4 Geotechnics and Concrete Engineering (Hong Kong) Limited (GCE) was appointed by MTR to undertake the site investigation works as documented in the CAP, including rotary drilling of boreholes, logging of ground materials, groundwater sampling and reinstatement of excavations. Laboratory analyses were carried out by ALS Technician (HK) Pty Limited (ALS) under GCE. The data and results were gathered to prepare this CAR/RAP report. Site supervision of ground investigation was carried out by Scott Wilson Limited. AECOM Environment (formerly known as "ENSR Asia (HK) Limited") collated all the information and prepared this CAP/RAP report.

## Objectives

1.5 This combined CAR and RAP report is prepared to fulfil the requirements of *Clauses 3.4.5.3 (v) of the ESB*. In the view of the time and site constraints, the site investigation (SI) is proposed in 2 stages as proposed in the CAP. Stage 1 sampling has been conducted at hotspots with the objective to preliminary assess the worst-case locations of potential contaminated sites while Stage 2 site investigation will be conducted at the rest of the site area to assess the site condition in general after the completion of the EIA study/land resumption and prior to the commencement of construction works at respective sites.

1.6 This CAR/RAP aims to present the findings of the Stage 1 SI works of accessible sites and to assess the nature, level and extent of contamination (**Section 3**). If contamination is identified, remediation proposal suggesting appropriate remediation actions for the contaminated area are provided in the Remediation Action Plan (**Section 4**).

1.7 Stage 2 SI works will be carried out before the construction works and supplementary CAR(s) will be prepared to report the results of sampling and testing. If contamination is identified, RAP(s) will be prepared to formulate the remediation actions and Remediation Report(s) (RRs) will be prepared after completion of all remediation actions at respective sites.

1.8 This combined CAR/RAP report is submitted to seek endorsement from EPD in accordance with *Clause 3.4.5.3(v) of the ESB* under the EIA Study for Hong Kong Section of Guangzhou - Shenzhen - Hong Kong Express Rail Link.

## 2. CONTAMINATION ASSESSMENT REPORT

### Introduction

2.1 Details of the sampling rationales for identified sites have been documented separately in the CAP. An extract of the sampling schedule for all accessible sites is provided in **Appendix A** for easy reference. In this CAR section, the findings of the SI works for all accessible site including fieldworks and laboratory analyses together with the assessment of the nature, level and extent of contamination are presented.

### Progress of Site Investigation Works

2.2 **Table 2.1** details SI works completed under Stage 1 together with the remaining supplementary investigation in Stage 2 as proposed in the CAP. It should be noted that the sampling locations listed in **Table 2.1** are labelled by a different nomenclature system during SI and therefore the results under this CAR will be presented referring to the new system. The as-built/proposed sampling locations are shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/101-108**.

**Table 2.1 Summary of Completed Site Investigation Works**

| Location / Site ID | Stage of SI | Sampling Locations | | Co-ordinates | | SI Works Status |
|---|---|---|---|---|---|---|
| | | Nomenclature under CAP | New Nomenclature under this CAR | Easting | Northing | |
| **Mai Po Ventilation Building (MPV)**<br><br>Site D<br>(Container truck parking area with minor repair maintenance activities)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/101** | Stage 1 SI | D-01 | TBC* | TBC* | TBC* | Not completed in full according to the CAP.<br><br>2 of 3 proposed boreholes not able to be completed as the site is still in operation. Proposed to be conducted in Stage 2. |
| | | D-02 | TBC* | TBC* | TBC* | |
| | | D-03 | 2108/XRL/EDH40 | 824088.18 | 838976.64 | |
| | Stage 2/ Supp. SI | D-04 to D-07 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site F<br>(Construction Equipment Repair /Maintenance Workshop)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/102** | Stage 1 SI | F-01 | 2108/XRL/EDH29 | 826840.79 | 833524.63 | Completed in accordance with the CAP. |
| | | F-02 | 2108/XRL/EDH30 | 826809.11 | 833523.04 | |
| | | F-03 | 2108/XRL/EDH31 | 826818.56 | 833503.99 | |
| | | F-04 | 2108/XRL/EDH32 | 826828.99 | 833512.23 | |
| | Stage 2/ Supp. SI | F-05 to F-07 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |

| Location / Site ID | Stage of SI | Sampling Locations | | Co-ordinates | | SI Works Status |
|---|---|---|---|---|---|---|
| | | Nomenclature under CAP | New Nomenclature under this CAR | Easting | Northing | |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site G<br>(Scrap Yard)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/103** | Stage 1 SI | G-01 | 2108/XRL/EDH36 | 827157.82 | 833052.49 | Completed in accordance with the CAP. |
| | | G-02 | 2108/XRL/EDH33 | 827153.43 | 833069.03 | |
| | | G-03 | 2108/XRL/EDH35 | 827134.89 | 833065.11 | |
| | | G-04 | 2108/XRL/EDH34 | 827127.93 | 833073.67 | |
| | Stage 2/ Supp. SI | G-05-G-06 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site S**<br>(Vehicle Repair Workshop)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/104** | Stage 1 SI | S-01 | 2108/XRL/EDHS-01 | 826637.43 | 833868.80 | Completed in accordance with the CAP. |
| | | S-02 | 2108/XRL/EDHS-02 | 826637.05 | 833863.39 | |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site Q<br>(Parking area with minor vehicle repair/ maintenance activities)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/105** | Stage 1 SI | Q-01 | 2108/XRL/EDHQ-01 | 826683.81 | 833756.37 | Completed in accordance with the CAP. |
| | | Q-02 | 2108/XRL/EDHQ-02 | 826688.32 | 833772.40 | |
| | | Q-03 | 2108/XRL/EDHQ-03 | 826674.48 | 833778.64 | |
| | | Q-04 | 2108/XRL/EDHQ-04 | 826664.53 | 833765.61 | |
| | | Q-05 | 2108/XRL/EDHQ-05 | 826654.64 | 833769.27 | |
| | Stage 2/ Supp. SI | Q-06 to Q-07 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site M<br>(Open Area)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/106** | Stage 1 SI | M-01 | 2108/XRL/M01 | 826718.54 | 833696.62 | Completed in accordance with the CAP. |
| | | M-02 | 2108/XRL/M02 | 826735.99 | 833694.01 | |
| | | M-03 | 2108/XRL/M03 | 826726.68 | 833713.82 | |
| | | M-04 | 2108/XRL/M04 | 826739.09 | 833715.61 | |
| | Stage 2/ Supp. SI | M-05 to M-07 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |
| **Kwai Chung Ventilation Building (KCV)**<br><br>Site H<br>(Scrap Yard)<br><br>**Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/107** | Stage 1 SI | H-01 | 2108/XRL/D329 | 824512.35 | 831793.42 | Not completed in full according to the CAP.<br>1 of 4 proposed boreholes not able to be completed as the site is still in operation )<br>Proposed to be conducted in Stage 2. |
| | | H-02 | 2108/XRL/EDH27 | 824493.63 | 831814.58 | |
| | | H-03 | 2108/XRL/EDH28 | 824470.53 | 831798.51 | |
| | | H-04 | TBC* | TBC** | TBC** | |
| | Stage 2/ Supp. SI | H-05 to H-06 | TBC* | TBC* | TBC* | To be completed after EIA study/land resumption and prior to the construction of respective site. |

| Location / Site ID | Stage of SI | Sampling Locations | | Co-ordinates | | SI Works Status |
|---|---|---|---|---|---|---|
| | | Nomenclature under CAP | New Nomenclature under this CAR | Easting | Northing | |
| **Ngau Tam Mei Landfill**<br><br>LF (Landfill)*** | Stage 1 SI | LF-01 | 2108/XRL/A4a | 824256.15 | 838210.12 | Completed in accordance with the CAP. |
| | | LF-02 | 2108/XRL/A4b | 824303.53 | 838082.35 | |
| **Figure Nos. NOL/ERL/300/C/XRL/ ENS/M57/108** | | | | | | |

Note:
*The information will be confirmed after completion of the SI works
** Stage I SI is considered to be sufficient in assessing the site condition and thus supplementary SI has not been proposed for this site
*** 2 boreholes are proposed to assess the impact of closed landfill on the construction alignment.

2.3 There are eight sites proposed in CAP accessible for site investigation. Stage 1 SI has been completed in six of the sites in accordance with the CAP requirements. Only two sites that could not be completed in full, namely:

(i) Site D (Container truck parking area with minor repair maintenance activities) at Mai Po Ventilation Building (MPV)

Two out of three boreholes proposed within Site D were not able to be completed. The two boreholes were proposed at the vehicle repair area located at the south-western portion of the site which was still under operation during site investigation.

(ii) Site H (Scrap Yard) at Kwai Chung Ventilation Building (KCV)

One out of four boreholes proposed within Site H was not able to be completed. The borehole was proposed at the scrap packing area near the oil drum storage area located at the south-western portion of the site which was still under operation during site investigation.

2.4 The remaining 3 sampling locations located at Site D (MPV) and Site H (KCV) will be carried out together with the Stage 2 supplementary investigation.

2.5 For Stage 2 supplementary SI, sampling and testing will be carried out after this EIA study/land resumption and prior to the commencement of the construction. Supplementary CAR(s) will be prepared to report the results of the site investigations and if contamination is identified, RAP(s) will be prepared to formulate the remediation actions. Remediation Report(s) (RR(s)) will be prepared after completion of all remediation actions at respective sites.

2.6 Sites required Supplementary SI works in Stage 2 are:

(i) Site D (Container truck parking area with minor repair maintenance activities) in Mai Po Ventilation Building (MPV)
(ii) Site F (Construction Equipment Repair /Maintenance Workshop);
(iii) Site G (Scrap Yard) ;
(iv) Site Q(Parking Area with minor vehicle repairing activities); and ;
(v) Site M (Open Area) in Shek Kong Stabling and Sidings; and
(vi) Site H (Scrap Yard) in Kwai Chung Ventilation Building.

**Assessment Methodology**

Soil Boring and Sampling

2.7 The SI works were carried out from 23 September 2008 to 5 May 2009. A total of 25 boreholes as proposed in the CAP were constructed at Sites D in MPV, Site F, G, M, Q and S in SSS, Site H in KCV and at area close to Ngau Tam Mei Landfill. During the SI, there were some changes to the

generic plan in the CAP to suit the relevant site conditions encountered. Soil boring at 2108/XRL/EDHQ-05 was slightly relocated due to boulders encountered at the first 1.5m below ground. In addition, soil boring at 2108/XRL/EDH40 (Site D), 2108/XRL/EDH29-30 and EDH32 (Site F), 2108/XRL/EDH 27 and EHD28 (Site H), 2108/XRL/EDHQ-02 (Site Q) and 2108/XRL/EDHS-01 and S-02 (Site S) were also slightly relocated due to site constraints. The relocated sampling locations were chosen to be representative with reference to the original locations. The locations of the boreholes are shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/101-108**.

2.8 Soil samples were generally collected at about 1m, 1.5m. 3m, 4.5m and 6m below base of existing concrete level (BBC) for all of the boreholes. Where inspection pit was excavated, disturbed sample was collected at 1m and 1.5m while undisturbed sample was collected at other depth.

2.9 For sampling to assess the impact of the historical operation of the landfill, soil samples has been collected approximately at the top level of tunnel boring.

2.10 During the SI, soil samples could not be collected at the planned depths of the proposed borehole locations and some soil samples collected were found not suitable for laboratory testing. Deviation from original sample collection and laboratory analysis plan are summarized in **Table 2.2**. In addition, some soil samples could not be collected exactly at but close to the designated depths for 2108/XRL/EDHQ-01 to EDHQ-05 due to high content of gravels or sand encountered and at 2108/XRL/EDHM03 due to presence of bitumen. At this stage, a total of 100 soil samples were collected for laboratory analysis.

**Table 2.2 Changes to Sample Collection / Laboratory Analysis Plan due to Site Constraints**

| Borehole | Sampling Depth | Changes Made | Justification |
|---|---|---|---|
| **Sample Collection** | | | |
| 2108/XRL/EDH27, | 1.5m below base of existing concrete pavement (BBC) to 6m BBC | No sample collected for testing | High rockhead level encountered. Presence of concrete and granite from 0.7m BBC to the termination of the borehole. |
| 2108/XRL/EDH28 | 1.5m BBC to 6m BBC | No sample collected for testing | High rockhead level. Presence of granite from 0.7m BBC to the termination of the borehole. |
| 2108/XRL/EDH35 | 4m BBC to 6m BBC | No sample collected for testing | Cobbles encountered, not suitable for laboratory analysis. |
| 2108/XRL/EDH36 | 6m BBC | | |
| 2108/XRL/D329 | 3.33m to 6m BBC | No sample collected for testing | Coarse gravel and Grade III granite were encountered, not suitable for laboratory analysis. |
| **Laboratory Analysis** | | | |
| 2108/XRL/EDH31 | 3.0m-3.45mBBC | Sample collected not analyzed | The sample was mainly rock and gravel. Insufficient sample for laboratory analysis. |
| | 4.5m-4.95mBBC | | |
| 2108/XRL/EDH34 | 6.0m-6.45mBBC | | |
| 2108/XRL/EDH36 | 3.0m-3.45mBBC | Sample collected not analyzed | The sample was mainly rock. Insufficient sample for laboratory analysis. |

2.11 Before drilling/excavation, the sampler and all equipment in contact with the ground were thoroughly decontaminated prior to use at each borehole by laboratory-grade detergent and steam-cleaning/ high-pressure hot water jet.

2.12 Soil samples were properly labeled and stored in cool boxes at around 4°C until delivered to the analytical laboratory. All the collected soil samples were analyzed by ALS in accordance with the analysis schedules as detailed in the CAP.

Strata Logging

2.13 Strata logging for boreholes was undertaken during the course of drilling and sampling by qualified geologists. The logs included the general stratigraphic descriptions, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics was also recorded.

Groundwater Sampling

2.14 After completion of soil sampling, groundwater samples were collected at the 11 boreholes with groundwater encountered (namely 2108/XRL/EDH29 to EDH36, EDH40 and EDHS-01 to S-02). All groundwater samples were analyzed in accordance with the analysis schedules detailed in the CAP and reproduced in **Appendix A**.

**Assessment Criteria**

Criteria for Soil and Groundwater Contamination

2.15 The assessment methodology is adopted in accordance with the *Guidance Note for Contaminated Land Assessment and Remediation* (Guidance Note 1)*, Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management* (Guidance Manual) and *Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards, and Car Repair/Dismantling Workshops* (Guidance Note 2) issued by the EPD.

2.16 Interpretation of results has made reference to those Risk-based Remediation Goals (RBRGs) presented in *Table 2.1 and Table 2.2* as stipulated in the Guidance Manual.

2.17 The new RBRGs were developed based on a risk assessment approach to suit the local environmental conditions and community needs in Hong Kong. Decisions on contaminated soil and groundwater remediation are based on the nature and extent of the potential risks that are posed to human receptors as a result of exposure to chemicals in the soil and/or groundwater. RBRGs are developed for four different land use scenarios reflecting the typical physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater. A description of each land use scenario is as follows:

- Urban residential – Sites located in an urban area where main activities involve habitation by individuals. The typical physical setting is a high rise residential building situated in a housing estate that has amenity facilities such as landscaped yards and children's playgrounds. The receptors are residents who stay indoors most of the time except for a short period each day, during which they are outdoors and have the chance of being in direct contact with soil at landscaping or play areas within the estate.

- Rural residential – Sites located in a rural area where the main activities involve habitation by individuals. These sites typically have village-type houses or low rise residential blocks surrounded by open space. The receptors are rural residents who stay at home and spend some time each day outdoors on activities such as gardening or light sports. The degree of contact with the soil under the rural setting is more than that under the urban setting both in terms of the intensity and frequency of contact.

- Industrial – Any site where activities involve manufacturing, chemical or petrochemical processing, storage of raw materials, transport operations, energy production or transmission, etc. Receptors include those at sites where part of the operation is carried out directly on land and the workers are more likely to be exposed to soil than those working in multi-storey factory buildings.

- Public parks – Receptors include individuals and families who frequent parks and play areas where there is contact with soil present in lawns, walkways, gardens and play areas. Parks are considered to be predominantly hard covered with limited areas of predominantly landscaped soil. Furthermore, public parks are not considered to have buildings present on them.

2.18 In addition to the RBRGs, screening criteria (soil saturation limits, $C_{sat}$, developed for Non-aqueous Phase Liquid [NAPL] in soil and water solubility limits for NAPL in groundwater) for the more mobile organic chemicals must be considered to determine whether a site requires further action.

2.19 Since this Project involves the construction of a new railway, the Industrial RBRG levels should be adopted for this land contamination assessment. The post-restoration land uses of areas with potential land contamination concern are summarized in **Table 2.3.**

**Table 2.3 Post-restoration Land Uses and their Corresponding RBRGs Land Uses**

| Location | Site ID | Post-restoration Land Uses | Corresponding type of RBRG Land Uses |
|---|---|---|---|
| Mai Po Ventilation Building (MPV) | D (Container truck parking area with minor repair maintenance activities | Railway Facilities | Industrial |
| Shek Kong Stabling Sidings (SSS) | F (Construction Equipment Repair/Maintenance Workshop ) | Shek Kong Stabling Siding | Industrial |
| Shek Kong Stabling Sidings (SSS) | G (Scrap Yard) | Shek Kong Stabling Siding | Industrial |
| Shek Kong Stabling Sidings (SSS) | M (Open Area) | Railway Facilities | Industrial |
| Shek Kong Stabling Sidings (SSS) | Q (Parking Area with Minor Vehicle Repair/Maintenance Activities) | Railway Facilities | Industrial |
| Shek Kong Stabling Sidings (SSS) | S (Vehicle Repair Workshop) | Railway Facilities | Industrial |
| Kwai Chung Ventilation Building (KCV) | H (Scrap Yard) | Railway Facilities | Industrial |
| Close to Ngau Tam Mei Landfill | LF | Railway Alignment | Industrial |

2.20 The relevant soil and groundwater RBRGs for this land contamination study including $C_{sat}$ and the Solubility Limits are selectively presented in **Table 2.4.**.

**Table 2.4 Relevant RBRG Levels for Soil and Groundwater Contamination**

| Chemical | Soil (mg/kg) | | Groundwater (µg/L) | |
|---|---|---|---|---|
| | RBRGs for Industrial | Soil Saturation Limits | RBRGs for Industrial | Solubility Limits |
| **VOCs** | | | | |
| Acetone | 10,000 | *** | 10,000,000 | *** |
| Benzene | 9.21 | 336 | 54,000 | 1,750,000 |
| Bromodichloromethane | 2.85 | 1,030 | 26,200 | 6,740,000 |
| 2-Butanone | 10,000 | *** | 10,000,000 | *** |
| Chloroform | 1.54 | 1,100 | 11,300 | 7,920,000 |
| Ethylbenzene | 8,240 | 138 | 10,000,000 | 169,000 |
| Methyl tert-Butyl Ether | 70.1 | 2,380 | 1,810,000 | *** |
| Methylene Chloride | 13.9 | 921 | 224,000 | *** |
| Styrene | 10,000 | 497 | 10,000,000 | 310,000 |
| Tetrachloroethene | 0.777 | 97.1 | 2,950 | 200,000 |
| Toluene | 10,000 | 235 | 10,000,000 | 526,000 |

| Chemical | Soil (mg/kg) | | Groundwater (µg/L) | |
|---|---|---|---|---|
| | RBRGs for Industrial | Soil Saturation Limits | RBRGs for Industrial | Solubility Limits |
| Trichloroethene | 5.68 | 488 | 14,200 | 1,100,000 |
| Xylenes (Total) | 1,230 | 150 | 1,570,000 | 175,000 |
| **SVOCs** | | | | |
| Acenaphthene | 10,000 | 60.2 | 10,000,000 | 4,240 |
| Acenaphthylene | 10,000 | 19.8 | 10,000,000 | 3,930 |
| Anthracene | 10,000 | 2.56 | 10,000,000 | 43.4 |
| Benzo(a)anthracene | 91.8 | NA | NA | NA |
| Benzo(a)pyrene | 9.18 | NA | NA | NA |
| Benzo(b)fluoranthene | 17.8 | NA | 7,530 | 1.5 |
| Benzo(g,h,i)perylene | 10,000 | NA | NA | NA |
| Benzo(k)fluoranthene | 918 | NA | NA | NA |
| bis-(2-Ethylhexyl)phthalate | 91.8 | NA | NA | NA |
| Chrysene | 1,140 | NA | 812,000 | 1.6 |
| Dibenzo(a,h)anthracene | 9.18 | NA | NA | NA |
| Fluoranthene | 10,000 | NA | 10,000,000 | 206 |
| Fluorene | 10,000 | 54.7 | 10,000,000 | 1,980 |
| Hexachlorobenzene | 0.582 | NA | 695 | 6,200 |
| Indeno(1,2,3-cd)pyrene | 91.8 | NA | NA | NA |
| Naphthalene | 453 | 125 | 862,000 | 31,000 |
| Phenanthrene | 10,000 | 28 | 10,000,000 | 1000 |
| Phenol | 10,000 | 7,260 | NA | NA |
| Pyrene | 10,000 | NA | 10,000,000 | 135 |
| **Metals** | | | | |
| Cadmium | 653 | NA | NA | NA |
| Chromium III | 10,000 | NA | NA | NA |
| Chromium VI | 1,960 | NA | NA | NA |
| Copper | 10,000 | NA | NA | NA |
| Lead | 2,290 | NA | NA | NA |
| Mercury | 38.4 | NA | 6,790 | NA |
| Nickel | 10,000 | NA | NA | NA |
| Zinc | 10,000 | NA | NA | NA |
| **Petroleum Carbon Ranges** | | | | |
| $C_6$ - $C_8$ | 10,000 | 1000 | 1,150,000 | 5,230 |
| $C_9$ - $C_{16}$ | 10,000 | 3000 | 9,980,000 | 2,800 |
| $C_{17}$ - $C_{35}$ | 10,000 | 5000 | 178,000 | 2,800 |
| **PCBs** | | | | |
| PCB | 0.748 | NA | 5,110 | 31 |
| **Other Inorganic Compounds** | | | | |
| Cyanide, Free | 10,000 | NA | NA | NA |

Note: NA - Not Available

*** indicates that the $C_{sat}$ value/ solubility limit exceeds the 'ceiling limit' therefore the RBRG applies

**Results and Interpretation**

Field Records

2.21 The SI works were undertaken in accordance with the sampling plan detailed in the CAP. Soil boring logs are presented in **Appendix B**.

Laboratory Analytical Results for Soil Samples

2.22 Owing to the presence of rocks and cobbles encountered and unsuitability of some samples for laboratory analysis (please refer to **Table 2.2** for details), a total of 100 soil samples were collected during the SI for laboratory analysis at the current stage. A summary table of the laboratory testing results with the laboratory reports and standard forms adopted from Guidance Manual for assessing the soil samples are presented in **Appendix C. Table 2.5** below summarizes the sampling findings.

**Table 2.5 Summary of Laboratory Testing Results**

| Location | Site ID | No. of Drillhole | No. of Sample Tested | Compliance to Industrial RBRG | Planned Post-Restoration Land Uses |
|---|---|---|---|---|---|
| MPV | D (Container Truck Parking Area with Minor Repair/ Maintenance Activities) | 1 | 5 | All sample results complied | Railway Facilities |
| SSS | F (Vehicle Repair Workshop) | 4 | 18 | All sample results complied | Shek Kong Stabling Siding |
| SSS | G (Scrap Yard) | 4 | 14 | All sample results complied | Shek Kong Stabling Siding |
| SSS | Q (Parking Area with Minor Repair/ Maintenance Activities ) | 5 | 26 | 2 samples exceed limit for bis-(2-Ethylhexyl)phthalate | Railway Facilities |
| SSS | S (Vehicle Repair Workshop) | 2 | 10 | All sample results complied | Railway Facilities |
| SSS | M (Open Storage) | 4 | 20 | All sample results complied | Railway Facilities |
| KCV | H (Scrap Yard) | 3 | 5 | 1 sample exceed limit for bis-(2-Ethylhexyl)phthalate | Railway Facilities |
| Ngau Tam Mei Landfill | LF | 2 | 2 | All sample results complied | Railway Alignment |
| **Total** | **-** | **25** | **100** | **3 samples exceed limit for bis-(2-Ethylhexyl)phthalate** | **-** |

2.23 The analytical results indicate that the concentrations of Chemicals Of Concern (COCs) at all soil samples comply with the RBRG (industrial) except bis-(2-Ethylhexyl)phthalate which was found exceeding the respective industrial RBRG in soil samples collected at 2108/XRL/EDH 27_0.5mBBC, 2108/XRL/EDH-Q04_1.5-2.4m and 2108/XRL/EDH-Q05_4.95-5.85m. The exceedances are summarized in **Table 2.6.**

**Table 2.6 Details of Soil Sample Exceeding the Relevant RBRG Levels**

| Location | Site ID | Sample ID | Depth (m BBC) | Contaminant | Concentration (mg/kg) | RBRG (Industrial) levels (mg/kg) | Soil Saturation Limit (Csat) (mg/kg) |
|---|---|---|---|---|---|---|---|
| KCV | H | 2108/XRL/EDH27 | 0.5 | bis--(2-Ethylhexyl)phthalate | 134 | 91.8 | NA |
| SSS | Q | 2108/XRL/EDHQ-04 | 1.50-2.40 | | 2,540 | | |
| | | 2108/XRL/EDHQ-05 | 4.95-5.85 | | 356 | | |

2.24 With reference to the Guidance Manual, soil Saturation Limit ($C_{sat}$) for bis--(2-Ethylhexyl)phthalate is not available considering that this chemical has little mobility in nature and the potential occurrence of bis--(2-Ethylhexyl)phthalate be present in the environment as NAPL is considered to be unlikely.

2.25 For assessment at Ngau Tam Mei Landfill, laboratory results indicated the two soil samples collected at the top level of the proposed tunnel section complied with the industrial RBRG levels. There is no adverse impact identified at these two locations. For the rest of tunnel alignment section under Ngau Tam Mei Landfill site, as a general precautionary measure, visual inspection of excavated materials should be conducted to screen soil for signs of contamination (e.g. discoloration, stains and odour). The inspection process should also be assisted by a photo ionization detector (PID) for volatile organics. If suspected materials are encountered during tunnel boring, sampling and testing for the parameters recommended in the sampling schedule of CAP (as shown in **Appendix A**) should be undertaken to verify any contamination. The soil bored out during excavation and tunnel boring should be temporary stockpiled and if laboratory analysis indicated exceedance of relevant RBRG levels, remediation works, should be undertaken depending on the quantity and quality of contaminated soil identified.

Results of Groundwater Analysis

2.26 During the SI, groundwater was encountered at 11 boreholes. A total of 11 groundwater samples were therefore collected the monitoring wells which were concerted from these boreholes. A summary table of the laboratory testing results with the laboratory reports and standard forms adopted from Guidance Manual for assessing groundwater samples are also provided in **Appendix C**. The detection limits Benzo (b) & Benzo (k) fluoranthene as a combined testing parameter was found greater than the RBRG level of Benzo (b) fluoranthene. No relevant RBRG level of Benzo (k) fluoranthene was available for comparison. Since the results of laboratory analysis for Benzo (b) & Benzo (k) fluoranthene were all below detection limits, remediation is not considered necessary. For all other parameters, exceedance of industrial RBRGs and solubility limit were not found and cleanup for groundwater is therefore not required.

Estimated Extent of Contamination

2.27 Based on the analytical results of soil presented above, soil samples were found to be contaminated with semi-volatile organic chemical at Site H (2108/XRL/EDH27) in KCV and Site Q (2108/XRL/EDHQ-04 and EDHQ-05) in SSS respectively according to the RBRG.

2.28 In an attempt to confine the area of contaminated soil for handling, a 5mx5m square centred at the sampling location with contamination level above the relevant RBRG level is adopted. This approach will be assisted by confirmatory testing at the excavation boundaries. If there are any exceedances of sample collected at the excavation boundaries, the excavation area will be extended until the sample collected at the excavation boundaries met the remediation target. For vertical distribution of contaminants, the depth of contamination is assumed to be 0.5m above and below the particular sampling depth with contamination identified for conservative estimation or to the level as indicated in the other samples collected in the above and below.

2.29 Based on the above approach, the extent of soil contamination with organic contaminant has been estimated and summarized in **Table 2.7** and depicted in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/151-152**.

**Table 2.7 Location, Depth and Estimated Quantity of Contaminated Soil Found**

| Location | Site ID | Borehole ID | Depth with Contaminated Soil Found (m Below Base of Concrete) | Contaminant | Estimated Contamination Extent | | |
|---|---|---|---|---|---|---|---|
| | | | | | Vertical(m BBC) (Thickness (m)) | Horizontal ($m^2$) | Volume ($m^3$) |
| KCV | H | 2108/XRL/EDH27 | 0.5 | bis--(2-Ethylhexyl) phthalate | 0-0.7m* (0.7m thick) | 25 | 17.5 |
| SSS | Q | 2108/XRL/ EDHQ-04 | 1.50-2.40m | | 1.4m-2.9m** (1.5m thick) | 25 | 37.5 |
| | Q | 2108/XRL/ EDHQ-05 | 4.95-5.85m | | 4.45m-5.85*** (1.4m thick) | 25 | 35 |
| ***Estimated Total Volume of Contamination=~90$m^3$*** | | | | | | | |

Note:
* presence of concrete and granite from 0.7m bbc to the termination of the borehole.
** sampling at 0.50-1.40m BBC indicated no exceedance of bis--(2-ethylhexyl)phthalate
*** sampling at 5.85-6.75m bbc indicated no exceedance of bis--(2-ethylhexyl)phthalate

Conclusion and Recommendation

2.30 A total of 100 soil samples and 11 groundwater samples were collected at 25 locations at identified potentially contaminated site as scheduled in the CAP under Stage 1. There are only two sites for which the planned site investigation could not be completed in full. These sites will be followed up after this CAR in the Stage 2.

2.31 According to the analytical results, only three soil samples collected at 2108/XRL/EDH27, EDHQ-04 and EDHQ-05 were found to have bis-(2-Ethylhexyl)phthalate exceeding the RBRG (industrial) whereas no exceedances of the RBRG (industrial) were found among all groundwater samples collected, as such remediation for groundwater is not required.

2.32 For soil remediation, a Remediation Action Plan (RAP) is presented in **Section 3** below to identify appropriate remediation actions for the contaminated soil prior to construction works commencement at Sites Q and H.

2.33 For Stage 2 SI which will be conducted after this EIA study/ land resumption and prior to the construction phase, supplementary CAR(s) will be prepared to present the results of sampling and testing for EPD's endorsement and if necessary, supplementary RAP(s) will also be submitted to EPD to endorse. Remediation Report(s) (RR(s)) will be prepared after completion of all remediation actions at respective sites. Special attention should be brought to proposed tunnel section under Ngau Tam Mei Landfill where visual inspection with the assistance of PID will be conducted as a general precautionary measure. If suspected materials are encountered during tunnel boring, sampling and testing should be undertaken to verify any contamination. The soil bored out during excavation and tunnel boring should be temporary stockpiled and if laboratory analysis indicated exceedance of relevant RBRG levels, remediation works, should be undertaken depending on the quantity and quality of contaminated soil identified.

## 3. REMEDIATION ACTION PLAN

### Objectives

3.1 This section presents possible remediation proposals and recommends appropriate remediation actions for the contaminated areas found.

3.2 The objectives of the remediation action plan (RAP) are as follows:

(i) To propose remediation method(s) for the soil contamination;

(ii) To propose a mean to confirm completed excavation of contaminated soil; and

(iii) To provide guidelines regarding handling and/or disposal of contaminated soil.

**Potential Remediation Methods**

Selection Criteria

3.3 Soil remediation options applicable to the contaminated sites of the Project were addressed based on the followings:

- Technical and cost effectiveness;
- Technology development status;
- Environmental benefits and disbenefits;
- Commercial availability;
- Experience; and
- Expertise requirement.

Available Soil Remediation Methods

3.4 A number of soil remediation technologies considered suitable for the nature of contaminant found in Phase I SI are selected for detailed examination. The applicability and limitations of the candidate treatment technologies are detailed in **Table 3.1** below.

**Table 3.1 List of Possible Remedial Measures for Contaminated Soil**

| Remediation Option | Descriptions | Applicability and Environmental Benefits | Limitations and Environmental Dis-benefits |
|---|---|---|---|
| Biopiling | *Ex-situ* bioremediation method that bacteria grow in the piled contaminated soil and degrade the waste into harmless products. | ● Effective to TPH and other wide range of organic contaminants with some successful local case studies, e.g. decontamination works at the Cheoy Lee Shipyard at Penny's Bay, reclamation works at North Tsing Yi Shipyard site.<br>● Most cost-effective for large volumes of contaminated soil<br>● All materials and equipment are commercially available<br>● Can be designed to be a closed system; vapour emissions can be controlled | ● Labour-intensive; require considerable maintenance<br>● Time-consuming (3-18 months required) and not cost-effective for treating small volume of soil.<br>● Space required for biopile construction |
| Ex Situ Chemox | *Ex-situ* chemical oxidation method using RegenOx™ or equivalent reagent as a contaminant mass reduction technology. Solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel) are directly mixed to excavated soils. Oxidation either destroys the contaminant or breaks down the chemical structure to enhance natural biodegradation processes. | ● Effective to a broad range of soil and groundwater contaminants including HEDP<br>● The RegenOx™ system leaves behind very little residue, limited primarily to the innocuous carbonate and bicarbonate ions. These residuals do not have a negative effect or interfere with efficient natural attenuation or enhanced bioremediation processes and do not detrimentally impact the quality of the groundwater<br>● Rapid oxidation of target compounds (typically 2-6 months) | ● Initially labour-intensive;<br>● Space required for construction of treatment cells<br>● Restricted access to the working site until completion of backfilling<br>● Strong oxidizers require safe storage and handling by personnel specifically trained for handling and storage of hazardous materials.<br>● Oxidizers must be stored away from combustible materials, reducing agents, acids, bases, and sources of heat |
| Soil Venting | *In situ* bioremediation method that uses indigenous bacteria to degrade contaminants. Activity of the bacteria is enhanced by inducing air flow (using extraction or injection wells) and, if necessary, by adding nutrients. | ● Effective to volatile organic compounds (VOCs)<br>● Suitable for remediation in built up areas because wells can be placed between or below buildings<br>● Applicable to large sites with widespread contamination<br>● Uses readily available equipment; easy to install<br>● Vapour emissions can be controlled but not to the extent of biopiling due to underground soil *in-situ* properties | ● Effectiveness is limited by underground soil features e.g. soil moisture content, permeability, etc.<br>● May induce possible air emission to the sensitive receivers, off-gas treatment required.<br>● Require large space for the system development |

| Remediation Option | Descriptions | Applicability and Environmental Benefits | Limitations and Environmental Dis-benefits |
|---|---|---|---|
| Landfarming | *Ex-situ* bioremediation method that mixes the soil with bacteria involving the spread and exposure of contaminated soil to atmosphere | • Very effective in treating hydrocarbons<br>• Simple to design and implement | • May induce possible dust and vapour emission to the sensitive receivers (surrounding factories and buildings) and relatively different to control<br>• Require large flat space for the system development<br>• Slow bioremediation rate and require long operation period (as long as 2 years) which may affect future development schedule |
| Natural Attenuation | *In-situ* bioremediation method which includes a variety of physical, chemical, or biological processes that, under favourable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. The *in-situ* processes include biodegradation, dispersion, dilution, sorption, volatilization, chemical or biological stabilisation, transformation, or destruction of contaminants. | • Applicable to non-halogenated VOCs/SVOCs and fuel hydrocarbons<br>• Less costly<br>• Minimal technologies are required<br>• No disturbance to on-going site operation<br>• Can be adopted in inaccessible locations, e.g. below buildings.<br>• No operations and maintenance requirements<br>• No large scale excavation is required<br>• Access to the site is mostly allowed | • Prevailing site conditions must be suitable to support the attenuation process<br>• Extensive amounts of data must be collected and analyzed to determine contaminant plume behaviour<br>• Not applicable when the plume is expanding<br>• Intermediate degradation products may be more mobile and more toxic than the original contaminant<br>• Contaminants may migrate before they are degraded<br>• Routine monitoring is required<br>• Time line for cleanup at the site is long (take over years) depending on optimal environmental / site conditions e.g. hydrogeology and geochemistry of the site |

| Remediation Option | Descriptions | Applicability and Environmental Benefits | Limitations and Environmental Dis-benefits |
|---|---|---|---|
| Excavation and Landfill Disposal | *Ex-situ* method whereby contaminants are removed by excavation of the contaminated soil and direct disposal to landfill | ● Most simple and quickest way to dispose of large volume of contaminated soil<br>● Contamination is removed definitely<br>● Higher certainty of success<br>● Wide experience in Hong Kong<br>● Applicable to all waste or mixture that meet land disposal restriction treatment standards.<br>● Common practice for shallow, highly-contaminated soils. | ● Pre-treatment may be required for contaminated soil to meet landfill disposal criteria<br>● Landfill space limited and valuable.<br>● Indirect costs to the landfill management on monitoring and maintenance<br>● Potential long-term liabilities to landfill<br>● Need large volume of clean backfill materials<br>● No access to the working site until completion of backfilling<br>● Least desirable management option. |

3.5 In assisting the formulation of appropriate remedial measures, the following factors suggested in the Guidance Note 2 would be also taken into consideration when evaluating different available remediation methods:

- degree and extent of the contamination;
- anticipated future use of the site;
- nature of the contaminates;
- soil characteristics; and
- time available for remediation.

Nature of bis-(2-Ethylhexl)phthalate

3.6 Bis(2-ethylhexyl)phthalate, is an organic chemical commonly abbreviated as DEHP. It is an odourless colourless liquid with the formula $C_6H_4(CO_2C_8H_{17})_2$. The chemical is semi-volatile, with vapour pressure of only 1.32 mm Hg at 200$^{o}$C (while vapour pressure of benzene is 100 mm Hg at 26.1$^{o}$C). It is insoluble in water but soluble in with mineral oil, hexane, and most organic solvents. It is widely used as a plasticizer in manufacturing of articles made of polyvinyl chloride (PVC) and also used as hydraulic fluid, dielectric fluid in capacitors and solvent in lightsticks. DEHP released to soil will neither evaporate nor leach into groundwater. DEHP has a strong tendency to adsorb to soil and sediments.

Proposed Remediation Method and Remediation Target

3.7 Approximately 90m$^3$ soil is contaminated with bis-(2-Ethylhexyl)phthalate at concentrations in excess of Industrial land use target levels, as defined in the Guidance Manual for the use of Industrial RBRGs. 3 locations each of approximately 25m$^2$ in areal extent are identified. Considering the potential timescale for completion, cost effectiveness and applicability of different remediation techniques listed in **Table 3.1** and the factors in **Table 3.2**, excavation and then followed by biodegradation (biopiling) and ex-situ chemical oxidation (ESCO) using a proprietary oxidant (RegenOx$^{TM}$)/ equivalent reagent are identified as the best approach.

3.8 Biodegradation is a process which makes use of the biodegrading ability of naturally occurring or specifically added bacteria to break down the contaminants in the soil or to convert them into harmless substances. The organic nature of bis-(2-Ethylhexyl)phthalate could be degraded biologically under enhanced environment Biopiling has been commonly used in remediation sites such as Former Kai Tak Airport, Choi Lee Shipyard and North Tsing Yi Shipyard.

3.9 For ESCO, the oxidant, RegenOx$^{TM}$ is found to be effective for oxidation of bis-(2-Ethylhexyl)phthalate in the soils types identified. The structure of bis(2-ethylhexyl)phthalate is comprised of a benzene-like ring and two aliphatic chains connected by ester functional groups. This makes the compound chemically very similar to benzene and aliphatic petroleum hydrocarbons and RegenOx$^{TM}$ is very effective on these materials. The soil treatment process also involves subsidiary physical and biological processes (soil mixing and biodegradation) to transform organic contaminants in soil. During the mixing process whilst the soil is homogenised in preparation for oxidant addition, the contaminant may become diluted throughout the soil matrix and as a semi volatile compound, some volatilization may occur. Additionally, contaminants that are partially oxidised during the chemical treatment become more readily available for biological degradation by indigenous soil biota. The oxidant could also be applied *in-situ* treatment, in case for deep contaminated soils (e.g. for Site Q at SSS). Injection of oxidant through wells and probes will achieve similar effects as *ex-situ* method.

3.10 The remediation target for bis-(2-Ethylhexyl)phthalate is proposed as

- the industrial landuse of RBRG i.e. 91.8 mg/kg

The decontaminated soil will generally reuse and backfill on site. These sites Q and H will be constructed to be railway related facilities. This target will be adopted in the project.

**Table 3.2 Factors for Remediation Considerations**

| Site ID | Depth of Contaminated Soil (in m Below Base of Concrete) | Contaminant Identified | Existing Contamination Level (mg/kg) | RBRG (Industrial) (mg/kg) | Soil Characteristics | Time required for Remediation |
|---|---|---|---|---|---|---|
| H (Scrap Yard) | 0.5 | bis-(2-Ethylhexl) phthalate | 134 | 91.8 | Fill material (gravel sized concrete and tile fragment) | 2-6 months (for ESCO)<br>3-12 months (for Biopile) |
| Q (Parking Area with Minor Vehicle Repair Activities) | 1.50-2.40, | | 2540 | 91.8 | Fill material (sandy clayey silt) | 2-6 months (for ESCO)<br>6-18 months (for Biopile) |
| | 4.95-5.85 | | 356 | 91.8 | Alluvium (sandy silty clay and clayey silty fine to coarse sand) | 2-6 months (for ESCO)<br>6-12 months (for Biopile) |

Note:
*Assuming remediation with biopiling/ESCO, subject to further monitoring and enhancement measures.

**Outline Process and Operation Remediation**

Excavation

3.11 Detailed design drawings for planned excavations in the indicated areas should be prepared by the Contractor. Factors such as excavation areas and depths, engineering properties and stability of the soils should be considered for safe working conditions. The excavations should be designed in accordance with the geotechnical properties of the soils and appropriate safety factors as determined by the Engineer. The excavated areas should be set out by an appropriate qualified and licensed land surveyor. Proposed contaminated zones requiring excavation are shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/151-152**.

3.12 The excavation sequence would be as follows:

- At each location as set out by the surveyor, the contaminated soil would be excavated and transferred to a lined treatment area for homogenization. Free product (if encountered) during excavation should be recovered and drummed properly and collected by licensed chemical waste collector for proper handling and treatment;
- Following excavation and prior to backfilling, confirmatory sampling and analyses should be carried out from the sidewalls and base of the excavations, at depths where contaminants were originally identified, to confirm that all the contaminated soil has been removed. Soil samples should be collected for laboratory analysis of the defined contaminant (bis-(2-Ethylhexl)phthalate). If the analytical results exceed the relevant RBRG level(s), additional soil should be excavated (in 0.5m increments vertically and/or 1m in horizontal increments depending on whether the exceeding confirmation sample is collected from a sidewall or excavation base). Additional samples should be collected and analysed until all confirmation samples are below the relevant RBRG. If the analytical results are below the relevant RBRG, removal of contaminated soil should be considered complete and the open excavations then backfilled with suitable imported or reworked site materials.

Closure Assessment

3.13 The purpose of the closure assessment is to confirm that contaminated soils excavated from the contaminated areas identified have been successfully treated to levels below the target values adopted.

3.14 One confirmation sample should be collected from the pit base and one from each sidewall of the excavation pit. Proposed locations for confirmatory sampling are shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/151-152**. The depth of sidewall samples should be at the depth where contamination was identified. In all cases, if there are any visible indications of impact/contamination, samples should be collected from the apparent impact zone(s).

3.15 Spoil generated during excavation should be placed on heavy-duty impermeable sheeting within the soil treatment area.

3.16 All construction activities should be carried out by persons appropriately trained in health and safety and appropriated personal protective equipment should be used by the persons engaged in decontamination activities. The following guidelines of health and safety should be strictly followed by all site personnel working on the contaminated area(s) at all times:

- Temporary fencing or warning ribbons will be provided to the boundary of excavation, slope crest and temporarily stockpiled areas. Where necessary, the exposed areas should be temporarily covered with impermeable sheeting during heavy rainstorm.
- Workers are required to wear appropriate protective clothing and safety equipment.
- Smoking, eating, drinking and hot-works are strictly prohibited.
- Relevant occupational health and safety regulations and guidelines during excavation should be observed.

3.17 The excavation and confirmatory sampling works should be supervised by a Land Contamination Specialist. Subsequent construction activities could only be carried out after closure assessment or remediation at the subject site is completed as agreed by the Land Contamination Specialist.

Biopiling

3.18 The locations of DEHP contaminated soil requiring biopiling are shown in **Figure Nos. NOL/ERL/300/C/XRL/ENS/M57/151-152.** The estimated volume of soil required excavation and biopiling is shown in **Table 2.7** above.

3.19 The essential steps of biopiling are outlined in the following paragraphs:

*Biopile Formation*

3.20 The formation of a biopile will be started from one end and along the longitudinal direction. A schematic diagram of biopile has been provided in **Figure No. NOL/ERL/300/C/XRL/ENS/M57/153.** Uniform starting concentrations will facilitate the control of the bioremediation and ensure a short cleanup time (as decontamination will not be controlled by patches of soil with high initial concentrations). Compaction of the biopiles by excavation machinery shall be avoided in order have uniform density of the biopiles. Bulking agents are not usually added as they are hard to be compacted during backfilling. All biopiles shall be covered by impermeable sheeting (such that not longer than 5m of a biopile shall be exposed to open air) to avoid fugitive emissions of dust or any pollutants from the biopiles affecting the surrounding environment. Adequate turning will be undertaken during biopile formation (and installation of piping) to maximize sufficient air circulation. Turning of soil may also be used during operation to enhance air circulation. Nevertheless, this will be confirmed by the cleanup progress monitoring.

3.21 Impermeable sheeting shall be placed at the bottom of the biopiles and leachate collection sump shall be constructed along the perimeter of the biopiles to prevent leachate from contaminating the underlying soil / groundwater. All leachate generated from the operation of biopiling shall be collected and recycled to the biopile.

3.22 The activated carbon filter system shall be designed, constructed, operated and maintained to ensure adequate adsorption efficiency to prevent air pollution impact to the surrounding air sensitive

receivers (ASRs), if any. The location of the exhaust of the carbon filter shall be sited as far away as possible from the nearby ASRs. The carbon adsorption system shall also be monitored regularly to check the performance of the activated carbon filter.

3.23 The first soil samples shall be taken once the construction of a biopile is completed to serve as the baseline samples. The baseline conditions shall be used as the reference conditions for assessing the cleanup progress of the subsequent biopile operation.

*Biopile Operation*

3.24 The biopile operation will involve the induction of air into each biopile resulting from the establishment of a negative pressure field within each biopile. The negative pressure encourages the "evaporation" or volatilization of part of the DEHP contamination that is adsorbed to the soil particles. The inducted air collects the vapour and transports it via the extraction pipes out of the biopile. The inducted air also maintains aerobic conditions in the soil pores which encourage biodegradation of the remaining contaminant.

3.25 As a significant part of the contaminant is not expected to be volatilized, cleanup of the remaining contaminant will depend on the biodegradation process, which produces $CO_2$. Thus, the gas obtained from the biopile shall comprise a mixture of air, water vapour, $CO_2$, and vapourized contaminant like DEHP. Exhaust air shall be passed through the activated carbon filters prior to discharge the atmosphere to remove any contaminants.

3.26 Suitable conditions in the biopile shall be maintained for the growth of microbes. Moisture will be periodically added to the soil to maintain the moisture content within 10-20%. The optimal oxygen concentration in soil gas is 15% to 20%. The soil pH shall be maintained between 5 and 8 for bacteria to survive. Nutrients are required for microbial activities in small amounts. Regular progress monitoring of the soil conditions will be conducted to ascertain these conditions have been maintained. In addition, TPH levels in the soil will also be tested to assess the decontamination performance of the system. Bacterial numbers in soil (CFU heterotrophs or CFU degraders/gram soil) is a good indicator of the health of biopile. This parameter shall be measured too whenever soil samples are collected for TPH analysis during progress monitoring.

*Biopile Cleanup Progress Monitoring*

3.27 The objective of the operation progress monitoring is twofold: i) to maintain the progress of contaminant cleanup, and ii) to ensure suitable conditions of the soil to support microbial growth. Progress monitoring will involve periodic soil gas monitoring, soil sampling, and physical parameter monitoring.

3.28 Soil gas monitoring points are installed within the biopiles. Sampling of oxygen, carbon dioxide, methane and VOC concentrations in the soil gas shall be conducted once every month. Soil gas samples are taken by pulling a gas sample from the monitoring points through a vacuum pump. In-situ measurement of soil moisture shall be included for monitoring. Soil gas sampling after placing the system in operation can establish the effectiveness of the aeration system.

3.29 It is proposed to undertake soil sampling monthly for the analysis of pH, nutrients, and bacterial number. Analyses for target contaminant (i.e. bis-(2-Ethylhexl)phthalate) for soil samples shall be conducted at least once every month or higher frequency. Monitoring shall continue until the cleanup targets are achieved. Once the cleanup targets for a location have been achieved, soil sampling at that particular location may discontinue. Progress soil monitoring results will also indicate when the biopile decontamination process stops.

*Biopile Closure Assessment*

3.30 Biopile closure assessment shall be conducted to ensure that the soil contaminant levels in the biopiles are below the cleanup target for target contaminant (i.e. bis-(2-Ethylhexl)phthalate).

3.31 The sampling frequency of one sample per 10-30 $m^3$ for biopile closure assessment is proposed considering the small volume of contaminated soil in this RAP.

3.32 Access to the sampling locations shall be through opening of heat bonded cover panels. These openings shall be closed after each access. Extracting this soil samples shall be accomplished using a hand auger or other methods approved by the Engineer.

3.33 The DEHP acceptance criterion for the soil treated with biopile shall be the remediation target - 91.8 mg/kg (industrial, RBRG) using method USEPA Method 8270 (or equivalent). Industrial RBRG limit is selected as the future land uses of the areas would be railway development. Such acceptance testing shall be conducted for each 10-30$m^3$ of soil treated by biopiling. The laboratory results are considered satisfactory when the levels of DEHP the samples meet the remediation target.

3.34 In the event that the samples still exceed the remediation target, the biopile decontamination system shall have to be continued until full remediation the soil.

3.35 Upon treatment by biopiling, the decontaminated soil shall be used as filling material or re-use on site with reference to the landuse scenario in the RBRG.

3.36 The detailed design of biopiling and necessary method statements not covered in the RAP shall be prepared by the future Contractor responsible for the remediation works; such documents shall be reviewed and endorsed by the Engineer and the Land Decontamination Specialist prior to actual remediation works.

*Ex-situ* Chemical Oxidation (ESCO)

3.37 The essential steps of ex situ chemical oxidation are outlined in the following paragraphs:

3.38 Excavated soil will be placed directly into a lined treatment cell. Mechanical soil turning will be undertaken to homogenize the soil and promote limited volatilization of the semi volatile contaminant. Turning of soil may also be used during operation to enhance air circulation however; this will be confirmed by the cleanup progress monitoring. Homogenization of the soil will provide more uniform starting concentrations to facilitate even distribution of the chemical reagents and also allow for a seamless transition from chemical oxidation to intrinsic bioremediation to shorten remedial completion timeframes. Compaction of the soil by excavation machinery will be minimised in order maintain uniform soil density. A water source should be available to maintain the desired soil moisture during treatment. Following direct application of the chemical oxidant the soil shall be covered by impermeable sheeting to minimise any particulate or fugitive emissions from the soil under treatment affecting the surrounding environment.

3.39 Impermeable sheeting forming the base of the treatment cells will incorporate a leachate collection sump around the cell perimeter. All leachate generated from the operation of treatment system shall be collected and recycled within the treatment cell.

3.40 The first soil samples shall be taken from homogenised soil prior to addition of the oxidant to serve as the baseline samples. The baseline conditions shall be used as the reference conditions for assessing the cleanup progress of the subsequent remedial operation.

*Operation*

3.41 The remedial operation will involve application of the oxidant as an 8% solution applied directly to the soil. RegenOx$^{TM}$ Part A is a Solid oxidant complex (sodium percarbonate/catalytic formulation) is added as a powder and the oxidant is activated using RegenOx$^{TM}$ Part B, an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel). During this process care should be taken to minimize the dust from the Part A. All personnel in the Exclusion Zone should be wearing proper PPE to protect eyes, lungs and skin

*Remedial Progress Monitoring*

3.42 The objective of the operation progress monitoring is twofold: i) to maintain the progress of contaminant cleanup, and ii) to ensure conditions within the soil are optimized to support indigenous microbial growth as a subsidiary intrinsic form of bioremediation. Progress monitoring will involve periodic in-situ measurement of soil moisture, soil sampling and analyses.

3.43 It is proposed to undertake soil sampling monthly for the analysis of the target contaminant (i.e. bis-(2-Ethylhexl)phthalate). Access to the sampling locations shall be through opening of heat bonded cover panels. These openings shall be closed after each access. Extracting this soil samples shall be accomplished using a hand auger or other methods approved by the Engineer. Monitoring shall continue until the cleanup targets are achieved. However, if after 3 months the concentrations of the target species have not significantly reduced then the soil will re-dosed with RegenOx$^{TM}$. Once the cleanup targets for a location have been achieved, soil sampling at that particular location may discontinue.

*Closure Assessment*

3.44 A closure assessment shall be conducted to ensure that the soil contaminant levels in the treatment cells are below the cleanup target value for bis-(2-Ethylhexl)phthalate).

3.45 The sampling frequency of one sample per 10-30m$^3$ treated soils is proposed considering the small volume of contaminated soil in this RAP.

3.46 The acceptance criterion for the treated bis-(2-Ethylhexl)phthalate) contaminated soil shall not more than 91.8 mg/kg (Industrial RBRG) as analysed and reported using USEPA Method 8270 (or equivalent). The Industrial RBRG limit is selected as the future land uses of the areas would be associated with railways development. Such acceptance testing shall be conducted for each 10-30m$^3$ of soil treated by chemical oxidation using RegenOx$^{TM}$. The laboratory results are considered satisfactory when the concentrations of bis-(2-Ethylhexl)phthalate) meet the remediation target.

3.47 In the event that the samples still exceed the remediation target, treatment will continue until the soil target values are achieved.

3.48 Following validation of successful soil treatment, the decontaminated soil shall be used as fill materials for re-use on site with reference to the land use scenario in the RBRG.

3.49 The detailed design for the treatment cell and chemical oxidation application methods together with appropriate method statements is not covered in the RAP and shall be prepared by the future Contractor responsible for the remediation works; such documents shall be reviewed and endorsed by the Engineer and the Land Decontamination Specialist prior to actual remediation works.

**Mitigation Measures and Safety Measures**

3.50 In order to minimise the potentially environmental impacts arising from the handling of potentially contaminated materials, the following environmental mitigation measures are recommended during the course of the site remediation:

- Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety;
- Excavation should be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils;
- Supply of suitable clean backfill material is needed after excavation;
- The chemical oxidant proposed (RegenOx$^{TM}$) as a contaminant mass reduction technology. Comprises a solid oxidant complex (sodium percarbonate/catalytic formulation) and an activator complex (a composition of ferrous salt embedded in a micro-scale catalyst gel).

These chemical will be securely stored, separately and way from sources of ignition or oxidizable items. Handling will & will be undertaken by persons specifically trained and wearing appropriate PPE.

- Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any discharge during transport or during wet conditions;
- Speed control for the trucks carrying contaminated materials should be enforced; and
- Vehicle wheel and body washing facilities at the site's exist points should be established and used.

3.51 In order to minimise the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations should be followed by all site personnel working on the site at all times. In addition, basic health and safety measures should be implemented, but not limited to the followings:

- Set up a list of safety measures for site workers;
- Provide written information and training on safety for site workers;
- Keep a log-book and plan showing the contaminated zones and clean zones;
- Maintain a hygienic working environment;
- Avoid dust generation;
- Provide face and respiratory protection gear to site workers if necessary;
- Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers if necessary; and
- Provide first aid training and materials to site workers.

**Remediation Report**

3.52 Remediation Report(s) (RR) for identified contaminated site(s) upon completion of remediation should be prepared by the Land Contamination Specialist to report the remediation process and demonstrate that contaminated soils are all removed, properly handled, decontaminated and re-instated. All relevant information, including details of closure assessment and photographical records, should be included in the RR. The RR should be submitted to EPD for record and endorsement prior to the commencement of any construction works.

## 4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Site investigation works involving sampling and testing of soil and groundwater have been conducted from 23 September 2008 to 5 May 2009 with reference to the CAP. This CAR/RAP report on the findings together with the necessary remediation actions.

4.2 A total of 8 sites were assessed, with 25 borehole constructed, 100 soil and 11 groundwater samples collected and analyzed. All groundwater samples and most (97) soil samples are found complied with the relevant RBRGs. Only three soil samples are found exceeding the RBRG value for bis-(2-Ethylhexyl)phthalate. The volume of contaminated soil required remediation is estimated to be around 90$m^3$.

4.3 Considering the contaminant is organic and biodegradable in nature, biopiling and *ex-situ* chemical oxidation are considered as the most suitable remediation method for the contaminated soil.

Remediation target for the contaminated soil is proposed to be the RBRG (industrial) for the post-restoration land uses of the areas would be railway development.

4.4 Supplementary SI under Stage 2 and the two sites (Site D and H) in this CAR/RAP will be followed up. The sites where supplementary SI works are required have been summarized in **Table 4.1**. Upon site access is granted, site inspection should be re-conducted to ascertain any contaminative sources and hotspot of contamination within the site. The sampling and testing schedule as recommended in the approved CAP should then be updated based on respective site situation. Revised CAPs should then be submitted to EPD for endorsement. After completion of sampling and testing, supplementary CARs and if contamination found, RAP(s) will be submitted for EPD endorsement. The revised CAPs and supplementary CARs and RAP(s) should be submitted in separate packages for different works area depending on the schedule of land resumption and the commencement of construction works for each works area.

**Table 4.1 Summary of Sites for Stage 2 Supplementary Site Investigation**

| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| **Mai Po Ventilation Building (MPV)**<br><br>Site D (Container truck parking area with minor repair maintenance activities)<br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/101** | Site Appraisal<br><br>Past land uses of the site was found to be farms, fish ponds and garages. The site is currently used as a container truck parking with minor repair/ maintenance activities. | Initial Contamination Evaluation<br><br>Potential concern due to current land use was identified. Phase 1 SI has been conducted at area with used container found and supplementary SI under Phase 2 will be carried out to assess the general site condition and vehicle repair area.<br><br>Possible Contaminants<br><br>petroleum hydrocarbons, metals and organic solvents,<br><br>Possible Remediation Methods<br><br>Depending on the contaminated soil quantity and quality, possibly:<br>• Stabilization/solidification for heavy metals.<br>• Bioremediation such as bio-pile, composting or ex-situ chemical oxidation for organic contaminants. | The area occupied mainly for vehicle maintenance. Land contamination causing insurmountable impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | A total of 6 boreholes have been proposed to assess the site condition in general and the vehicle repair area where minor repair/maintenance activities would be undertaken.<br><br>Proposed parameters to be tested are shown in **Appendix A.** | Revised CAP<br><br>Upon site access is granted, site inspection should be carried out to ascertain any contaminative sources and hotspot of contamination within the site. The sampling and testing schedule as recommended in the approved CAP should then be updated based on respective site situation and the number of sampling locations may be significantly reduced. A revised CAP should then be submitted to EPD for endorsement.<br><br>SI works will be conducted after this EIA study/land resumption and prior to the commencement of the construction when access is gained.<br><br>CAR and RAP<br><br>Upon completion of SI and laboratory testing, a CAR |

| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| | | | | | should be submitted to EPD for endorsement. If contamination is identified, a RAP should also be submitted to EPD for endorsement before construction at the site commences.<br><br>RR<br>A RR should be submitted to demonstrate completion of remediation works before construction work starts at the site. |

| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site F<br>(Construction Equipment Repair /Maintenance Workshop)<br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/102** | Site Appraisal<br>Past land uses of the site was found to be farms, workshop, car park and garages. The site is currently used as a Construction Equipment Repair /Maintenance Workshop. | Initial Contamination Evaluation<br>Potential concern due to current land use was identified. Phase 1 SI has been conducted at the construction equipment repair area, oil drum storage area and parking area. Supplementary SI under Phase 2 will be carried out to assess the general site condition.<br><br>Possible Contaminants<br>petroleum hydrocarbons, metals,<br>Possible Remediation Methods<br>Depending on the contaminated soil quantity and quality, possibly:<br>• Stabilization/solidification for heavy metals.<br>• Bioremediation such as bio-pile, composting or *ex-situ* chemical oxidation for organic contaminants. | The Site was occupied mainly for construction equipment repair / maintenance. Land contamination causing insurmountable impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | A total of 3 boreholes have been proposed to assess the site condition in general<br>Proposed parameters to be tested are shown in **Appendix A.** | Same as Site D. |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site G<br>(Scrap Yard)<br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/103** | Site Appraisal<br>Past land uses of the site was found to be farms, workshop, car park and garages. The site is currently used as scrap yard. | Initial Contamination Evaluation<br>Potential concern due to current land use was identified. Phase 1 SI has been conducted and Supplementary SI under Phase 2 will be carried out to further assess the general site condition.<br><br>Possible Contaminants<br>petroleum hydrocarbons, metals, organic solvents, PCB and cyanide<br>Possible Remediation Methods<br>Depending on the contaminated soil quantity and | The Site was occupied mainly for scrap storage. Land contamination causing insurmountable impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | A total of 2 boreholes have been proposed to assess the site condition in general<br>Proposed parameters to be tested are shown in **Appendix A.** | Same as Site D. |

| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| | | quality, possibly:<br>• Stabilization/solidification for heavy metals and cyanide.<br>• Bioremediation such as bio-pile, composting or *ex-situ* chemical oxidation for organic contaminants and PCB. | | | |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site Q<br>(Parking area with minor vehicle repair/ maintenance activities)<br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/105** | Site Appraisal<br>Past land uses of the site was found to be farms, workshop, car park and garages. The site is currently used as Parking area with minor vehicle repair/ maintenance activities. | Initial Contamination Evaluation<br>Potential concern due to current land use was identified. Phase 1 SI has been conducted at waste container disposal area and vehicle repair area. Supplementary SI under Phase 2 will be carried out to further assess the general site condition.<br><br>Possible Contaminants:<br>Petroleum hydrocarbons, metals and organic solvents.<br>Possible Remediation Methods<br>Depending on the contaminated soil quantity and quality, possibly:<br>• Stabilization/solidification for heavy metals.<br>• Bioremediation such as bio-pile, composting or *ex-situ* chemical oxidation for organic contaminants. | The Site was occupied mainly for vehicle parking with some minor repair activities. Land contamination causing insurmountable impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | A total of 2 boreholes have been proposed to assess the site condition in general.<br>Proposed parameters to be tested are shown in **Appendix A.** | Same as Site D. |
| **Shek Kong Stabling Sidings (SSS)**<br><br>Site M | Site Appraisal<br>Past land uses of the site was found to be | Initial Contamination Evaluation<br>Phase 1 SI has been conducted to assess the general site condition and the potential impact due to the presence of aboveground tank with unknown content. | The Site was occupied mainly an open area. Land contamination causing insurmountable | A total of 3 boreholes have been proposed to assess the site condition in general. | Same as Site D. |

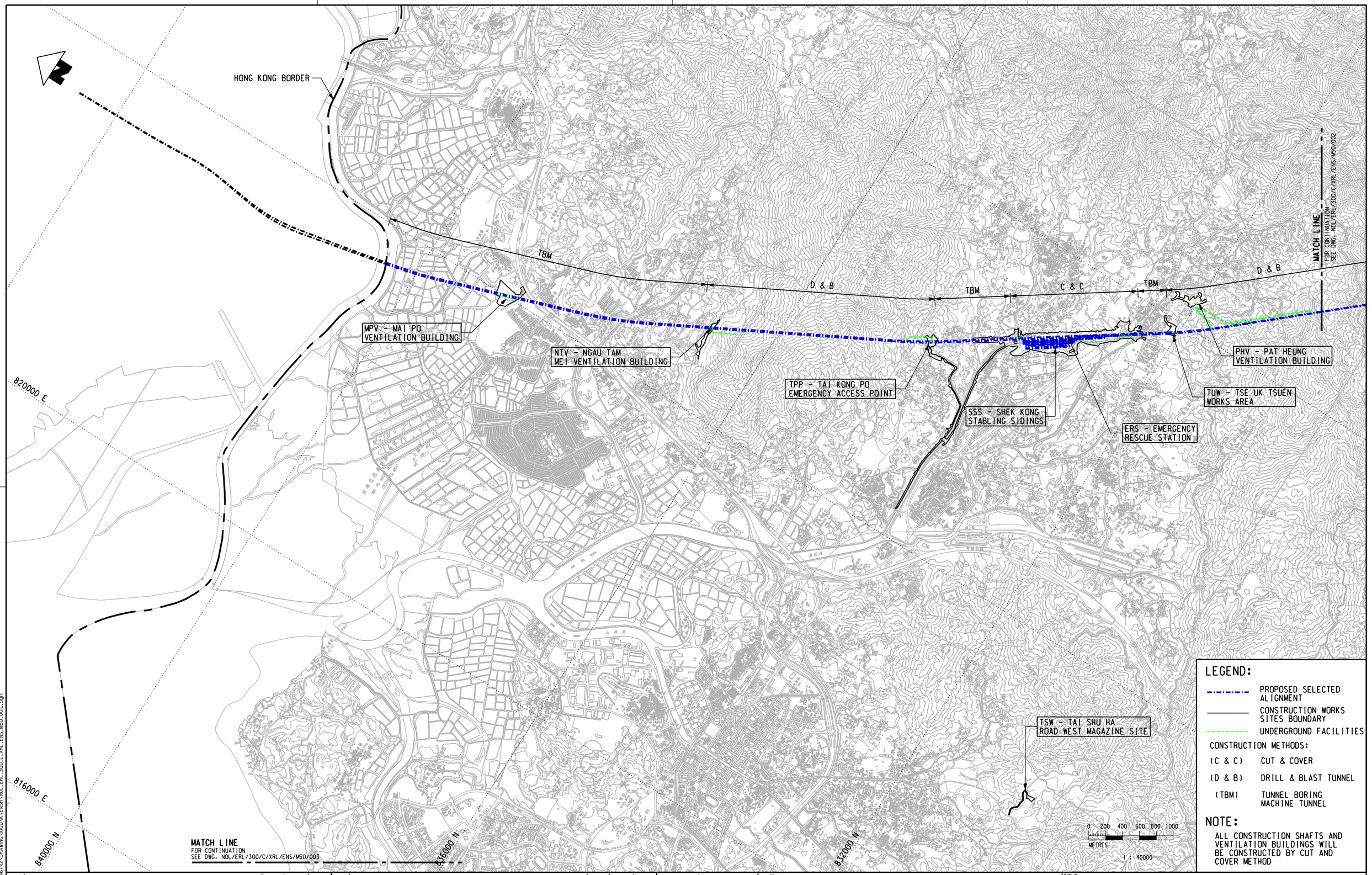
| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| (Open Area)<br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/106** | farms, workshop, car park and garages. The site is currently vacant with an aboveground tank of unknown content. | Supplementary SI under Phase 2 will be carried out to further assess the general site condition.<br><br><u>Possible Remediation Methods</u><br>Depending on the contaminated soil quantity and quality, possibly:<br>• Stabilization/solidification for heavy metals and cyanide.<br>• Bioremediation such as bio-pile, composting or *ex-situ* chemical oxidation for organic contaminants and PCB. | impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | Proposed parameters to be tested are shown in **Appendix A.** | |
| **Kwai Chung Ventilation Building (KCV)**<br><br><u>Site H (Scrap Yard)</u><br><br>**Figure Nos. NOL/ERL/300/ C/XRL/ENS/M 57/107** | <u>Site Appraisal</u><br>Past land uses of the site was found to be car park, storage area and vacant area. | <u>Initial Contamination Evaluation</u><br>Potential concern due to current land use was identified. Phase 1SI has been conducted at the scrap storage area and Supplementary SI under Phase 2 will be carried out to further assess the general site condition and the scrap packing area.<br><br><u>Possible Contaminants</u><br>petroleum hydrocarbons, metals , PCB, cyanide and organic solvents,<br><br><u>Possible Remediation Methods</u><br>Depending on the contaminated soil quantity and quality, possibly:<br>• Stabilization/solidification for heavy metals and PCB. | The Site was occupied mainly for scrap storage and packing where some oil drums were also found. Land contamination causing insurmountable impacts would not be likely. Moreover, there are available and commonly adopted remediation methods for the potential contaminants. | 3 boreholes have been proposed to assess the site condition in general and the scrap packing area where some oil drums were found.<br><br>Proposed parameters to be tested are shown in **Appendix A.** | Same as the above. |

| Site | Review of the available information | Initial contamination evaluation of those inaccessible sites and possible remediation methods | Confirmation of whether the contamination concern at this/these site(s) would be surmountable | Sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of this/these site(s) | Schedule of submission of revised CAP (if necessary), CAR, RAP and RR |
|---|---|---|---|---|---|
| | | • Bioremediation such as bio-pile and composting for organic contaminants and cyanide. | | | |

4.5 For the remediation works, to ensure complete removal of contaminated soil, a closure assessment in the form of confirmatory sampling and testing has been proposed to be conducted after excavation of contaminated soil. Remediation report(s) (RR(s)) for contaminated works area(s) should be submitted for EPD's approval upon completion of the remediation works prior to the commencement of any construction works.

4.6 Appropriate environmental mitigation measures have been recommended to minimize the potential environmental impacts of the remediation activities. Health and safety measures should be followed to minimize safety hazard posed to site workers.

# Figures




## LEGEND:

- PROPOSED SELECTED ALIGNMENT
- CONSTRUCTION WORKS SITES BOUNDARY
- UNDERGROUND FACILITIES

CONSTRUCTION METHODS:

| | |
|---|---|
| (C & C) | CUT & COVER |
| (D & B) | DRILL & BLAST TUNNEL |
| (TBM) | TUNNEL BORING MACHINE TUNNEL |

## NOTE:

ALL CONSTRUCTION SHAFTS AND VENTILATION BUILDINGS WILL BE CONSTRUCTED BY CUT AND COVER METHOD

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | GXH |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 19/AUG./2008 |

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TITLE

# NOL / ERL-300
## ENVIRONMENTAL IMPACT ASSESSMENT
### OVERALL VIEW OF ALIGNMENT

SCALE 1 : 40000 (A3)

FIGURE NO. NOL/ERL/300/C/XRL/ENS/M50/001

REV. C

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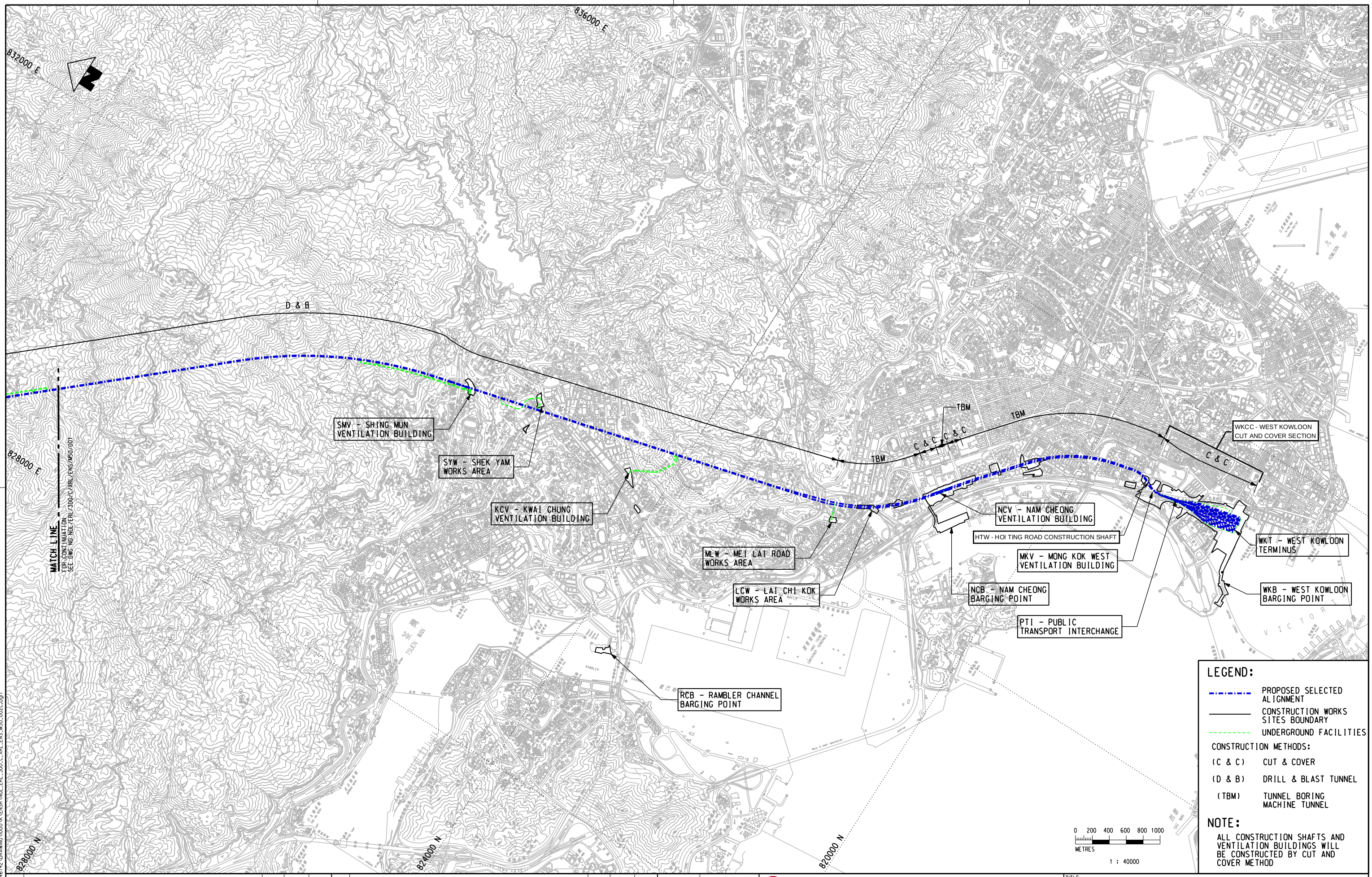


## LEGEND:

- PROPOSED SELECTED ALIGNMENT
- CONSTRUCTION WORKS SITES BOUNDARY
- UNDERGROUND FACILITIES

CONSTRUCTION METHODS:

| | |
|---|---|
| (C & C) | CUT & COVER |
| (D & B) | DRILL & BLAST TUNNEL |
| (TBM) | TUNNEL BORING MACHINE TUNNEL |

## NOTE:

ALL CONSTRUCTION SHAFTS AND VENTILATION BUILDINGS WILL BE CONSTRUCTED BY CUT AND COVER METHOD

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
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| DRAWN | GXH |
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| CHECKED | KCC |
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| DATE | 19/AUG./2008 |

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TITLE

# NOL / ERL-300
## ENVIRONMENTAL IMPACT ASSESSMENT
### OVERALL VIEW OF ALIGNMENT

SCALE 1 : 40000 (A3)

FIGURE NO. NOL/ERL/300/C/XRL/ENS/M50/002

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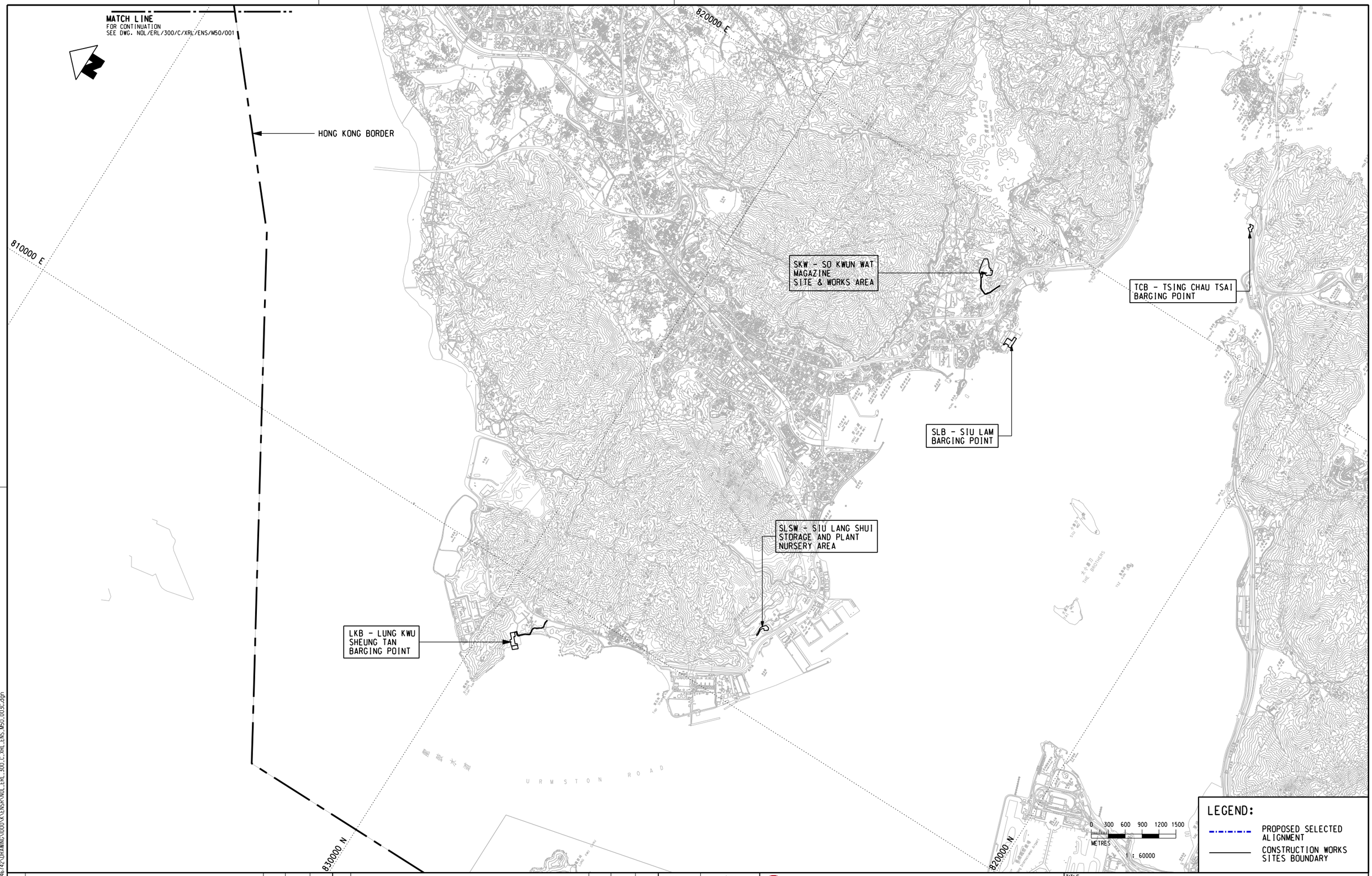


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| APPROVED | PL |
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TITLE
# NOL / ERL-300
## ENVIRONMENTAL IMPACT ASSESSMENT
OVERALL VIEW OF ALIGNMENT

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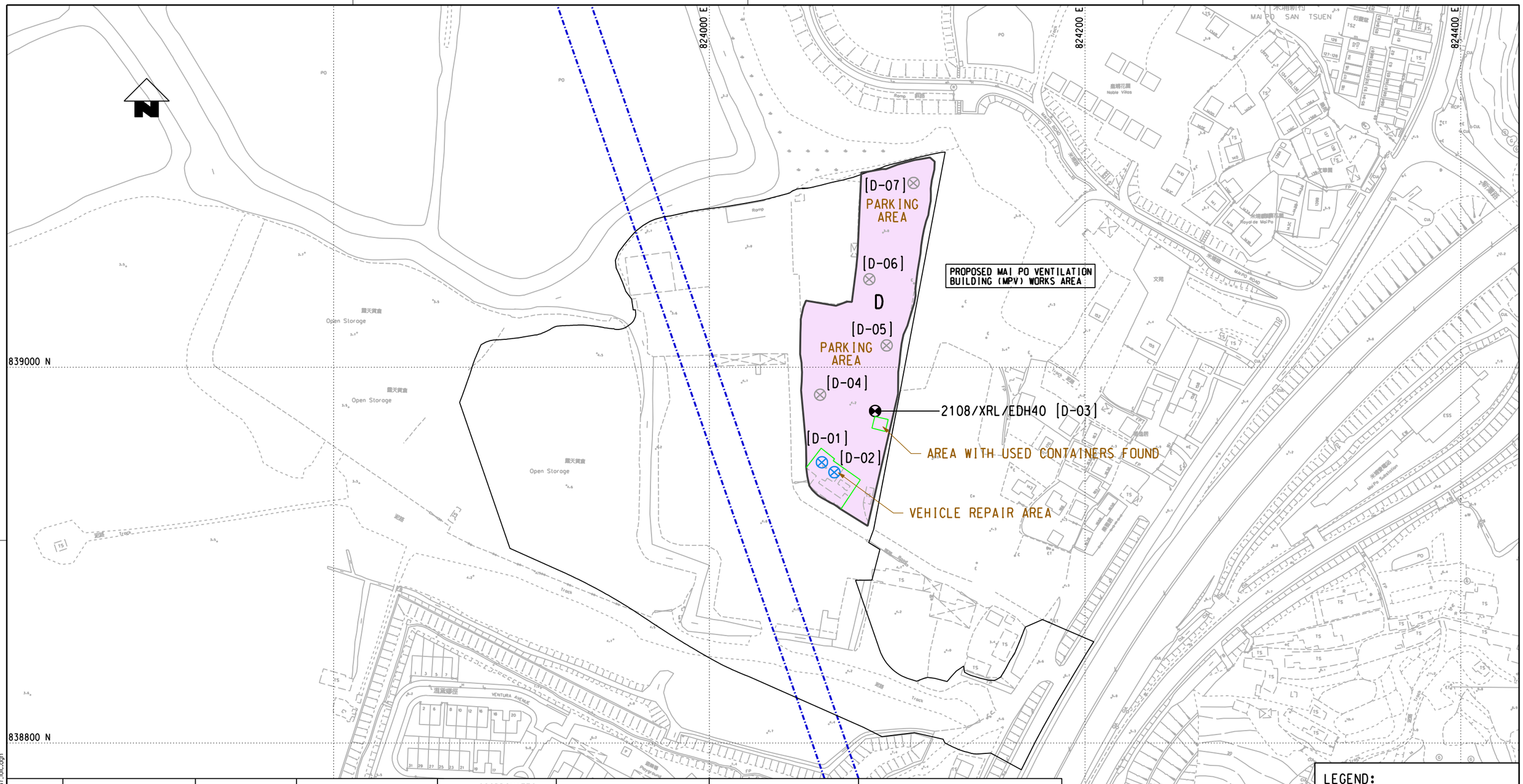


| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES EASTING | COORDINATES NORTHING | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| MPV | D (CONTAINER TRUCK PARKING AREA WITH MINOR REPAIR/ MAINTENANCE ACTIVITIES) | STAGE 1 | 2108/XRL/D329 [D-03] AREA WITH USED CONTAINERS FOUND | 824088.18 | 838976.64 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs | RAILWAY FACILITIES | ALL SAMPLE RESULTS COMPLIED |
| | | | [D-01] VEHICLE REPAIR AREA | SI AT THIS SAMPLING LOCATION IS INFEASIBLE AT THIS STAGE, SI WILL BE CONDUCTED AFTER THIS EIA STUDY AND LAND RESUMPTION BUT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS | | | | NA |
| | | | [D-02] VEHICLE REPAIR AREA | | | | | NA |
| | | STAGE 2 (SUPPLEMENTARY SI) | [D-03 TO D-04] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND LAND RESUMPTION BUT PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE CrIII, CrVI, Cu, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- BOUNDARY OF USAGE
- PROPOSED ALIGNMENT
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- SI INFEASIBLE AT CURRENT STAGE
- STAGE 2 / SUPPLEMENTARY SI

0 10 20 30 40 50 METRES
1 : 2000

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
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| DRAWN | LC |
| DESIGNED | TWF |
| CHECKED | KCC |
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| DATE | 26/JUL/2008 |

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TITLE
NOL / ERL-300
ENVIRONMENTAL INPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 2000 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/101
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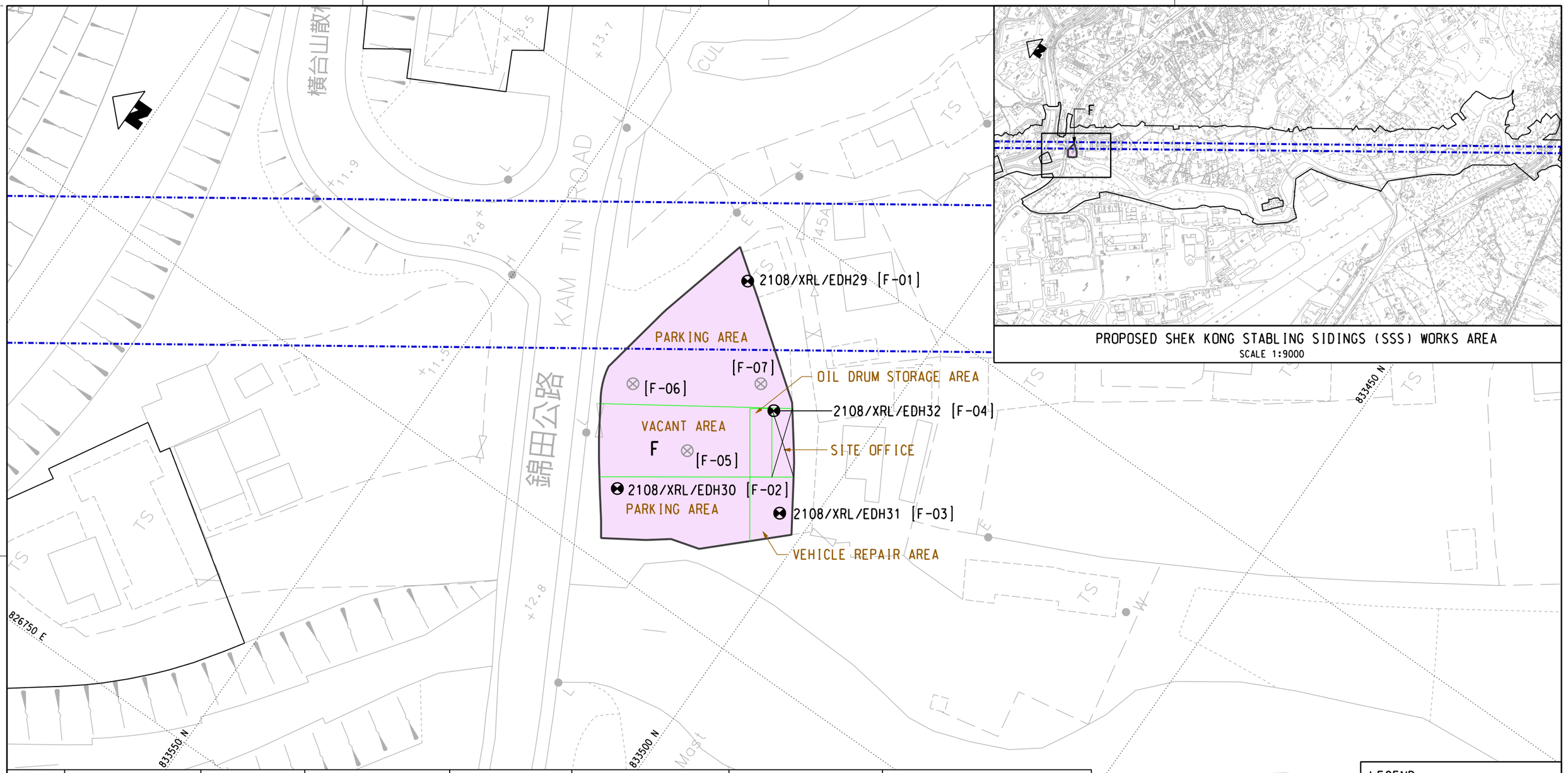
PROPOSED SHEK KONG STABLING SIDINGS (SSS) WORKS AREA
SCALE 1:9000




| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES EASTING | COORDINATES NORTHING | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| SSS | F (CONSTRUCTION EQUIPMENT REPAIR/MAINTENANCE WORKSHOP) | STAGE 1 | 2108/XRL/EDH29 [F-01] PARKING AREA | 826840.79 | 833524.63 | Pb, PETROLEUM HYDROCARBONS, BTEX | SHEK KONG STABLING SIDINGS | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDH30 [F-02] PARKING AREA | 826809.11 | 833523.04 | Pb, PETROLEUM HYDROCARBONS, BTEX | | |
| | | | 2108/XRL/EDH31 [F-03] VEHICLE REPAIR AREA | 826818.56 | 833503.99 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs | | |
| | | | 2108/XRL/EDH32 [F-04] OIL DRUMS STORAGE AREA | 826828.99 | 833512.23 | Pb, PETROLEUM HYDROCARBONS, BTEX | | |
| | | STAGE 2 (SUPPLEMENTARY SI) | [F05 TO F07] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND LAND RESUMPTION BUT PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE CrIII, CrVI, Cu, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- BOUNDARY OF USAGE
- PROPOSED ALIGNMENT
- SITE OFFICE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- STAGE 2 / SUPPLEMENTARY SI

0 2.5 5 7.5 10 12.5
METRES
1 : 500

| REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|
| REV | DESCRIPTION | BY | DATE | APPROVED |

| | |
|---|---|
| DRAWN | WDF |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 21/AUG./2008 |

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TITLE
NOL / ERL-300
ENVIRONMENTAL INPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 500 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/102
REV. C

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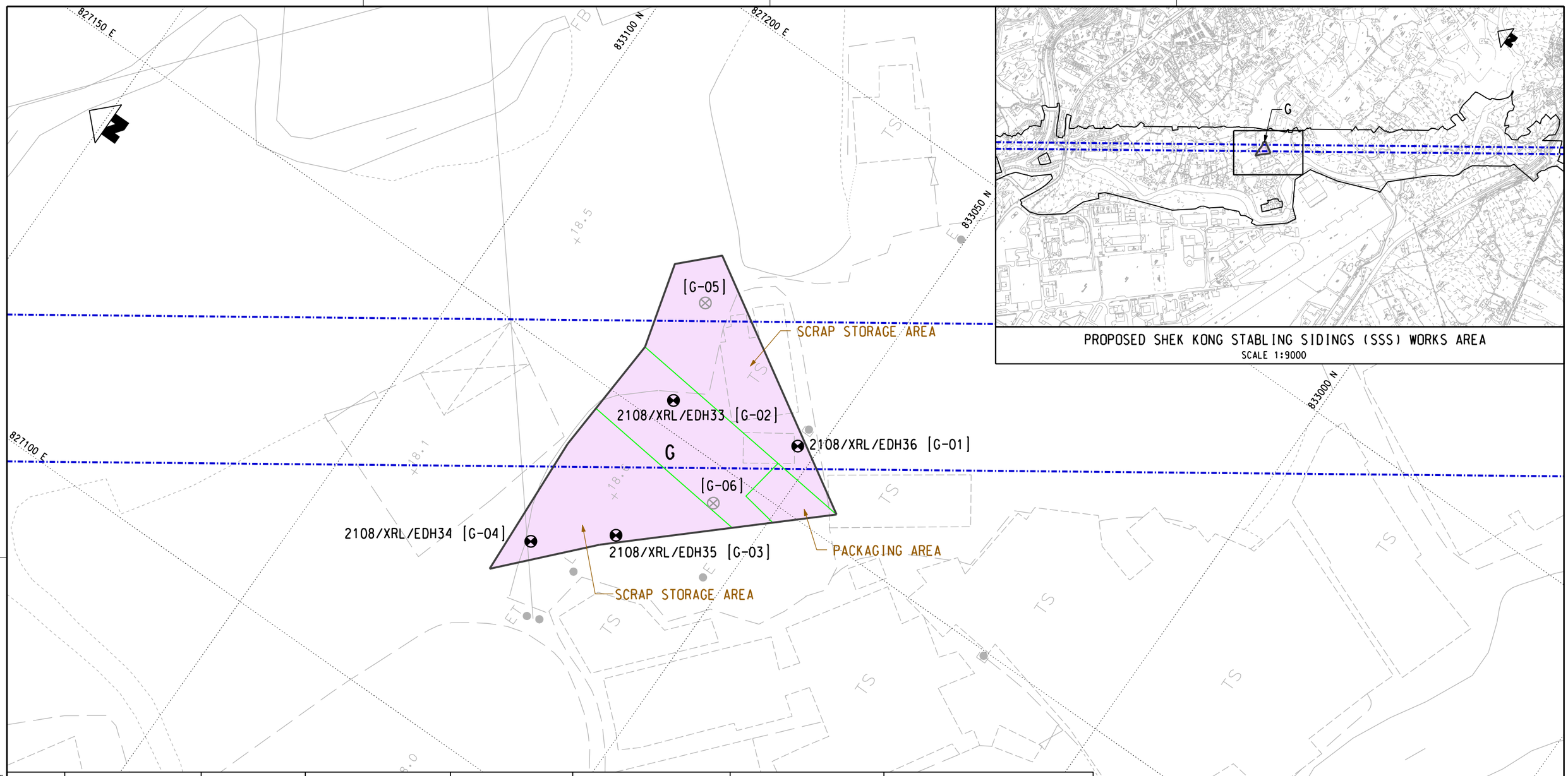


| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES | | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| | | | | EASTING | NORTHING | | | |
| SSS | G (SCRAP YARD) | STAGE 1 | 2108/XRL/EDH36 [G-01] | 827157.82 | 833052.49 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs, PCB, CYANIDE | SHEK KONG STABLING SIDINGS | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDH33 [G-02] | 827153.43 | 833069.03 | | | |
| | | | 2108/XRL/EDH35 [G-03] | 827134.89 | 833065.11 | | | |
| | | | 2108/XRL/EDH34 [G-04] | 827127.93 | 833073.67 | | | |
| | | STAGE 2 (SUPPLEMENTARY SI) | [G-05 TO G06] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- BOUNDARY OF USAGE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- STAGE 2 / SUPPLEMENTARY SI

0 2.5 5 7.5 10 12.5
METRES
1 : 500

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | WDF |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 21/AUG./2008 |

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TITLE
NOL / ERL-300
ENVIRONMENTAL INPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 500 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/103
REV. C

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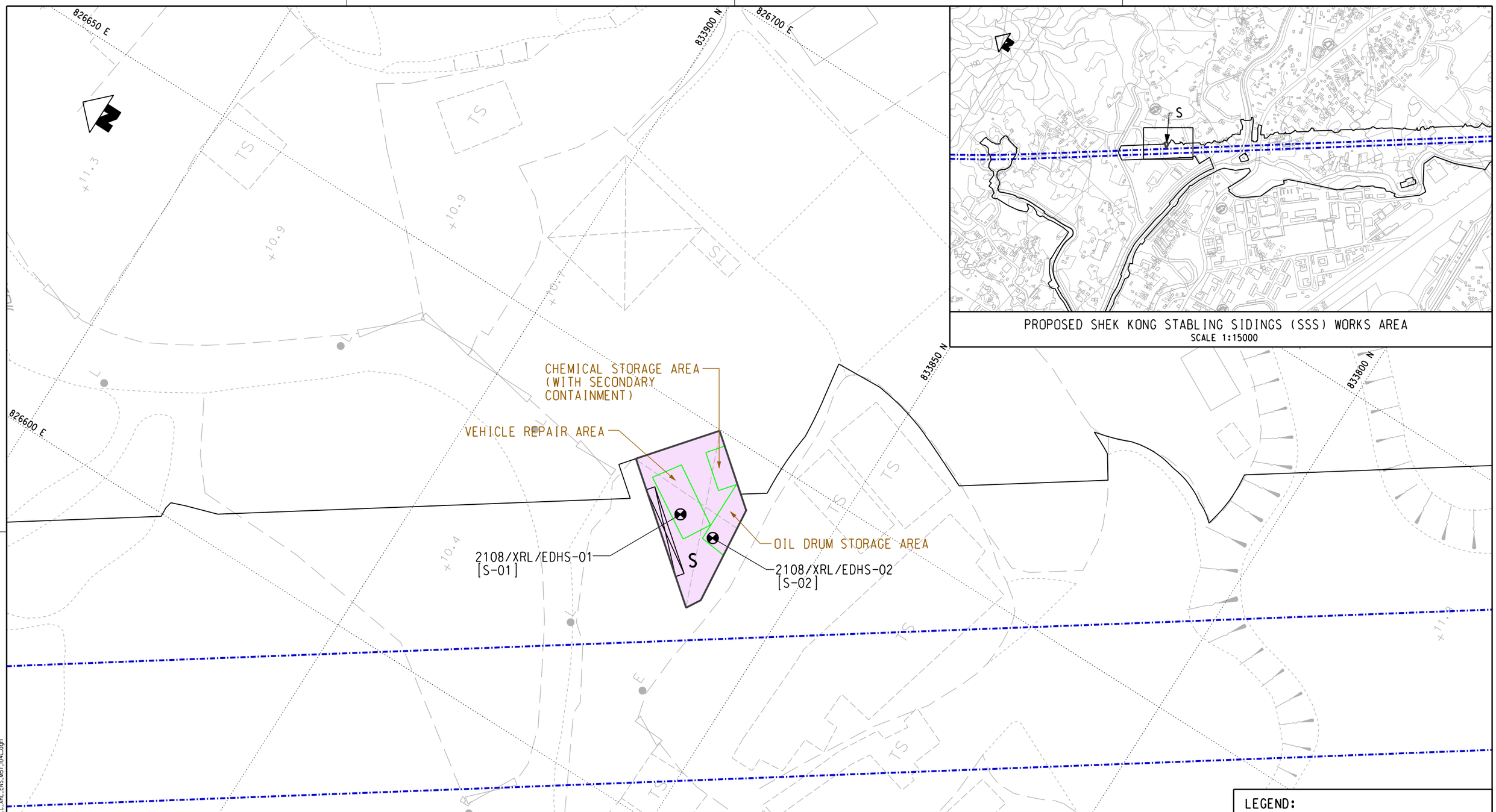


| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES | | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| | | | | EASTING | NORTHING | | | |
| SSS | S (VEHICLE REPAIR WORKSHOP) | STAGE 1 | 2108/XRL/EDHS-01 [S-01] VEHICLE REPAIR AREA | 826637.43 | 833868.8 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs | RAILWAY FACILITIES | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDHS-01 [S-02] OIL DRUM STORAGE AREA | 826637.05 | 833863.39 | | | ALL SAMPLE RESULTS COMPLIED |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
** SI LOCATIONS AT HOTSPOTS ARE CONSIDERED TO BE SUFFICIENT TO ASSESS THE SITE CONDITION AND SUPPLEMENTARY SI ARE NOT PROPOSED WITHIN THE SITE.
*** METALS INCLUDE CrIII, CrVI, Cu, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- BOUNDARY OF USAGE
- PROPOSED ALIGNMENT
- POTENTIAL CONTAMINATED SITE
- SITE OFFICE / TOOL STORAGE AREA
- AS-BUILT SAMPLING LOCATION

0 5 10 15 20 25
METRES
1 : 500

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | YJP |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 20/AUG./2008 |

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CADD REF. NOL_ERL_300_C_XRL_ENS_M57_104C.dgn

TITLE
NOL / ERL-300
ENVIRONMENTAL IMPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 500 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/104
REV. C

PLOT DRV: R:\ustnset\MTR\PLOTDRIVER\WINDOWS\A3 COLOUR.plt
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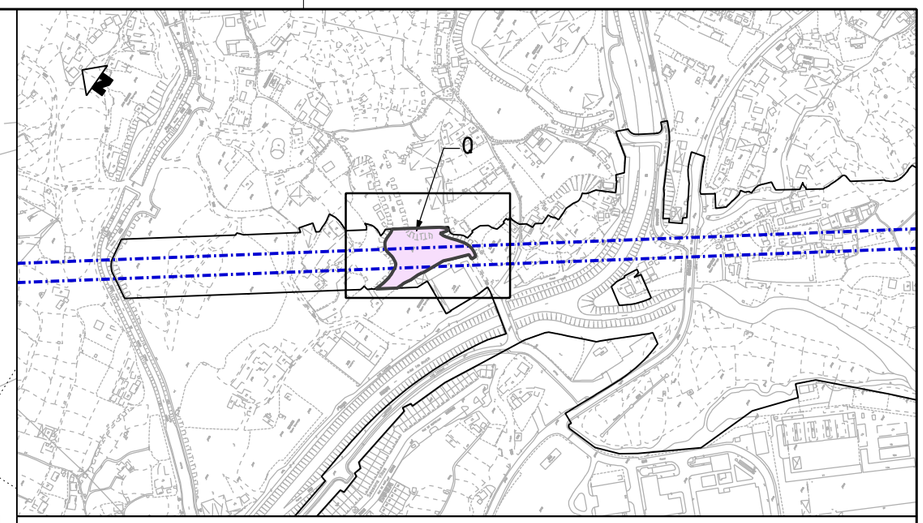
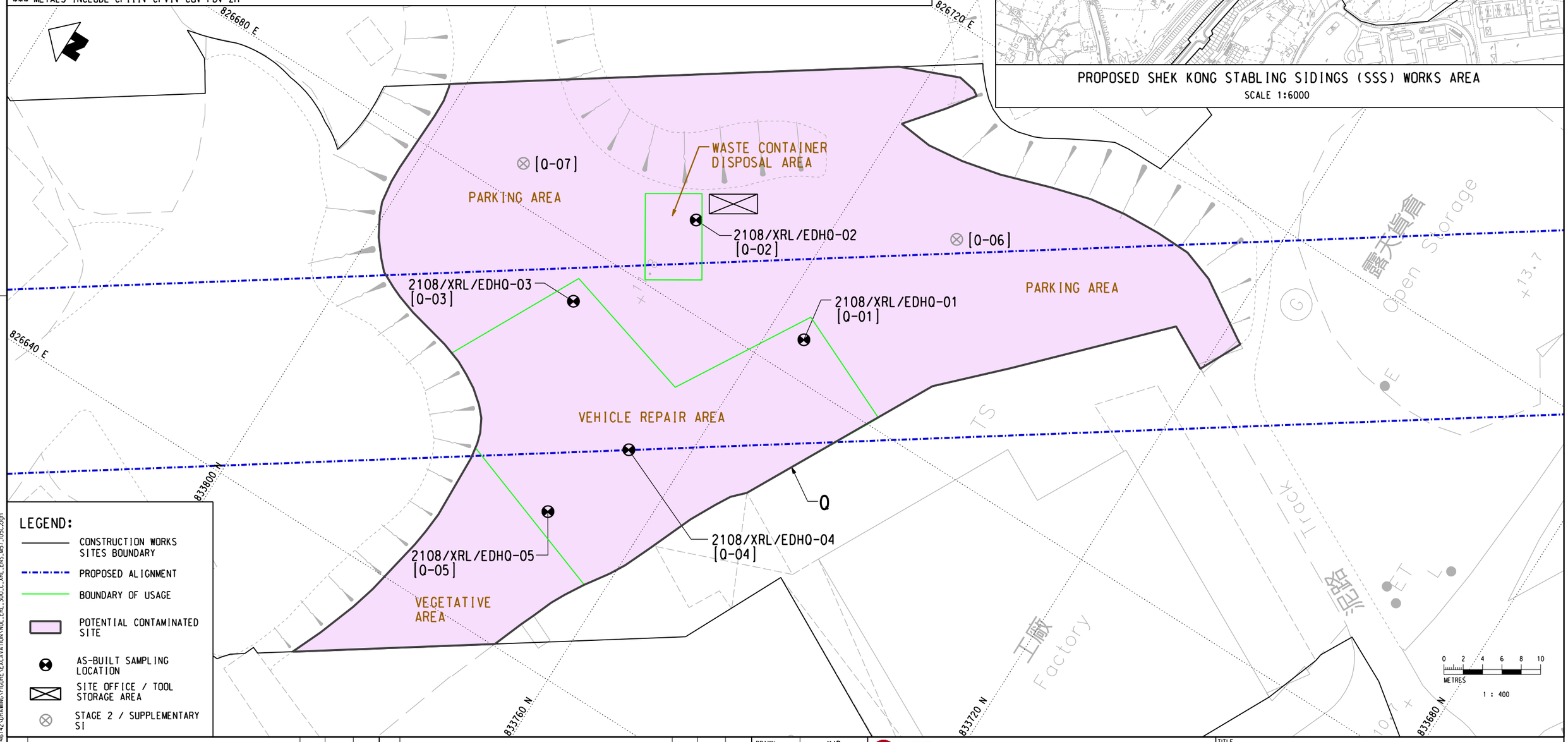
FILENAME: p:\projects\60046742\DRAWING\FIGURE\EXCAVATION\NOL_ERL_300_C_XRL_ENS_M57_104C.dgn

| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION* | CO-ORDINATES EASTING | CO-ORDINATES NORTHING | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| SSS | Q (PARKING AREA WITH MINOR VEHICLE REPAIR/ MAINTENANCE ACTIVITIES) | STAGE 1 | 2108/XRL/EDHQ-01 [Q-01] (VEHICLE REPAIR AREA) | 826683.81 | 833756.37 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs | RAILWAY FACILITIES | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDHQ-02 [Q-02] WASTE CONTAINER DISPOSAL AREA | 826688.32 | 833772.4 | | | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDHQ-03 [Q-03] (VEHICLE REPAIR AREA) | 826674.48 | 833778.64 | | | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDHQ-04 [Q-04] (VEHICLE REPAIR AREA) | 826664.53 | 833765.61 | | | 1 SAMPLE EXCEEDED LIMIT FOR BIS-(2-ETHYLHEXYL)PHTHALATE |
| | | | 2108/XRL/EDHQ-05 [Q-05] (VEHICLE REPAIR AREA) | 826654.64 | 833769.27 | | | 1 SAMPLE EXCEEDED LIMIT FOR BIS-(2-ETHYLHEXYL)PHTHALATE |
| | | STAGE 2 (SUPPLEMENTARY SI) | [Q-06 TO Q-07] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES
*** METALS INCLUDE CrIII, CrVI, Cu, Pb, Zn




PROPOSED SHEK KONG STABLING SIDINGS (SSS) WORKS AREA
SCALE 1:6000




LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- BOUNDARY OF USAGE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- SITE OFFICE / TOOL STORAGE AREA
- STAGE 2 / SUPPLEMENTARY SI

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | YJP |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 27/MAR./2009 |

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TITLE
NOL / ERL-300
ENVIRONMENTAL IMPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 400 (A3) | FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/105 | REV. C

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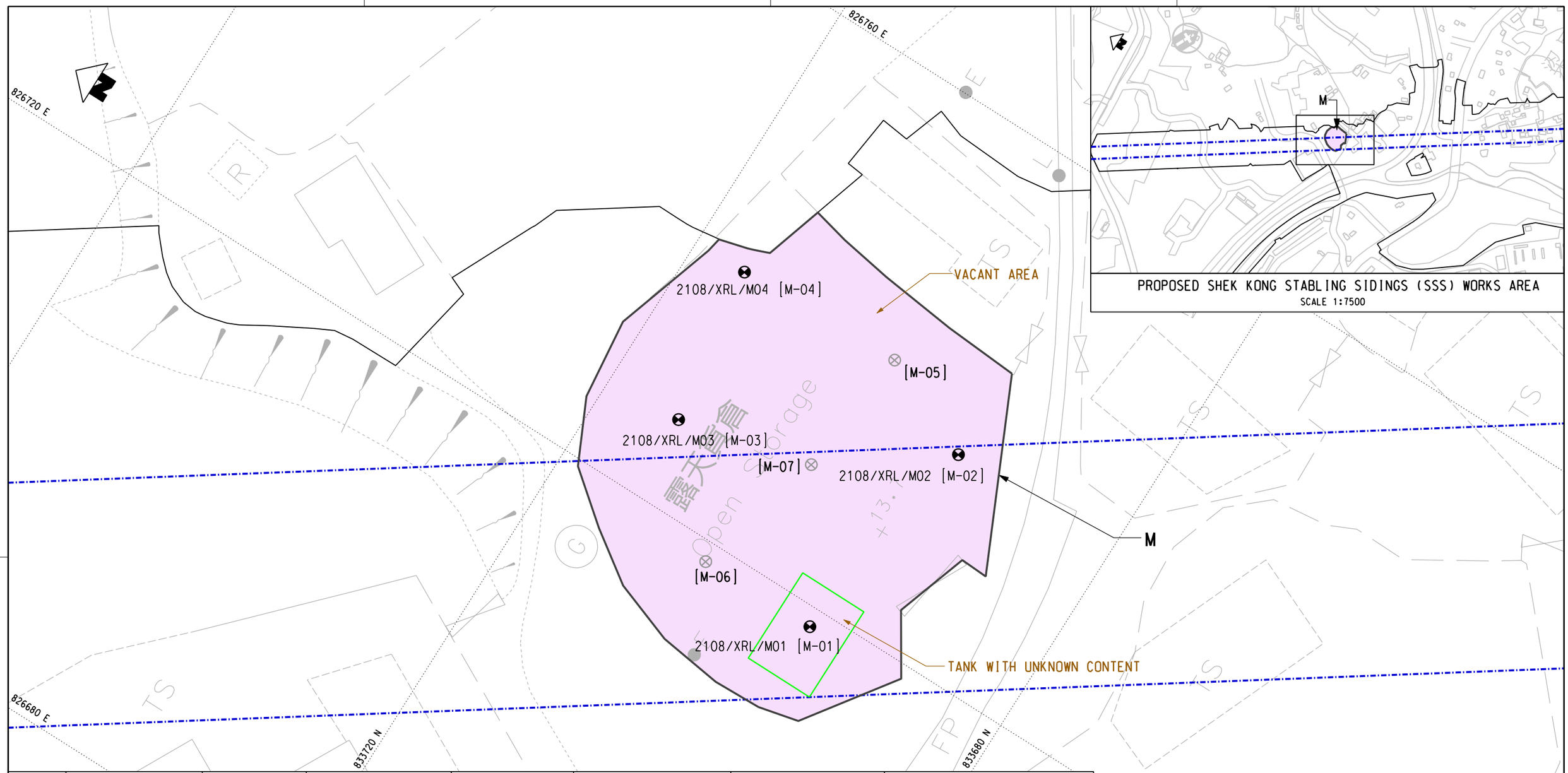


| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES | | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| | | | | EASTING | NORTHING | | | |
| SSS | M (OPEN AREA) | STAGE 1 | 2108/XRL/M01 [M-01] | 826718.54 | 833696.62 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs, PCB, CYANIDE | RAILWAY FACILITIES | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/M02 [M-02] | 826735.99 | 833694.01 | | | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/M03 [M-03] | 826726.68 | 833713.82 | | | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/M04 [M-04] | 826739.09 | 833715.61 | | | ALL SAMPLE RESULTS COMPLIED |
| | | STAGE 2 (SUPPLEMENTARY SI) | [M-05 TO M-07] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- PHASE 2 / SUPPLEMENTARY SI

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | YJP |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 27/APR./2008 |

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TITLE
NOL / ERL-300
ENVIRONMENTAL IMPACT ASSESSMENT
AS - BUILT SAMPLING LOCATION

SCALE 1 : 300 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/106
REV. C

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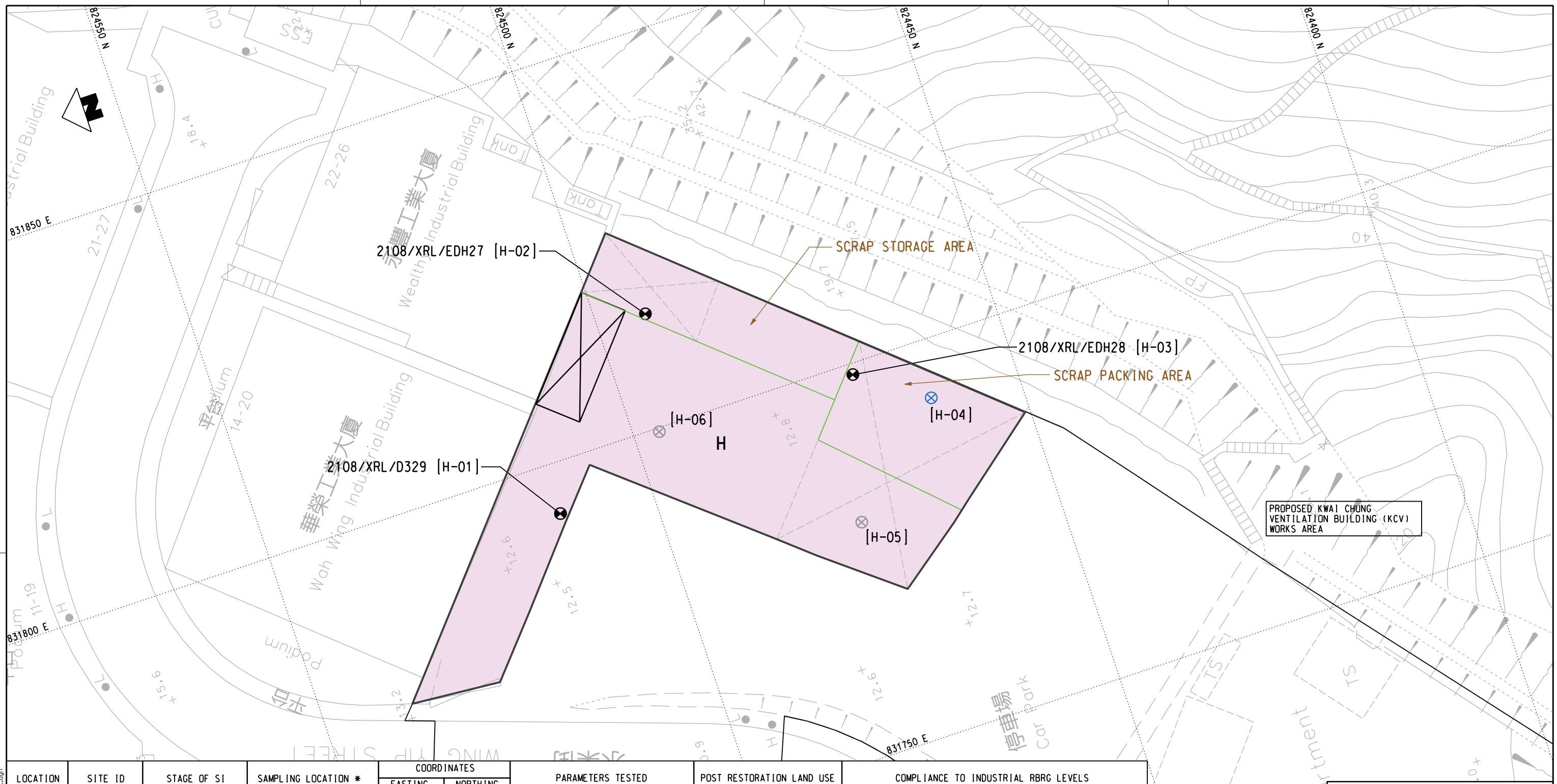


| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES EASTING | COORDINATES NORTHING | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| KCV | H (SCRAP YARD) | STAGE 1 | 2108/XRL/D329 [H-01] ACCESS ROAD | 824512.35 | 831793.42 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs, PCB, CYANIDE | RAILWAY FACILITIES | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/EDH27 [H-02] SCRAP STORAGE AREA | 824493.63 | 831814.58 | | | 1 SAMPLE EXCEEDED LIMIT FOR BIS-(2-ETHYLHEXYL)PHTHALATE |
| | | | 2108/XRL/EDH28 [H-03] SCRAP STORAGE AREA | 824470.53 | 831798.51 | | | ALL SAMPLE RESULTS COMPLIED |
| | | | [H-04] SCRAP PACKING AREA | SI AT THIS SAMPLING LOCATION IS INFEASIBLE AT THIS STAGE, SI WILL BE CONDUCTED AFTER THIS EIA STUDY AND PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS. | | | | NA |
| | | STAGE 2 (SUPPLEMENTARY SI) | [H-05 TO H06] GENERAL SITE CONDITION | AS PROPOSED IN CAP, STAGE 2 SI WILL BE CONDUCTED AFTER THE EIA STUDY AND PRIOR TO THE COMMENCEMENT OF CONSTURCTION WORKS. | | | | NA |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- BOUNDARY OF USAGE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- SITE OFFICE
- SI INFEASIBLE AT CURRENT STAGE
- STAGE 2 / SUPPLEMENTARY SI

| REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|

| | |
|---|---|
| DRAWN | LC |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 26/JUL/2008 |

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TITLE
# NOL / ERL-300
## ENVIRONMENTAL INPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 500 (A3)
FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/107
REV. C

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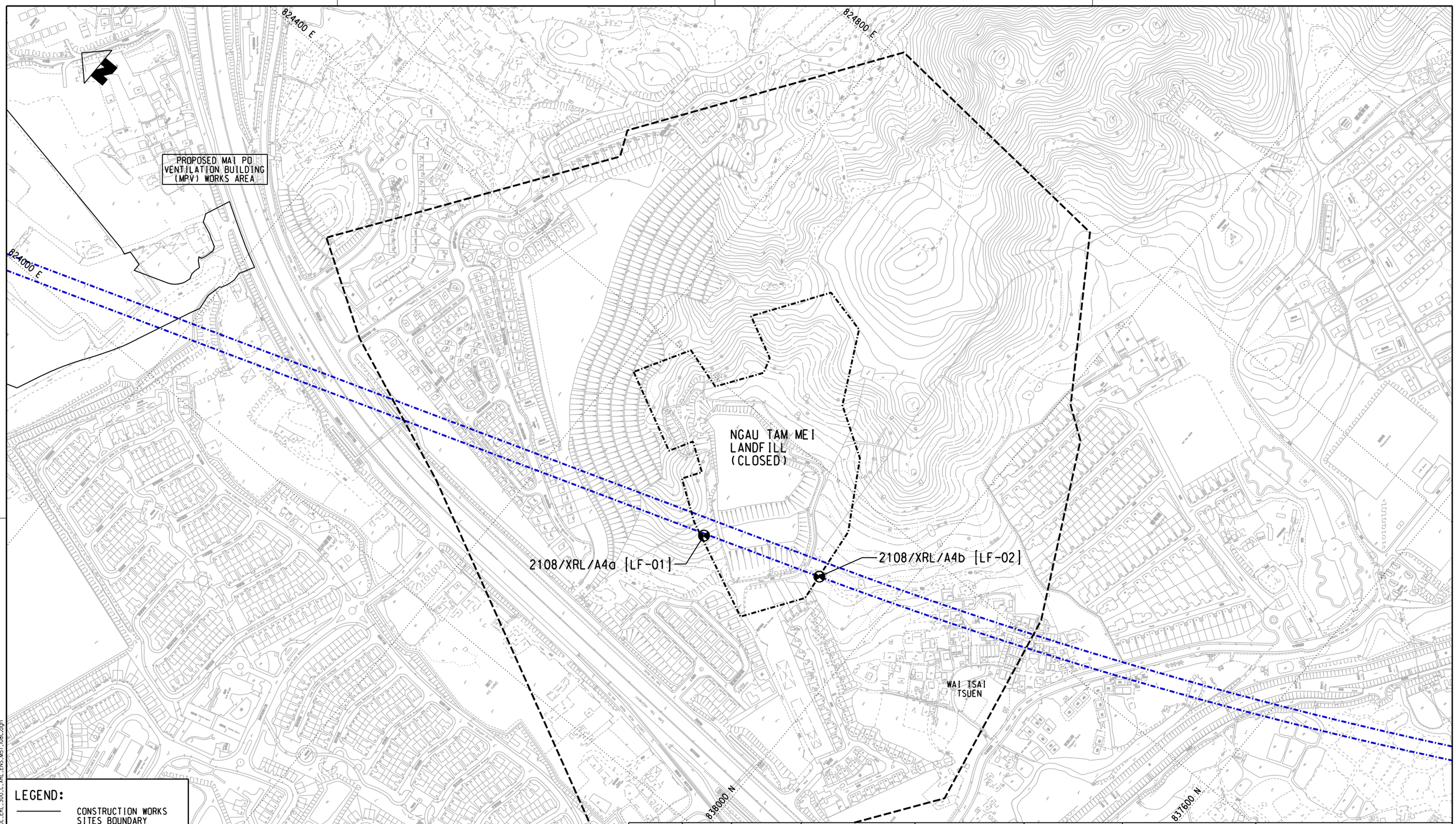


LEGEND:

- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- WASTE BOUNDARY
- CONSULTATION ZONE BOUNDARY FOR LANDFILL GAS HAZARD ASSESSMENT
- AS-BUILT SAMPLING LOCATION

| LOCATION | SITE ID | STAGE OF SI | SAMPLING LOCATION * | COORDINATES EASTING | COORDINATES NORTHING | PARAMETERS TESTED | POST RESTORATION LAND USE | COMPLIANCE TO INDUSTRIAL RBRG LEVELS |
|---|---|---|---|---|---|---|---|---|
| LANDFILL | LF | STAGE 1 | 2108/XRL/A4a [LF-01] | 824256.15 | 838210.12 | METALS***, PETROLEUM HYDROCARBONS, VOCs, SVOCs, PCB, CYANIDE | RAILWAY ALIGNMENT | ALL SAMPLE RESULTS COMPLIED |
| | | | 2108/XRL/A4b [LF-02] | 824303.53 | 838082.35 | | | ALL SAMPLE RESULTS COMPLIED |

* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
*** METALS INCLUDE Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | GXH |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 20/AUG./2008 |

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TITLE

NOL / ERL-300
ENVIRONMENTAL IMPACT ASSESSMENT
AS-BUILT SAMPLING LOCATIONS

SCALE 1 : 4000 (A3)

FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/108

REV. C

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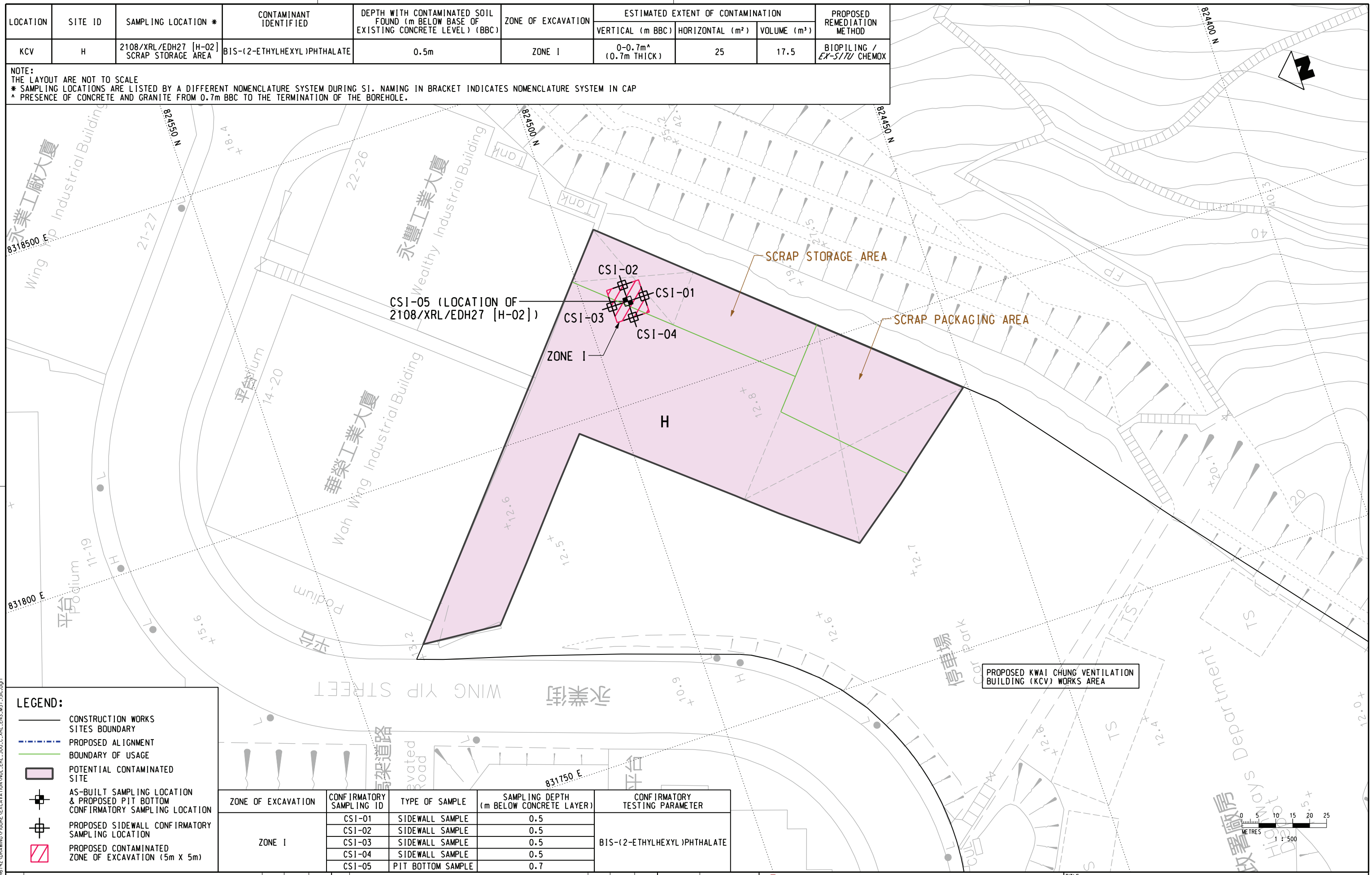
FILENAME: p:\projects\60046742\DRAWING\FIGURE\EXCAVATION\NOL_ERL_300_C_XRL_ENS_M57_108C.dgn

| LOCATION | SITE ID | SAMPLING LOCATION * | CONTAMINANT IDENTIFIED | DEPTH WITH CONTAMINATED SOIL FOUND (m BELOW BASE OF EXISTING CONCRETE LEVEL) (BBC) | ZONE OF EXCAVATION | ESTIMATED EXTENT OF CONTAMINATION | | | PROPOSED REMEDIATION METHOD |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | VERTICAL (m BBC) | HORIZONTAL (m²) | VOLUME (m³) | |
| KCV | H | 2108/XRL/EDH27 [H-02] SCRAP STORAGE AREA | BIS-(2-ETHYLHEXYL)PHTHALATE | 0.5m | ZONE I | 0-0.7m^ (0.7m THICK) | 25 | 17.5 | BIOPILING / *EX-SITU* CHEMOX |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
^ PRESENCE OF CONCRETE AND GRANITE FROM 0.7m BBC TO THE TERMINATION OF THE BOREHOLE.




LEGEND:

- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- BOUNDARY OF USAGE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION & PROPOSED PIT BOTTOM CONFIRMATORY SAMPLING LOCATION
- PROPOSED SIDEWALL CONFIRMATORY SAMPLING LOCATION
- PROPOSED CONTAMINATED ZONE OF EXCAVATION (5m X 5m)

| ZONE OF EXCAVATION | CONFIRMATORY SAMPLING ID | TYPE OF SAMPLE | SAMPLING DEPTH (m BELOW CONCRETE LAYER) | CONFIRMATORY TESTING PARAMETER |
|---|---|---|---|---|
| ZONE I | CSI-01 | SIDEWALL SAMPLE | 0.5 | BIS-(2-ETHYLHEXYL)PHTHALATE |
| | CSI-02 | SIDEWALL SAMPLE | 0.5 | |
| | CSI-03 | SIDEWALL SAMPLE | 0.5 | |
| | CSI-04 | SIDEWALL SAMPLE | 0.5 | |
| | CSI-05 | PIT BOTTOM SAMPLE | 0.7 | |

| REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|

| | |
|---|---|
| DRAWN | LC |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 26/JUL/2008 |

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ORIGINATOR
ENSR | AECOM
CADD REF. NOL_ERL_300_C_XRL_ENS_M57_151C.dgn

TITLE
NOL / ERL-300
ENVIRONMENTAL INPACT ASSESSMENT
EXTENT OF CONTAMINATION & PROPOSED CONFIRMATORY SAMPLING LOCATIONS

SCALE 1 : 500 (A3) | FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/151 | REV. C

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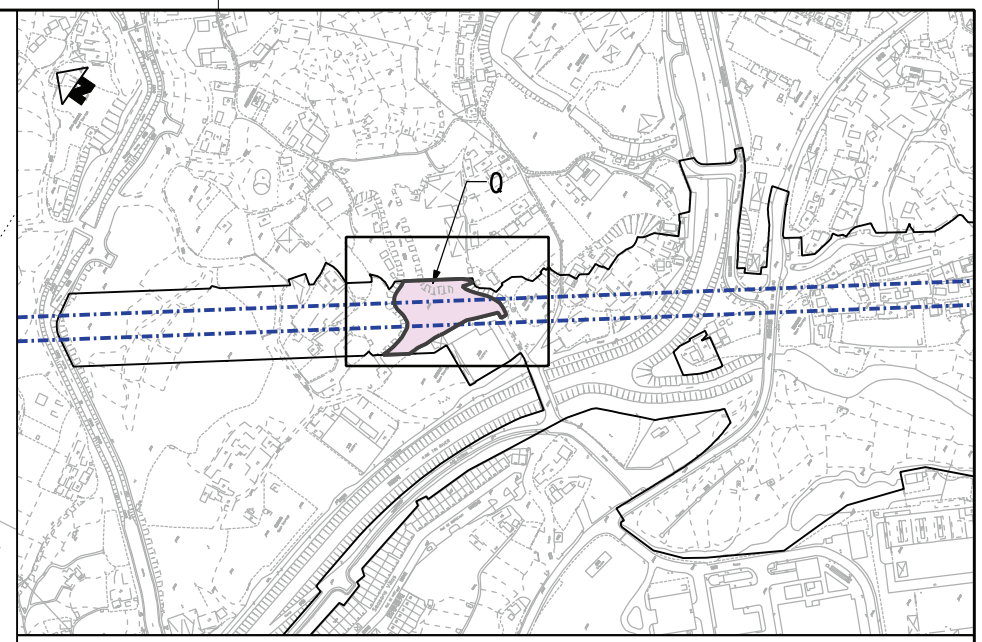
MODELNAME: Default
FILENAME: P:\projects\60046742\DRAWING\FIGURE\EXCAVATION\NOL_ERL_300_C_XRL_ENS_M57_151C.dgn
PRINTED BY: DAIKL 2008-5-20 15:46:44

| LOCATION | SITE ID | SAMPLING LOCATION* | CONTAMINANT IDENTIFIED | DEPTH WITH CONTAMINATED SOIL FOUND (m BELOW BASE OF EXISTING CONCRETE LEVEL) (BBC) | ZONE OF EXCAVATION | ESTIMATED EXTENT OF CONTAMINATION** | | | PROPOSED REMEDIATION METHOD |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | VERTICAL (m BBC) | HORIZONTAL ($m^2$) | VOLUME ($m^3$) | |
| SSS | Q | 2108/XRL/EDHQ-04 [Q-04] VEHICLE REPAIR AREA | BIS-(2-ETHYLHEXYL)PHTHALATE | 1.50-2.40m | ZONE II | 1.4m-2.9m^^ (1.5mTHICK) | 25 | 37.5 | BIOPILING / *EX-SITU* CHEMOX |
| | | 2108/XRL/EDHQ-05 [Q-05] VEHICLE REPAIR AREA | | 4.95-5.85m | ZONE III | 4.45m-5.85^^^ (1.4m THICK) | | 35 | |

NOTE:
THE LAYOUT ARE NOT TO SCALE
* SAMPLING LOCATIONS ARE LISTED BY A DIFFERENT NOMENCLATURE SYSTEM DURING SI. NAMING IN BRACKET INDICATES NOMENCLATURE SYSTEM IN CAP
** SI AT THIS SAMPLING LOCATION IS INFEASIBLE AT THIS STAGE
*** METALS INCLUDE CrIII, CrVI, Cu, Pb, Zn
^^ SAMPLING AT 0.50-1.40m BBC INDICATED NO EXCEEDANCE OF BIS-(2-ETHYLHEXYL)PHTHALATE
^^^ SAMPLING AT 5.85-6.75m BBC INDICATED NO EXCEEDANCE OF BIS-(2-ETHYLHEXYL)PHTHALATE




PROPOSED SHEK KONG STABLING SIDINGS (SSS) WORKS AREA
SCALE 1:6000

826680 E
826720 E
826640 E
833800 N
833720 N
833760 N
WASTE CONTAINER DISPOSAL AREA
PARKING AREA
PARKING AREA
VEHICLE REPAIR AREA
VEGETATIVE AREA
CS II-01
CS II-02
CS II-03
CS II-04
ZONE II
CS III-01
CS III-02
CS III-03
CS III-04
ZONE III
CS II-5 (LOCATION OF 2108/XRL/EDHQ-04 [Q-04])
2108/XRL/EDHQ-05 [Q-05]
Q
露天貨倉 Open Storage
0 2 4 6 8 10
METRES
1 : 400

LEGEND:
- CONSTRUCTION WORKS SITES BOUNDARY
- PROPOSED ALIGNMENT
- BOUNDARY OF USAGE
- POTENTIAL CONTAMINATED SITE
- AS-BUILT SAMPLING LOCATION
- AS-BUILT SAMPLING LOCATION & PROPOSED PIT BOTTOM CONFIRMATORY SAMPLING LOCATION
- PROPOSED SIDEWALL CONFIRMATORY SAMPLING LOCATION
- PROPOSED CONTAMINATED ZONE OF EXCAVATION (5m X 5m)
- SITE OFFICE / TOOL STORAGE AREA

| ZONE OF EXCAVATION | CONFIRMATORY SAMPLING ID | TYPE OF SAMPLE | SAMPLING DEPTH** (m BELOW CONCRETE LAYER) | CONFIRMATORY TESTING PARAMETER |
|---|---|---|---|---|
| ZONE II | CSII-01 | SIDEWALL SAMPLE | 1.5-2.4 | BIS-(2-ETHYLHEXYL)PHTHALATE |
| | CSII-02 | SIDEWALL SAMPLE | 1.5-2.4 | |
| | CSII-03 | SIDEWALL SAMPLE | 1.5-2.4 | |
| | CSII-04 | SIDEWALL SAMPLE | 1.5-2.4 | |
| | CSII-05 | PIT BOTTOM SAMPLE | 2.9 | |
| ZONE III * | CSIII-01 | SIDEWALL SAMPLE | 4.95-5.85 | |
| | CSIII-02 | SIDEWALL SAMPLE | 4.95-5.85 | |
| | CSIII-03 | SIDEWALL SAMPLE | 4.95-5.85 | |
| | CSIII-04 | SIDEWALL SAMPLE | 4.95-5.85 | |

NOTE:
* SAMPLING AT 5.85-6.75m BBC INDICATED NO EXCEEDANCE OF BIS-(2-ETHYLHEXYL)PHTHALATE. THEREFORE CONFIRMATORY SAMPLING AT PIT BOTTOM IS CONSIDERED NOT NECESSARY
** ONE CONFIRMATORY SAMPLING AT SIDEWALL SHOULD BE TAKEN AT DEPTH WHERE CONTAMINANTS ORIGINALLY WAS IDENTIFIED

| REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|

| | |
|---|---|
| DRAWN | YJP |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 27/MAR./2009 |

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CADD REF. NOL_ERL_300_C_XRL_ENS_M57_152C.dgn

TITLE
NOL / ERL-300
ENVIRONMENTAL IMPACT ASSESSMENT
EXTENT OF CONTAMINATION & PROPOSED CONFIRMATORY SAMPLING LOCATIONS

SCALE 1 : 400 (A3) | FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/152 | REV. C

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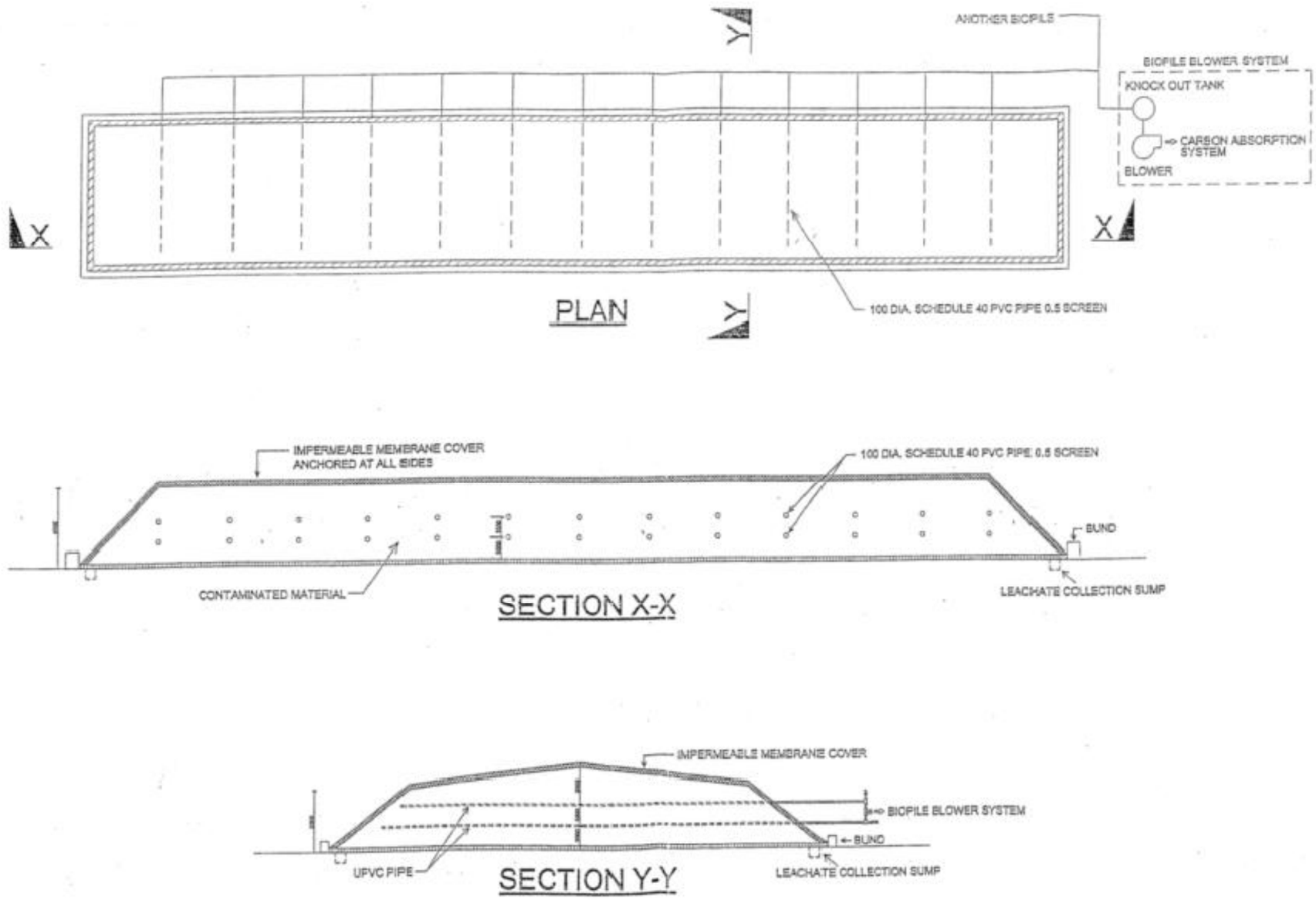
PRINTED BY: DIAXL
PLOTTED ON: 2009-5-20 15:17:41




PLAN



SECTION X-X



SECTION Y-Y

| REV | DESCRIPTION | BY | DATE | APPROVED | REV | DESCRIPTION | BY | DATE | APPROVED |
|---|---|---|---|---|---|---|---|---|---|

| | |
|---|---|
| DRAWN | HBF |
| DESIGNED | TWF |
| CHECKED | KCC |
| APPROVED | PL |
| DATE | 20/MAY./2009 |

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MTR

EXPRESS RAIL LINK

ORIGINATOR

ENSR | AECOM

CADD REF. NOL_ERL_300_C_XRL_ENS_M57_153C.dgn

TITLE

NOL / ERL-300

ENVIRONMENTAL INPACT ASSESSMENT

SCHEMATIC DIAGRAM OF BIOPILE

SCALE 1 : 500 (A3)

FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/153

REV. C

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MODELNAME: Default PRINTED BY: HANBFE 2009-5-20 10:59:10
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| Appendix A | Sampling Schedule of CAP |
| --- | --- |

**Table** Error! No text of specified style in document.**.1 Sampling and Testing Plan for Potential Contaminated Areas**

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | |
| **Railway Alignment** | | | | | | | | | | | | | | |
| Ngau Tam Mei Landfill | **Landfill Boundary** | **LF-01 LF-02** | Borehole to bedrock | Soil | at top of the tunnel section | Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn | X | - | X | - | X | X | X | In order to assess potential land contamination impacts from past landfill activities, 2 boreholes are proposed at close proximity to the landfill site.<br>Metal parameters proposed are considered to be commonly found in industrial activities in Hong Kong. Other parameters are proposed considering that they are common toxic substance found in waste.<br>According to the information provided by Preliminary Design Consultant in January 2009, the use of a TBM in conduction with an "undrained" tunnel lining effectively precludes the ingress of water into the tunnel during and following construction, and therefore it is anticipated that groundwater will not be collected from the area along the alignment immediately adjacent to the restored Ngau Tam Mei Landfill. Therefore, groundwater sampling is not proposed. | **NOL/ERL/300/C /XRL/M57/023** |

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | | |
| **SSS** | | | | | | | | | | | | | | | |
| Site F (Construction Equipment Repair/ Maintenance Workshop): Area occupied for contaminative land uses: ~600m$^2$ | **Parking Area** | **F-01 F-02** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb | X | X | - | - | - | - | - | To assess potential land contamination impacts from (i) spillage/leakage of fuels from fork lift trucks when waiting for maintenance and assess the general ground condition of the site (ii) leakage / spillage of oils during maintenance activities in vehicle repair area, and (iii) leakage / spillage of oils at the storage area, 2 boreholes are proposed in the parking area while 1 borehole is proposed at the repair area and oil drum storage area respectively.<br>For parking area, parameters are proposed with reference to fuelling area in a vehicle repair workshop as stipulated in Guidance Note 2 for similar chemical of concern and potential land contamination from fuels.<br>For vehicle repair area, parameters are proposed with reference to Guidance Note 2.<br>For oil drum storage, area, parameters are proposed with reference to the locations of fuelling areas in Guidance Note 2 for similar chemical of concern and potential land contamination from fuels.<br>3 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C /XRL/M57/014** |
| | | | | G.W. | If present | - | X | X | - | - | - | - | - | | |
| | **Vehicle Repair Area** | **F-03** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb, CrIII, CrVI, Cu, Zn | X | - | X | - | X | - | - | | |
| | | | | G.W. | If present | - | X | - | X | - | X | - | - | | |
| | **Oil Drums Storage Area** | **F-04** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb | X | X | - | - | - | - | - | | |
| | | | | G.W. | If present | - | X | X | - | - | - | - | - | | |
| | **Supplementary SI: F-05 – F-07** | | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb, CrIII, CrVI, Cu, Zn | X | X | - | - | - | - | - | | |
| | | | | G.W. | If present | - | X | X | - | - | - | - | - | | |

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | |
| Site G (Scrap yard) Area occupied for contaminative land uses:~800m$^2$ | **Scrap Storage Area** | **G-01 G-02 G-03 G-04** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn | X | - | X | - | X | X | X | 4 boreholes are proposed to access the potential land contamination impacts aroused from scrap storage and the general ground condition of the site.<br>As the scrap could be from various industrial sources, various heavy metals are proposed as testing parameters together with VOCs and SVOCs. Cyanide is also included for screening.<br>2 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C /XRL/M57/015** |
| | **Supplementary SI: G-05 – G-06** | | | G.W. | If present | Hg only | X | - | X | - | X | X | - | |
| **North SSS** | | | | | | | | | | | | | | |
| Site M (open area): Area occupied for contaminative land uses: ~1,000m$^2$ | **Above ground tank with unknown content** | **M-01 M-02 M-03 M-04** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Cd, CrIII, Cr VI, Cu, Hg, Ni, Pb, Zn | X | - | X | - | X | X | X | The site is a vegetative land with above ground tank with unknown content, 4 boreholes are proposed around this site to assess the general condition of the site.<br>A screening of heavy metals, TPH, VOC and SOC together with PCB and Cyanide are included for this site with unknown activities.<br>3 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C /XRL/M57/018** |
| | **Supplementary SI: M-05 – M-07** | | | G.W. | If present | Hg only | X | - | X | - | X | X | - | |

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | | |
| Site Q (Parking Area with Minor Vehicle Repair/ Maintenance Activities): Area occupied for contaminative land uses: ~600m$^2$ | **Scattered Vehicle Repair Area** | **Q-01 Q-03 Q-04 Q-05** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb, CrIII, CrVI, Cu, Zn | X | - | X | - | X | - | - | In order to assess potential land contamination impacts from leakage / spillage of oils during maintenance activities and from waste container disposed, 5 boreholes are proposed at the repairing area.<br>Parameters are proposed with reference to Guidance Note 2.<br>2 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C /XRL/M57/017** |
| | **Waste Container Disposal Area** | **Q-02** | | G.W. | If present | - | X | - | X | - | v | - | - | | |
| | **Supplementary SI: Q-06 – Q-07** | | | | | | | | | | | | | | |
| Site S (Vehicle Repair Workshop): Area occupied for contaminative land uses: ~100m$^2$ | **Vehicle Repair Area** | **S-01** | Borehole / Trial pit* | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb, CrIII, CrVI, Cu, Zn | X | - | X | - | X | - | - | In order to assess potential land contamination impacts from leakage / spillage of oils/ chemicals during (i) storage and (ii) maintenance activities, 1 borehole is proposed at the oil drums/ chemical storage area and vehicle repair area respectively.<br>For oil drum/ chemicals storage area, parameters are proposed with reference to chemicals/ contaminants which may be encountered due to potential contaminative activities in a vehicle repair workshop as stipulated in Guidance Note 2.<br>For vehicle repair area, parameters are proposed with reference to Guidance Note 2.<br>SI locations at hotspots are considered to be sufficient to assess the site condition and supplementary SI are not proposed within the site | **NOL/ERL/300/C /XRL/M57/016** |
| | **Oil drums storage area** | **S-02** | | G.W. | If present | - | X | - | X | - | X | - | - | | |

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | |
| **Ventilation Buildings/ Emergency Access Points** | | | | | | | | | | | | | | |
| **MPV** | | | | | | | | | | | | | | |
| Site D (Container Truck Parking Area with Minor Repair/ Maintenance Activities): Area occupied for contaminative land uses: ~150m$^2$ | **Vehicle Repair Area** | **D-01 D-02** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Pb, CrIII, CrVI, Cu, Zn | X | - | X | - | X | - | - | In order to assess potential land contamination impacts from (i) maintenance activities and (ii) container dumping, 2 boreholes are proposed at the maintenance area and 1 borehole is proposed at the container dumping area.<br>For vehicle repair area, parameters are proposed with reference to Guidance Note 2<br>For container dumping area, parameters are proposed with reference to chemicals/ contaminants which may be encountered due to potential contaminative activities in a vehicle repair workshop as stipulated in Guidance Note 2.<br>4 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C /XRL/M57/013** |
| | **Area with Used Containers Found** | **D-03** | | | | | | | | | | | | |
| | **Supplementary SI: D-04 – D-07** | | | G.W. | If present | - | X | - | X | - | X | - | - | |

| Proposed Sampling Location | Hotspots identified and/or Respective Sample ID | | Sampling Method | Sample Matrix | | Parameters to be Tested | | | | | | | Rationale of Sampling and Testing Parameters | Reference Figures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Metals | Petroleum Carbon Ranges | VOC | | SVOC# | | PCB | Cyanide | |
| | | | | | | | | BTEX only | Full List | PAH only | Full List | | | |
| **KCV** | | | | | | | | | | | | | | |
| Site H (Scrap yard) Area occupied for contaminative land uses: ~1,000m$^2$ | **Access Road** | **H-01** | Borehole to 6m BBC | Soil | 0.5, 1.5, 3.0, 4.5, 6.0 m BBC | Cd, CrIII, CrVI, Cu, Hg, Ni, Pb, Zn | X | - | X | - | X | X | X | To assess potential land contamination impacts during (i) transportation of scrap to the site and general ground condition, (ii) scrap storage and (iii) scrap packing process and the potential contamination from the storage of oil drums close the baler, 1 borehole is proposed near the entrance of the yard as a conservative approach, 2 boreholes are proposed near the scrap storage area and 1 borehole is proposed near the packing machine.<br>As the scrap could be from various industrial sources, various heavy metals are proposed as testing parameters together with VOCs and SVOCs. Cyanide is also included for screening.<br>2 supplementary SI locations are proposed to assess other areas of the site. | **NOL/ERL/300/C/XRL/M57/019** |
| | **Scrap Storage Area** | **H-02 H-03** | | | | | | | | | | | | |
| | **Scrape Packing Area** | **H-04** | | | | | | | | | | | | |
| | **Supplementary SI: H-05 – H-06** | | | G.W. | If present | Hg only | X | - | X | - | X | X | - | |

Note:
1. BBC = Below Base of Existing Concrete Pavement; GW = groundwater; X = testing proposed
2. BTEX = Be*nzene, Toluene, Ethylbenzene* and *Xylene.*
3. PAHs = The whole list of COC listed under group of SVOCs in the RBRG Table except *bis-(2-Ethylhexyl)phthalate, Hexachlorobenzene* and *Phenol.* Since RBRG value of *Benzo(a)anthracene Benzo(a)pyrene, Benzo(g,h,i)perylene Benzo(k)fluoranthene Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene* were not available for groundwater, the captioned chemicals parameters would not be tested in groundwater sample.
4. * If there are any spatial and headroom constraints for the proposed sampling locations, trial pit(s) should be considered as an alternative to collect soil samples. The maximum depth of trial pits should be at least 2m -3m BBC subject to site conditions.
5. ** The number of sampling points is proposed with reference to the *"Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair /Dismantling Workshop"*. In case the site is accessible and hotspot of contamination within the site is identified in later stage, the number of sampling point could be adjusted subject to agreement with EPD.
6. #Since the RBRG value of *Benzo(a)anthracene Benzo(a)pyrene, Benzo(g,h,i)perylene Benzo(k)fluoranthene bis-(2-Ethylhexyl)phthalate Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene* and *Phenol* were not available for groundwater, the captioned chemicals parameters would not be tested in the groundwater sample.
7. Reference should also be made to **Figure Nos. NOL/ERL/300/C/XRL/M57/013-025.**
8. Details of the sampling requirements for chemical parameters should refer to Error! Reference source not found..

Appendix B Borehole Log

**Site D**

**(2108/XRL/EDH40)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH40**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824088.18 N 838976.64** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **24/10/2008** TO **24/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+3.81** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 24/10/2008 | HX | 08:00 | | | | | | | +3.81 | 0.00 | | | Dark grey, silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and some fine to medium gravel sized moderately decomposed and slightly decomposed meta-sandstone fragments. (FILL) |
| | | | 100 | | | | | 1 2 3 INSPECTION PIT | +3.31 | 0.50 | | | |
| 1 | | | | | | | | | | 0.95 | | | Firm, greyish brown mottled yellowish brown, reddish yellow and dark grey, organic, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional subangular to subrounded fine to medium gravel sized highly decomposed meta-siltstone fragments. (FILL with intense offensive smell) |
| | | | 100 | | | | | 4 5 6 7 | +2.31 | 1.50 | | | |
| 2 | | | | | | | | | | 1.95 2.00 | | | Firm, dark greenish grey mottled brown, organic, slightly sandy clayey SILT. (LACUSTRINE DEPOSIT with intense offensive smell) |
| 3 | | | 100 | | | | 7 bls | 8 | +0.81 | 3.00 | | | Firm, greyish brown mottled light grey, yellow and red, sandy CLAY with occasional angular to subangular fine gravel sized quartz and highly decomposed meta-siltstone fragments. (ALLUVIUM) |
| 4 | | | | | | | | 9 | | 3.45 | | | |
| | | | 100 | | | | 16 bls | 10 | -0.69 | 4.50 | | | Light grey mottled yellow and red, very clayey/silty fine to coarse SAND with occasional angular to subangular fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| 5 | | | | | | | | 11 | | 4.95 | | | |
| 6 | | | 100 | | | | 22 bls | 12 | -2.19 | 6.00 | | | Firm, red mottled light grey and yellow, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments, (ALLUVIUM) |
| 24/10/2008 | HX 6.45 | 1.20m at 18:00 | | | | | | 13 △ | -2.64 | 6.45 | | | Hole completed at 6.45m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **D.Y. Yip** |
| DATE | **25/10/2008** |
| CHECKED | **James Lu** |
| DATE | **27/10/2008** |

REMARKS
1. Seven bottles of water sample were taken at the depths of 6.45m.

**Site F**

**(2108/XRL/EDH29 to 2108/XRL/EDH32)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.
## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH29**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826840.79 N 833524.63** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **09/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.19** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 09/10/2008 | HX | 08:00 | | | | | | | +13.19 | 0.00 | | | Yellowish brown mottled light grey, silty fine to coarse SAND with some angular to subangular fine gravel sized quartz fragments and some fine to medium gravel sized moderately decomposed tuff fragments. Contains occasional fine to coarse gravel sized concrete fragments. (FILL) |
| | | | 100 | | | | | 1 2 3 INSPECTION PIT | | 0.50 | | | |
| 1 | | | | | | | | | +12.19 | 0.95 1.00 | | | Very stiff, reddish yellow mottled yellow and red, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to medium gravel sized highly decomposed and moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | | 4 5 6 | | 1.50 | | | |
| 2 | | | | | | | | | | 1.95 | | | |
| 3 | | | 100 | | | | 28 blS | 7 | +10.19 | 3.00 | | V | Extremely weak, yellow spotted and mottled light grey and red, completely decomposed, coarse ash TUFF. (Very stiff, sandy SILT with occasional fine gravel) |
| | | | | | | | | 8 | | 3.45 | | | |
| 4 | | | | | | | | | +8.69 | 4.50 | | | |
| | | | 100 | | | | 46 blS | 9 | | | | V | Extremely weak, dark brown mottled light grey, completely decomposed, coarse ash TUFF. (Very stiff, sandy SILT with occasional fine gravel) |
| 5 | | | | | | | | 10 | | 4.95 | | | |
| 6 | | | | | | | | | +7.19 | 6.00 | | | |
| | | | 100 | | | | 27 blS | 11 | | | | V | Extremely weak, yellowish brown spotted and mottled light grey, greenish grey and pink, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, sandy SILT with occasional fine gravel) |
| 09/10/2008 | HX 6.45 | 1.50m at 18:00 | | | | | | 12 △ | +6.74 | 6.45 | | | Hole completed at 6.45m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- V IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **D.Y. Yip** |
| DATE | **10/10/2008** |
| CHECKED | **James Lu** |
| DATE | **11/10/2008** |

REMARKS
1. Six bottles of water sample were taken at a depth of 6.45m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH30**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826809.11 N 833523.04** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **13/10/2008** TO **13/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.06** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 13/10/2008 | HX | 08:00 | | | | | | | +13.06 | 0.00 | | | Very stiff, yellowish brown mottled greyish brown, yellow and red, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and much subangular to subrounded fine to coarse gravel sized highly decomposed and moderately decomposed tuff fragments. (FILL) |
| | | | 100 | | | | | 1 2 3 INSPECTION PIT | +12.56 | 0.50 | | | |
| 1 | | | | | | | | | | 0.95 | | | Very stiff, strong brown, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional angular to subangular fine to medium gravel sized moderately decomposed tuff fragments. (FILL) |
| | | | 100 | | | | | 4 5 6 | | 1.50 | | | |
| 2 | | | | | | | | | | 1.95 | | | |
| 3 | | | | | | | | | +10.06 | 3.00 | | | |
| | | | 75 | | | | 22 bls | 7 8 | | | | | Yellowish brown mottled light greenish grey and red, very clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.45 | | | |
| | | | 100 | | | | 21 bls | 9 10 | +8.56 | 4.50 | | V | Extremely weak, yellowish brown spotted and mottled light grey and red, completely decomposed, coarse ash TUFF. (Very stiff, sandy clayey SILT with occasional fine to coarse gravel) |
| 5 | | | | | | | | | | 4.95 | | | |
| 6 | | | | | | | | | +7.06 | 6.00 | | | |
| 13/10/2008 | HX 6.45 | 0.50m at 18:00 | 100 | | | | 25 bls | 11 12 △ | +6.61 | 6.45 | | V | Extremely weak, light greyish brown spotted white, spotted and mottled dark greenish grey, yellow and red, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, slightly sandy SILT) |
| 7 | | | | | | | | | | | | | Hole completed at 6.45m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **12/10/2008**

CHECKED **James Lu**

DATE **15/10/2008**

REMARKS

1. Six bottles of water sample were taken at the depths of 6.45m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH31**

SHEET 1 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT Contract NEX/2108 Ground Investigation Works for Express Rail Link

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826818.56** **N 833503.99** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **14/10/2008** TO **21/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.13** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15/10/2008 | PX | 08:00 | 100 | | | | | 1 2 3 INSPECTION PIT | +13.13 | 0.00 | | | Firm, brownish yellow, sandy SILT with occasional angular to subangular fine gravel sized quartz fragments. (FILL)<br>From 0.00m to 0.50m : Contains occasional fine to medium gravel sized asphalt fragments. |
| | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | +12.13 | 0.95<br>1.00 | | | Firm, red mottled light grey and yellow, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and some fine to coarse gravel sized highly decomposed and moderately decomposed tuff fragments. (DEBRIS FLOW DEPOSIT) |
| | | | 100 | | | | | 4 5 6 7 | | 1.50 | | | |
| | | | | | | | | | | 1.95<br>2.00 | | | |
| | | | 50 | | | | 50 blows | 8 9 | | 3.00 | | | From 3.00m to 3.45m : With much fine to coarse gravel and occasional cobble sized quartz fragments. |
| | | | | | | | | | | 3.45 | | | |
| | | | 50 | | | | 53 blows | 10 11 | +8.63 | 4.50 | | V | Extremely weak, yellowish brown spotted light grey, white and dark grey, mottled reddish yellow, completely decomposed, coarse ash TUFF. (Very stiff, sandy SILT with occasional fine to medium gravel) |
| | | | | | | | | | | 4.95 | | | |
| | | 0.40m at 18:00 | 100 | | | | 36 blows | 12 13 | +7.13 | 6.00 | | V | Extremely weak, light greyish brown mottled light grey, white, yellowish brown, dark greenish grey and locally red, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, slightly sandy SILT with occasional fine gravel) |
| 15/10/2008<br>16/10/2008 | | 2.05m at 08:00 | | | | | | | | 6.45 | | | |
| | | | 70 | | | | | 14 | | 7.00 | | | |
| | | | | | | | 2,2<br>2,3,3,4<br>N=12 | 15 16 17 | | 8.10<br>8.55 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **22/10/2008**

CHECKED **James Lu**

DATE **23/10/2008**

REMARKS
1. Constant head permeability test was carried out from the depths of 11.00m to 12.50m.
2. Six bottles of water sample were taken at the depths of 43.87m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH31**

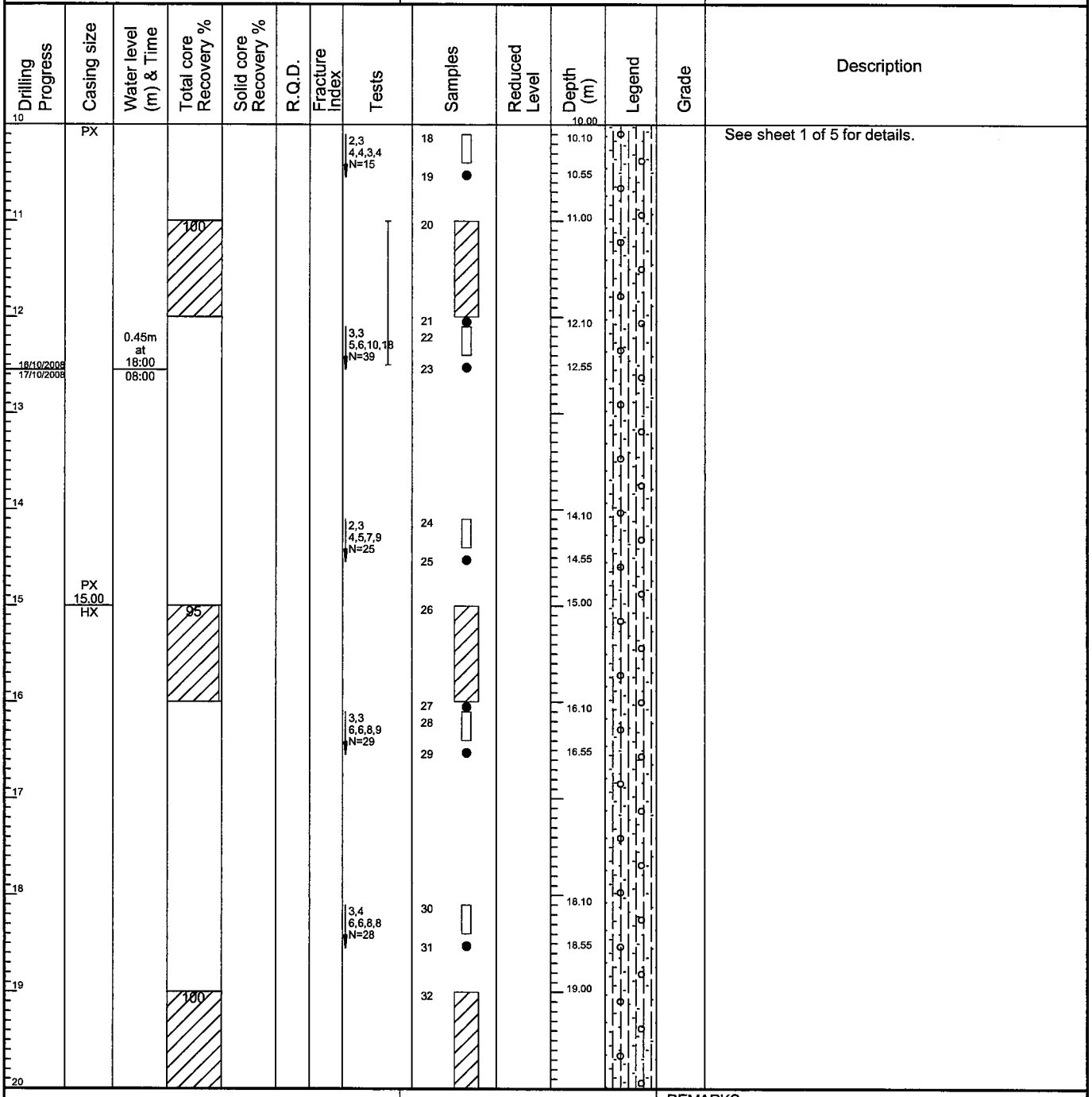
SHEET **2** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826818.56 N 833503.99** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **14/10/2008** TO **21/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.13** mPD |




- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **22/10/2008**

CHECKED **James Lu**

DATE **23/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH31**

SHEET 3 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT Contract NEX/2108 Ground Investigation Works for Express Rail Link

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826818.56** **N 833503.99** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **14/10/2008** TO **21/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.13** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | HX | 0.45m at 18:00 | | | | | 3,5 5,6,7,9 N=27 | 33 34 35 | | 20.00 20.10 20.55 | | | See sheet 1 of 5 for details. |
| 17/10/2008 18/10/2008 | | 2.23m at 08:00 | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | |
| 22 | | | | | | | 3,5 5,6,8,10 N=29 | 36 37 | | 22.10 22.55 | | | |
| 23 | | | 70 | | | | | 38 | | 23.00 | | | |
| 24 | | | | | | | 3,4 6,5,7,9 N=27 | 39 40 41 | | 24.10 24.55 | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | 11,16 24,26,40,10/10mm (100blS/235mm) | 42 43 | | 26.10 26.49 | | | |
| 27 | | | 90 | | | | | 44 | -13.87 | 27.00 | | V | Extremely weak to very weak, light greyish brown spotted and mottled light grey, white and dark greenish grey, porphyritic, completely decomposed, fine grained GRANODIORITE. (Silty sandy fine to coarse GRAVEL with occasional cobble) |
| 28 | | 4.01m at 18:00 | | | | | | | | | | | |
| 18/10/2008 20/10/2008 | | 4.21m at 08:00 | | | | | 50/30mm 100/70mm (100blS/70mm) | 45 46 | | 28.10 28.20 | | | |
| 29 | HX 29.25 | | 100 | 93 | 87 | 6.7 | | T2101 | -16.12 | 29.25 | | III II | Strong, grey spotted and mottled light grey, white, dark greenish grey and locally pink, porphyritic, slightly decomposed, fine grained GRANODIORITE. |
| 30 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **22/10/2008**

CHECKED **James Lu**

DATE **23/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH31**

SHEET **4** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826818.56** **N 833503.99** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **14/10/2008** TO **21/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.13** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | | | | | | | | 30.00 | | | |
| | | | 100 | 95 | 83 | | | T2IOI | | 30.55 | | III II | Joints are medium to widely spaced, locally extremely closely to closely spaced, rough stepped and rough undulating, locally rough planar, extremely narrow, locally very narrow, chlorite infilled, dipping at 20° to 30°, 40° to 50° and 60° to 70°. From 29.25m to 29.40m, 30.20m to 30.26m, 30.60m to 30.75m and 31.86m to 32.01m : Moderately strong, moderately decomposed. |
| 31 | | | | | | | | | | | | | |
| | | | 99 | 91 | 75 | >20 | | T2IOI | | 31.61 | | | |
| 32 | | | | | | 3.9 | | | | | | III II | |
| | | | | | | | | T2IOI | | | | | |
| 33 | | | 100 | 100 | 100 | 1.0 | | | | 33.14 | | | |
| | | | | | | | | T2IOI | | | | | |
| 34 | | | 100 | 100 | 100 | | | | | 34.03 | | | |
| | | | | | | | | T2IOI | | | | | |
| | | | 100 | 100 | 100 | | | | | 34.65 | | | |
| 35 | | | | | | | | T2IOI | | | | | |
| | | | | | | | | | | | | | From 35.49m to 35.62m : With a quartz vein of maximum thickness 70mm dipping at 60° to 70°. |
| 36 | | | 100 | 100 | 98 | | | | | 36.13 | | | |
| | | | | | | | | T2IOI | | | | | |
| 37 | | 2.79m at 18:00 | | | | | | | | | | | |
| 20/10/2008 | | | | | | | | | | | | | |
| 21/10/2008 | | 3.85m at 08:00 | 100 | 100 | 100 | | | T2IOI | | 37.60 | | | |
| 38 | | | | | | | | | | | | | |
| | | | 100 | 100 | 100 | | | | | 38.55 | | | |
| 39 | | | | | | | | T2IOI | | | | | |
| 40 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **22/10/2008**

CHECKED **James Lu**

DATE **23/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH31**

SHEET **5** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826818.56** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | **N 833503.99** | DATE FROM **14/10/2008** TO **21/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.13** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | | | | | | | | | | 40.00 | | | |
| | | | 100 | 100 | 100 | | | | | 40.04 | | | See sheet 4 of 5 for details. |
| 41 | | | | | | 4.3 | | T2IO1 | | | | | |
| | | | 100 | 89 | 78 | | | | | 41.45 | | | |
| 42 | | | | | | 15.4 | | T2IO1 | | | | | |
| | | | | | | 3.1 | | | | | | | |
| 43 | | | 100 | 96 | 96 | | | T2IO1 | | 42.93 | | | |
| 21/10/2008 | | 2.70m at 18:00 | | | | | | 47 | -30.74 | 43.87 | | | |
| 44 | | | | | | | | | | | | | Hole completed at 43.87m. |
| 45 | | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | | |
| 47 | | | | | | | | | | | | | |
| 48 | | | | | | | | | | | | | |
| 49 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **22/10/2008**

CHECKED **James Lu**

DATE **23/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH32**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826828.99** **N 833512.23** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR113** | | DATE FROM **10/10/2008** TO **11/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+13.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 10/10/2008 | HX | 08:00 Dry at 18:00 | | | | | | | +13.18 | 0.00 | | | Yellowish brown mottled brownish grey and locally red, silty fine to coarse SAND with much angular to subangular fine to medium and occasional coarse gravel sized moderately decomposed and slightly decomposed granite and tuff fragments. Contains occasional fine to coarse gravel sized concrete fragment. (FILL) |
| 10/10/2008 11/10/2008 | | Dry at 08:00 | 100 | | | | | 1 2 3 INSPECTION PIT | | 0.50 | | | |
| 1 | | | | | | | | | +12.18 | 0.95 1.00 | | | Very stiff, red mottled light grey and yellow, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and some subangular to subrounded fine to medium and occasional coarse gravel sized highly decomposed and moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | | 4 5 6 | | 1.50 | | | |
| 2 | | | | | | | | | | 1.95 | | | |
| 3 | | | 100 | | | | 17 bls | 7 | +10.18 | 3.00 | | V | Extremely weak, yellowish brown spotted and mottled light grey, white, yellow, red, dark brown and greenish grey, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, sandy SILT with some fine to medium and occasional coarse gravel) |
| | | | | | | | | 8 | | 3.45 | | | |
| 4 | | | | | | | | | | | | | |
| | | | 100 | | | | 55 bls | 9 | | 4.50 | | | |
| 5 | | | | | | | | 10 | | 4.95 | | | |
| 6 | | | | | | | | | +7.18 | 6.00 | | | |
| 11/10/2008 | HX 6.45 | 1.35m at 18:00 | 100 | | | | 28 bls | 11 12 | +6.73 | 6.45 | | V | Extremely weak, greyish brown spotted white, spotted and mottled yellowish brown, red and dark greenish grey, porphyritic, completely decomposed, fine grained GRANODIORITE.(Very stiff, slightly sandy SILT with occasional fine gravel) |
| 7 | | | | | | | | | | | | | Hole completed at 6.45m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **13/10/2008**

CHECKED **James Lu**

DATE **14/10/2008**

REMARKS
1. Six bottles of water sample were taken at the depths of 6.45m.

**Site G**

**(2108/XRL/EDH33 to 2108/XRL/EDH36)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH33**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827153.43** **N 833069.03** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **10/10/2008** TO **11/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.91** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 10/10/2008 | HX | 08:00 | | | | | | | +18.91 | 0.00 | | | Greyish brown mottled yellowish brown, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments. Contains occasional rootlets. (FILL) |
| 1 | | | 100 | | | | | 1 2 3 INSPECTION PIT | +17.91 | 0.50 0.95 1.00 | | | |
| | | | | | | | | | +17.41 | 1.50 | | | Firm, yellowish brown mottled greenish grey and locally reddish yellow, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments. (FILL) |
| 2 | | | 100 | | | | | 4 5 6 | | 1.95 | | | Firm, Yellowish brown mottled yellow, greyish brown and reddish yellow, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and some fine to coarse gravel sized highly decomposed and moderately decomposed tuff fragments. (ALLUVIUM) |
| 3 10/10/2008 | | 0.40m at 18:00 | | | | | | | +15.91 | 3.00 | | | |
| 11/10/2008 | | 0.50m at 08:00 | 100 | | | | 85 bls | 7 8 | | 3.45 | | | Firm, reddish yellow mottled light grey, yellow and red, sandy clayey SILT with occasional angular to subangular fine gravel sized fragments and some fine to medium and occasional coarse gravel sized moderately decomposed and slightly decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | +14.41 | 4.50 | | | |
| 5 | | | 100 | | | | 75 bls | 9 10 | | 4.95 | | | Light brownish grey mottled dark brown and yellowish brown, silty sandy angular to subangular cobbly BOULDER with occasional fine to coarse gravel sized moderately decomposed tuff fragments. (DEBRIS FLOW DEPOSIT) |
| 6 11/10/2008 | HX 6.10 | 18:00 | 87 | | | | | T201 | +12.81 | 5.80 6.10 | | | |
| | | | | | | | | | | | | | Hole completed at 6.10m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **D.Y. Yip** |
| DATE | **13/10/2008** |
| CHECKED | **James Lu** |
| DATE | **14/10/2008** |

REMARKS
1. Six bottles of water sample were taken at the depths of 6.10m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH34**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827127.93 N 833073.67** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **13/10/2008** TO **14/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.67** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 13/10/2008 | HX | 08:00 | | | | | | | +18.67 | 0.00 | | | Greyish brown, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to medium gravel sized moderately decomposed and slightly decomposed granite and tuff fragments. Contains occasional rootlets. (FILL) |
| 1 | | | 100 | | | | | 1 2 3 INSPECTION PIT | | 0.50 | | | |
| | | | | | | | | | | 0.95 | | | |
| | | | | | | | | 4 5 6 | +17.17 | 1.50 | | | Firm, yellowish brown mottled light grey and red, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional subangular to subrounded fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 2 | | | 100 | | | | | | | 1.95 | | | |
| 3 | | | 100 | | | | 68 bls | 7 8 | +15.67 | 3.00 | | | Yellowish brown mottled light grey and red, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to medium gravel sized highly decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.45 | | | |
| | | | 100 | | | | 33 bls | 9 10 | +14.17 | 4.50 | | | Very stiff, yellowish brown mottled light grey, brownish grey, dark brown and red, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and some fine to coarse gravel and occasional cobble sized highly decomposed, moderately decomposed and locally slightly decomposed tuff fragments. (DEBRIS FLOW DRPOSIT) |
| 5 | | | | | | | | | | 4.95 | | | |
| 6 13/10/2008 | | 0.40m at 18:00 | | | | | | | | | | | |
| 14/10/2008 | | 1.45m at 08:00 | 100 | | | | 52 bls | 11 | | 6.00 | | | |
| 14/10/2008 | HX 6.45 | 18:00 | | | | | | 12 △ | +12.22 | 6.45 | | | Hole completed at 6.45m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **15/10/2008**

CHECKED **James Lu**

DATE **16/10/2008**

REMARKS
1. Six bottles of water sample were taken at the depths of 6.45m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.
## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH35**

SHEET 1 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827134.89** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | **N 833065.11** | DATE FROM **18/10/2008** TO **23/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.86** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18/10/2008 | PX | 08:00 | 100 | | | | | 1 2 3 INSPECTION PIT 4 5 6 | +18.86 | 0.00 | | | Greenish grey, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and occasional fine gravel sized highly decomposed and moderately decomposed tuff fragments. Contains occasional dark brown and black decayed wood fragments. (FILL) |
| | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | | 0.95 | | | |
| | | | 100 | | | | | | | 1.50 | | | |
| | | | | | | | | | +16.91 | 1.95 | | | Yellowish brown mottled greenish grey and locally reddish yellow, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments. (FILL with intense offensive smell) |
| | | | | | | | | | +15.86 | 3.00 | | | Red mottled light grey and yellow, clayey/silty sandy angular to subrounded fine to coarse GRAVEL sized moderately decomposed tuff fragments. (DEBRIS FLOW DEPOSIT) |
| | | | 100 | | | | 77 bls | 7 8 | | 3.45 | | | |
| | | | | | | | | | +14.36 | 4.50 | | | Dense, yellowish brown mottled brownish grey and locally red and dark grey, silty sandy subangular to rounded fine to coarse GRAVEL with occasional cobble sized moderately decomposed tuff fragments. (DEBRIS FLOW DEPOSIT) |
| | | | 0 | | | | 111 bls | 9 | | 4.95 | | | |
| | | 0.40m at 18:00 | 0 | | | | 100 bls | 10 | | 6.00 | | | |
| 18/10/2008 20/10/2008 | | 1.00m at 08:00 | | | | | | | | 6.45 | | | |
| | | | 50 | | | | | T2101 | | 7.00 | | | |
| | | | 0 | | | | | | | 7.50 | | | |
| | | | | | | | | 11 12 | | 8.60 | | | |
| | | | 25 | | | | | | | | | | |
| | | | | | | | 10,10 9,9,8,9 | 13 14 | | 9.70 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **24/10/2008**

CHECKED **James Lu**

DATE **25/10/2008**

REMARKS
1. Acoustic televiewer survey was carried out from the depths of 28.18m to 41.88m.
2. Packer tests were carried out from the depths of 34.50m to 38.50m and 38.50m to 42.03m.
3. Seven bottles of water sample were taken at the depths of 42.03m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.
## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH35**

SHEET **2** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827134.89** **N 833065.11** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **18/10/2008** TO **23/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.86** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | PX | | | | | | N=35 | 15 | | 10.00 | | | See sheet 1 of 5 for details. |
| | | | | | | | | | +8.26 | 10.15 | | | |
| | | | 100 | | | | | 16 | | 10.60 | | V | Extremely weak, greenish grey spotted and mottled light grey, white, yellow and dark greenish grey, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, slightly sandy SILT with occasional fine gravel) |
| 11 | | | | | | | | 17 | | 11.70 | | | |
| | | | | | | | 2,2 2,3,3,3 N=11 | 18 | | | | | |
| 12 | | | | | | | | 19 | | 12.15 | | | |
| 13 | | | | | | | | | | | | | |
| | | | | | | | 3,5 7,8,10,11 N=36 | 20 | | 13.70 | | | |
| 14 | | | | | | | | 21 | | 14.15 | | | |
| | PX 14.60 HX | | | | | | | 22 | | 14.60 | | | |
| 15 | | | 100 | | | | | | | | | | |
| | | | | | | | | 23 | | 15.70 | | | |
| | | | | | | | 2,5 6,9,10,15 N=40 | 24 | | | | | |
| 16 | | | | | | | | 25 | | 16.15 | | | |
| 17 | | | | | | | | | | | | | |
| | | 0.40m at 18:00 | | | | | 4,6 8,9,13,17 N=47 | 26 | | 17.70 | | | |
| 18 | 20/10/2008 21/10/2008 | 1.00m at 08:00 | | | | | | 27 | | 18.15 | | | |
| | | | | | | | | 28 | | 18.60 | | | |
| 19 | | | 95 | | | | | | | | | | |
| | | | | | | | | 29 | | 19.70 | | | |
| 20 | | | | | | | 3,6 8,12,12,20 | 30 | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **24/10/2008**

CHECKED **James Lu**

DATE **25/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.
## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH35**

SHEET **3** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827134.89** **N 833065.11** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **18/10/2008** TO **23/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.86** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | HX | | | | | | N=52 | 31 | | 20.00 / 20.15 | | | See sheet 2 of 5 for details. |
| 21 | | | | | | | | | | | | | |
| 22 | | | | | | | 5,9 9,11,13,19 N=52 | 32 / 33 | | 21.70 / 22.15 | | | |
| 23 | | | 100 | | | | | 34 | | 22.60 | | | |
| | | | | | | | | 35 | -4.84 | 23.70 | | V | Extremely weak to very weak, greenish grey spotted dark greenish grey, spotted and mottled light grey, white and yellow, porphyritic, completely decomposed, fine grained GRANODIORITE. (Very stiff, sandy SILT with occasional fine gravel) |
| 24 | | | | | | | 11,19 25,27,48/30mm (100bls/180mm) | 36 / 37 | | 24.03 | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | 15,30 51,49/25mm (100bls/100mm) | 38 / 39 | | 25.70 / 25.95 | | | |
| | | | | | | | | | -7.74 | 26.60 | | V | Extremely weak to very weak, greenish grey spotted and mottled light grey, white, yellow and dark greenish grey, porphyritic, completely decomposed, fine grained GRANODIORITE. (Silty sandy fine to coarse GRAVEL) |
| 27 | | | 90 | | | | | 40 | | | | | |
| 28 | HX 27.95 | | | | | | 50/30mm 100/50mm (100bls/50mm) | 41 / 42 | -9.09 | 27.70 / 27.78 / 27.95 | | IV | Weak to moderately weak, locally very weak, brownish grey spotted dark greenish grey, spotted and mottled light grey and white, mottled yellowish brown, highly decomposed, porphyritic, fine grained GRANODIORITE. Joints are very closely to closely spaced, locally extremely closely spaced, rough stepped and rough undulating, extremely narrow to very narrow, iron and manganese oxide stained, dipping at 10° to 20° and 20° to 30°, locally 80° to 90°. From 29.51m to 29.75m : No core recovered. |
| | | 0.50m at 18:00 | 100 | 94 | 41 | 15.6 | | T2IOI | | | | | |
| 29 21/10/2008 22/10/2008 | | 1.30m at 08:00 | 81 | 41 | 0 | >20 / 13.3 | | T2IOI | | 28.85 | | | |
| | | | | | | NI | | | -10.65 | 29.51 | | V | |
| | | | | | | NR | | | -10.89 | 29.75 | | IV | |
| 30 | | | | | | >20 | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **D.Y. Yip** |
| DATE | **24/10/2008** |
| CHECKED | **James Lu** |
| DATE | **25/10/2008** |

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH35**

SHEET **4** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827134.89** **N 833065.11** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **18/10/2008** TO **23/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.86** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | | | | | | | | 30.00 | | | |
| | | | 100 | 55 | 8 | | | | | 30.20 | | | assumed to be completely decomposed granodiorite. From 29.75m to 30.68m : With 80° to 90° joints where incipient from 30.29m to 30.68m. |
| | | | | | | | | | -11.82 | 30.68 | | III | Moderately strong, brownish grey spotted and mottled light grey, white and dark greenish grey, porphyritic, moderately decomposed, fine grained GRANODIORITE. Joints are very closely to closely spaced, locally medium spaced, rough stepped and rough undulating, extremely narrow to very narrow, iron and manganese oxide stained, dipping at 20° to 30°, 40° to 50° and 60° to 70°, locally 0° to 10° and 80° to 90°. From 30.68m to 31.81m : With an 80° to 90° joint. From 32.79m to 33.24m : With an 80° to 90° joint. |
| 31 | | | | | | | | T2101 | | | | | |
| | | | 100 | 65 | 32 | 11.1 | | | | 31.70 | | | |
| 32 | | | | | | >20 | | | | | | | |
| | | | | | | 4.3 | | T2101 | | | | | |
| | | | | | | >20 | | | | | | | |
| 33 | | | | | | | | | | 33.09 | | | |
| | | | 100 | 92 | 61 | 7.0 | | | -14.38 | 33.24 | | II | Strong, grey spotted and mottled light grey, white, dark greenish grey and locally pink, porphyritic, slightly decomposed, fine grained GRANODIORITE. Joints are medium to widely spaced, locally very closely to closely spaced, rough stepped and rough undulating, extremely narrow, locally very narrow, iron and manganese oxide stained, calcite and chlorite infilled, dipping at 20° to 30°, 40° to 50° and 60° to 70°, locally 80° to 90 From 33.24m to 33.87m : With an 80° to 90° joint. From 34.19m to 34.26m : Moderately strong, moderately decomposed. |
| 34 | | | | | | | | T2101 | | | | | |
| | | | | | | 1.4 | | | | 34.53 | | | |
| | | | 100 | 100 | 100 | | | | | | | | |
| 35 | | | | | | | | T2101 | | | | | |
| | | 0.60m at 18:00 | | | | | | | | | | | |
| 36 | | | | | | | | | | 36.02 | | | |
| | 22/10/2008 23/10/2008 | 1.80m at 08:00 | 100 | 100 | 100 | | | T2101 | | | | | |
| 37 | | | | | | | | | | | | | |
| | | | 100 | 99 | 94 | | | | | 37.50 | | | From 37.36m to 38.45m : With 80° to 90° joints where incipient from 37.36m to 37.75m. |
| 38 | | | | | | >20 | | | | | | | |
| | | | | | | 3.7 | | T2101 | | | | | |
| 39 | | | | | | | | | | 39.00 | | | |
| | | | 100 | 100 | 89 | 11.5 | | | | | | | From 39.14m to 39.50m : With an 80° to 90° joint. |
| | | | | | | 2.7 | | T2101 | | | | | |
| 40 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **24/10/2008**

CHECKED **James Lu**

DATE **25/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH35**

SHEET **5** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827134.89 N 833065.11** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | | DATE FROM **18/10/2008** TO **23/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.86** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | | | | | | | | | | 40.00 | | | |
| 41 | | | 100 | 100 | 93 | | | T2IO1 | | 40.47 | | | |
| | | | 100 | 67 | 15 | 15.1 | | T2IO1 | | 41.15 | | | From 41.05m to 41.71m : With 80° to 90° joints where incipient from 41.05m to 41.15m. |
| 42 | 23/10/2008 | 18:00 | | | | | | T2IO1 | -23.17 | 42.03 | | | At 41.80m : With slickensided planar fracture dipping at 70°. Hole completed at 42.03m. |
| 43 | | | | | | | | | | | | | |
| 44 | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | | |
| 47 | | | | | | | | | | | | | |
| 48 | | | | | | | | | | | | | |
| 49 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **24/10/2008**

CHECKED **James Lu**

DATE **25/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH36**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 827157.82** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR127** | **N 833052.49** | DATE FROM **15/10/2008** TO **16/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+18.88** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | +18.88 | 0.00 | | | |
| 15/10/2008 | HX | 08:00 | 100 | | | | | 1 2 3 INSPECTION PIT | +17.93 | 0.50 0.95 | | | Firm, greyish brown mottled yellowish brown, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments. (FILL) |
| 1 | | | | | | | | | | | | | |
| | | | 100 | | | | | 4 5 6 | | 1.50 1.95 | | | Firm, yellow brown mottled light grey and red, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and some subangular to subrounded fine to medium and occasional coarse gravel sized highly decomposed and moderately decomposed tuff fragments. (ALLUVIUM) |
| 2 | | | | | | | | | | | | | |
| 3 15/10/2008 | | Dry at 18:00 | | | | | | | | | | | |
| 16/10/2008 | | Dry at 08:00 | 100 | | | | 47 bls | 7 8 | | 3.00 3.45 | | | |
| 4 | | | | | | | | | | | | | |
| | | | 100 | | | | 48 bls | 9 10 | +14.38 | 4.50 4.95 | | | Reddish yellow mottled dark brown and locally light grey, clayey/silty fine to coarse SAND with much subangular to subrounded fine to coarse gravel sized moderately decomposed tuff fragments. (DEBRIS FLOW DEPOSIT) |
| 5 | | | | | | | | | | | | | |
| 6 | | | 0 | | | | 72 bls | | | 6.00 | | | |
| 16/10/2008 | HX 6.45 | 18:00 | | | | | | 11 △ | +12.43 | 6.45 | | | From 6.40m to 6.45m : With much fine to coarse gravel sized quartz fragments. |
| 7 | | | | | | | | | | | | | Hole completed at 6.45m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **17/10/2008**

CHECKED **James Lu**

DATE **18/10/2008**

REMARKS

1. Six bottles of water sample were taken at the depths of 6.45m.

**Site S**

**(2108/XRL/EDHS-01 to 2108/XRL/EDHS-02)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHS01**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 826637.43 N 833868.80** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR112** | | DATE FROM **10/01/2009** TO **12/01/2009** |
| FLUSHING MEDIUM | | ORIENTATION **Vertical** | GROUND LEVEL **+10.79** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 10/01/2009 | HX | 08:00 | | | | | | | +10.79 | 0.00 | | | Firm, dark greyish brown, locally mottled yellowish brown, organic, sandy SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to medium gravel sized moderately decomposed tuff fragments. Contains much rootlets and occasional fine gravel sized charcoal fragments. (FILL) |
| | | | 0 | | | | | 1 2 3 INSPECTION PIT | | 0.50 | | | |
| 1 | | | | | | | | | +9.79 | 1.00 | | | Firm, yellow brown, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and fine to medium gravel sized moderately decomposed tuff fragments. |
| | | Dry at 18:00 | 0 | | | | | 4 5 6 | | 1.50 | | | |
| 2 10/01/2009 12/01/2009 | | Dry at 08:00 | | | | | | | | 1.95 | | | |
| 3 | | | 100 | | | | 30 blows | 7 8 | +7.79 | 3.00 | | | Greenish grey mottled yellowish brown, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and some fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.45 | | | |
| | | | 100 | | | | 76 blows | 9 10 | +6.29 | 4.50 | | | Greenish grey mottled yellowish brown and dark grey, clayey/silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized quartz and moderately decomposed tuff fragments. (ALLUVIUM) |
| 5 | | | | | | | | | | 4.95 | | | |
| 6 | | | 100 | | | | 41 blows | 11 | | 6.00 | | | |
| 12/01/2009 | HX 6.45 | 18:00 | | | | | | 12 △ | +4.34 | 6.45 | | | Hole completed at 6.45m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **13/01/2009**

CHECKED **James Lu**

DATE **14/01/2009**

REMARKS

1. Six bottles of water sample were taken at the depths of 6.45m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHS02**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826637.05** **N 833863.39** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR112** | | DATE FROM **10/01/2009** TO **12/01/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+10.69** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 10/01/2009 | HX | 08:00 | | | | | | | +10.69 | 0.00 | | | |
| 1 | | | 0 | | | | | 1 2 3 INSPECTION PIT | +9.69 | 0.50 1.00 | | | Firm, dark greyish brown, locally mottled yellowish brown, organic, sandy SILT with occasional angular to subangular fine gravel sized quartz fragments and occasional fine to medium gravel sized moderately decomposed tuff fragments. Contains occasional rootlets and occasional fine gravel sized charcoal fragments. (FILL) |
| 2 10/01/2009 13/01/2009 | | Dry at 18:00 Dry at 08:00 | 0 | | | | | 4 5 6 | | 1.95 | | | Firm , yellowish brown, sandy clayey SILT with occasional angular to subangular fine gravel sized quartz fragments and fine to medium gravel sized moderately decomposed and slightly decomposed tuff fragments. Contains occasional rootlets. (ALLUVIUM) |
| 3 | | | 100 | | | | 42 bls | 7 8 | +7.69 | 3.00 3.45 | | | Yellowish brown, clayey/silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments and fine to coarse gravel sized moderately decomposed and slightly decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | +6.19 | 4.50 | | | |
| 5 | | | 100 | | | | 77 bls | 9 10 | | 4.95 | | | Greenish grey spotted light grey, dark grey and white, locally mottled yellowish brown and dark grey, silty fine to coarse SAND with occasional angular to subangular fine gravel sized quartz fragments. (ALLUVIUM) From 4.90m to 4.95m : With much fine to medium gravel sized quartz and moderately decomposed and slightly decomposed tuff fragments. |
| 6 | | | 100 | | | | 46 bls | 11 | | | | | |
| 13/01/2009 | HX 6.45 | 18:00 | | | | | | 12 △ | +4.24 | 6.45 | | | Hole completed at 6.45m. |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **13/01/2009**

CHECKED **James Lu**

DATE **14/01/2009**

REMARKS
1. Six bottles of water sample were taken at the depths of 6.45m.

**Site Q**

**(2108/XRL/EDHQ-01 to 2108/XRL/EDHQ-05)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHQ01**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826683.81** **N 833756.37** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR122** | | DATE FROM **17/02/2009** TO **17/02/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+11.63** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17/02/2009 | PX | 08:00 | | | | | | | +11.63 | 0.00 | | | Firm, reddish brown, spotted white, sandy clayey SILT with some angular fine to coarse gravel sized moderately decomposed tuff fragments. (FILL) |
| | | | 100 | | | | | 1 | | 0.50 | | | |
| 1 | | | 100 | | | | | 2 INSPECTION PIT | | 0.95 | | | From 0.95m to 1.50m : Greyish brown. |
| | | | 100 | | | | | 3 | +10.13 | 1.50 | | | Stiff, light yellowish brown, spotted white, sandy clayey SILT with occasional subangular fine to medium gravel sized highly decomposed tuff ash fine gravel sized quartz fragments. (ALLUVIUM) |
| 2 | | | 100 | | | | | 4 | | 1.95 | | | |
| | | | | | | | | | | 2.40 | | | |
| | PX 3.00 | | | | | | | | | | | | |
| 3 | HX | | 75 | | | | 16 bls | 5 | | 3.00 | | | |
| | | | 100 | | | | 65 bls | 6 | +8.18 | 3.45 | | | Reddish brown, spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.90 | | | |
| | | | 0 | | | | 100 bls | 7 | | 4.50 | | | From 4.50m to 4.95m : No core recovered. |
| 5 | | | 89 | | | | 55 bls | 8 | | 4.95 | | | From 4.95m to 5.40m : Light yellowish brown. |
| | | | 100 | | | | 34 bls | 9 | +6.23 | 5.40 | | | Dark yellowish brown, spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 6 | | | 100 | | | | 35 bls | 10 | +5.78 | 5.85 | | V | |
| 17/02/2009 | HX 6.30 | 18:00 | | | | | | | +5.33 | 6.30 | | | Extremely weak, dark brown, spotted and mottled white, completely decomposed porphyritic, fine grained GRANODIORITE. (Stiff, sandy SILT) |
| 7 | | | | | | | | | | | | | Hole completed at 6.30m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **18/02/2009**

CHECKED **James Lu**

DATE **19/02/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHQ02**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826688.32** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR122** | **N 833772.40** | DATE FROM **12/02/2009** TO **14/02/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+11.77** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 12/02/2009 | PX | 08:00 | 100 | | | | | 1 | +11.77 | 0.00 | | | Firm, brown spotted white, sandy clayey SILT with some angular fine to coarse gravel sized moderately decomposed tuff fragments. (FILL) |
| 1 | | | 100 | | | | | 2 INSPECTION PIT | | 0.50 | | | |
| | | | 100 | | | | | 3 | | 0.95 | | | |
| | | | | | | | | | +10.27 | 1.40 1.50 | | | Stiff, yellowish brown spotted white, sandy clayey SILT with occasional subangular fine to medium gravel sized highly decomposed tuff and quartz fragments. (ALLUVIUM) |
| 2 | | | 100 | | | | | 4 | | 1.95 | | | |
| 12/02/2009 | | Dry at 18:00 | | | | | | | | 2.40 | | | |
| 14/02/2009 | | Dry at 08:00 | | | | | | | +8.77 | 3.00 | | | |
| 3 | | | 50 | | | | 35 blS | 5 | +8.32 | 3.45 | | | Reddish brown spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | 67 blS | | | | | | |
| 4 | | | | | | | | 6 | | 3.90 | | | Yellowish brown spotted white, clayey silty fine to coarse SAND with some subangular fine to medium gravel sized moderately decomposed and quartz fragments. (FILL) |
| | | | 0 | | | | 39 blS | 7 | | 4.50 | | | From 4.50m to 4.95m : No core recovered. |
| 5 | | | 50 | | | | 76 blS | | +6.82 | 4.95 | | | |
| | | | 100 | | | | 61 blS | 8 9 | | 5.40 | | | Light yellowish brown spotted white, clayey silty fine to coarse SAND with occasional subangular fine to medium gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| 6 | | | 100 | | | | 56 blS | | +5.92 | 5.85 | | V | From 5.40m to 5.85m : Dark yellowish brown with some subangular fine to coarse gravel. |
| 14/02/2009 | PX 6.30 | Dry at 18:00 | | | | | | 10 | +5.47 | 6.30 | | | Extremely weak, greyish brown spotted and mottled white, completely decomposed porphyritic, fine grained GRANODIORITE. (Stiff, sandy SILT) |
| 7 | | | | | | | | | | | | | Hole completed at 6.30m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **16/02/2009**

CHECKED **James Lu**

DATE **17/02/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHQ03**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826674.48** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR112** | **N 833778.64** | DATE FROM **12/02/2009** TO **13/02/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+11.77** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 12/02/2009 | PX | 08:00 | | | | | | | +11.77 | 0.00 | | | Firm, reddish brown spotted white, sandy clayey SILT with some angular fine to medium gravel sized moderately decomposed tuff fragments. (FILL) |
| 1 | | | 100 | | | | | 1 | | 0.50 | | | |
| | | | 100 | | | | | 2 INSPECTION PIT | | 0.95 | | | |
| | | | 100 | | | | | 3 | +10.27 | 1.40 1.50 | | | Stiff, greyish brown spotted white, sandy clayey SILT with occasional subangular fine to medium gravel sized quartz fragments. (COLLUVIUM) |
| 2 12/02/2009 | | Dry at 18:00 | 100 | | | | | 4 | | 1.95 | | | |
| 13/02/2009 | | Dry at 08:00 | | | | | | | | 2.40 | | | |
| 3 | | | 40 | | | | 34 bls | 5 | +8.77 | 3.00 | | | Brownish grey spotted white, slightly clayey silty fine to coarse SAND with some subangular fine to medium gravel sized moderately decomposed occasional quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 57 bls | | +8.32 | 3.45 | | | |
| 4 | | | | | | | | 6 | | 3.90 | | | Light yellowish brown spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| | | | 0 | | | | 33 bls | 7 | | 4.50 | | | From 4.50m to 6.00m : Brownish brown. |
| 5 | | | 100 | | | | 18 bls | | | 4.95 | | | |
| | | | | | | | | 8 | | 5.40 | | | |
| 6 | | | 80 | | | | 73 bls | 9 | +5.77 | 6.00 | | | Dark yellowish brown spotted white, clayey silty fine to coarse SAND with some subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | 50 bls | | +5.32 | 6.45 | | V | |
| 13/02/2009 | PX 6.90 | Dry at 18:00 | | | | | | 10 | +4.87 | 6.90 | | | Extremely weak, light yellowish brown spotted and mottled white, completely decomposed porphyrite, fine grained GRANODIORITE. (Stiff, sandy SILT) |
| 7 | | | | | | | | | | | | | Hole completed at 6.90m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **14/01/2009**

CHECKED **James Lu**

DATE **16/02/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHQ04**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826664.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR122** | **N 833765.61** | DATE FROM **17/02/2009** TO **17/02/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+11.80** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17/02/2009 | PX | 08:00 | 100 | | | | | 1 | | 0.00 | | | Firm, reddish brown spotted white, sandy clayey SILT with some angular fine to coarse gravel sized moderately decomposed tuff fragments. (FILL) |
| | | | 100 | | | | | 2 INSPECTION PIT | | 0.50 | | | |
| | | | 100 | | | | | 3 | | 0.95 | | | From 1.50m to 1.95m : Brownish grey. |
| | | | 100 | | | | | 4 | +9.85 | 1.40 | | | Stiff, greyish brown spotted white, sandy clayey SILT with occasional subangular fine to medium gravel sized highly decomposed tuff and quartz fragments. (ALLUVIUM) |
| | | | 56 | | | | 14 bls | 5 | | 1.95 | | | |
| | | | 100 | | | | 32 bls | | +8.35 | 2.40 | | | From 3.00m to 3.45m : Yellowish brown. |
| | | | | | | | | 6 | | 3.00 | | | Brownish grey spotted white, clayey silty fine to coarse SAND with occasional subangular fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| | | | 0 | | | | 28 bls | 7 | +6.85 | 3.45 | | | |
| | | | 34 | | | | 28 bls | | | 3.90 | | | |
| | | | 100 | | | | 12 bls | 8 | +6.40 | 4.50 | | | Brownish grey spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | 72 bls | 9 | | 4.95 | | | |
| | | | 100 | | | | 13 bls | 10 | +5.50 | 5.40 | | | Stiff, dark yellowish brown spotted white, clayey silty fine to coarse SAND with some subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| | | | 100 | | | | 18 bls | 11 | | 5.85 | | | |
| 17/02/2009 | PX 7.20 | Dry at 18:00 | | | | | | 12 | +4.60 | 6.30 | | | Extremely weak, yellowish brown spotted and mottled white, completely decomposed porphyritic, fine grained GRANODIORITE. (Stiff, sandy SILT) |
| | | | | | | | | | | 6.75 | | | From 6.75m to 7.20m : Light yellowish brown. |
| | | | | | | | | | | 7.20 | | | Hole completed at 7.20m. |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **18/02/2009**

CHECKED **James Lu**

DATE **19/02/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHQ05**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826654.64** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR122** | **N 833769.27** | DATE FROM **18/02/2009** TO **18/02/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+11.70** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 18/02/2009 | PX | 08:00 | | | | | | | +11.70 | 0.00 | | | Firm, reddish brown, spotted white, sandy clayey SILT with some angular fine to medium gravel sized moderately decomposed tuff fragments. (FILL) |
| 1 | | | 100 | | | | | 1 | | 0.50 | | | |
| | | | 100 | | | | | 2 INSPECTION PIT | | 0.95 | | | From 0.95m to 1.50m : Brownish red. |
| | | | 100 | | | | | 3 | +10.20 | 1.50 | | | Stiff, yellowish brown, spotted white, sandy clayey SILT with occasional subangular fine to medium gavel sized highly decomposed tuff and quartz fragments. (ALLUVIUM) |
| 2 | | | 100 | | | | | 4 | | 1.95 | | | From 1.50m to 1.95m : Brownish grey. |
| | PX 2.40 | | | | | | | | | 2.40 | | | |
| | HX | | | | | | | | | | | | |
| 3 | | | 75 | | | | 18 bls | 5 | | 3.00 | | | |
| | | | 100 | | | | 48 bls | 6 | +8.25 | 3.45 | | | Brownish grey, spotted white, clayey silty fine to coarse SAND with much subangular to subrounded fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.90 | | | |
| | | | 0 | | | | 61 bls | 7 | | 4.50 | | | |
| 5 | | | 100 | | | | 38 bls | 8 | +6.75 | 4.95 | | | Soft to fine, light yellowish brown, spotted white, sandy silty CLAY. (ALLUVIUM) |
| | | | 100 | | | | 77 bls | 9 | +6.30 | 5.40 | | | Yellowish brown, spotted white, clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff fragments. (ALLUVIUM) |
| 6 | | | 100 | | | | 49 bls | 10 | | 5.85 | | | |
| | | | 100 | | | | 74 bls | 11 | | 6.30 | | | From 6.30m to 6.75m : Light yellowish brown. |
| | | | 100 | | | | 52 bls | 12 | +4.95 | 6.75 | | V | |
| 7 18/02/2009 | HX 7.20 | 18:00 | | | | | | | +4.50 | 7.20 | | | Extremely weak, light greyish brown, spotted and mottled white, completely decomposed porphyritic, fine grained GRANODIORITE. (Stiff, sandy SILT) |
| | | | | | | | | | | | | | Hole completed at 7.20m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **19/02/2009**

CHECKED **James Lu**

DATE **20/02/2009**

REMARKS

**Site M**

**(2108/XRL/EDHM01 to 2108/XRL/EDHM04)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHM01**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826718.54** **N 833696.62** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR136** | | DATE FROM **17/03/2009** TO **20/03/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+13.70** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 17/03/2009 | PX | 08:00 | | | | | | 1 2 3 4 INSPECTION PIT | +13.70 | 0.00 | | | Firm, yellowish brown spotted white, sandy clayey SILT with occasional angular fine to medium gravel sized highly decomposed tuff fragments. (ALLUVIUM) |
| 1 | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | | 1.00 | | | |
| | | | | | | | | | +12.20 | 1.50 | | | Firm to stiff, brownish yellow spotted white, sandy clayey SILT with occasional angular fine gravel sized quartz fragments. (ALLUVIUM) |
| 2 17/03/2009 | | Dry at 18:00 | | | | | | | | | | | |
| 20/03/2009 | | Dry at 08:00 | | | | | | | | 2.00 | | | |
| 3 | | | 100 | | | | 89 blS | 5 | +10.70 | 3.00 | | | Stiff, reddish yellow spotted white, striped red, sandy clayey SILT. (ALLUVIUM) |
| | | | 100 | | | | 94 blS | 6 | | | | | |
| 4 | | | | | | | | | | 3.90 | | | |
| | | | 100 | | | | 54 blS | 7 | +9.20 | 4.50 | | | Stiff, yellowish red spotted and dappled light grey, sandy clayey SILT with some subangular fine to coarse gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| 5 | | | 100 | | | | 74 blS | 8 | | | | | |
| | | | | | | | | | | 5.40 | | | |
| 6 | | | 100 | | | | 16 blS | 9 | +7.70 | 6.00 | | V | Extremely weak, yellowish red spotted white, completely decomposed, coarse ash crystal TUFF. (Stiff, sandy clayey SILT with occasional fine to medium gravel) |
| | | | 100 | | | | 35 blS | 10 | | | | | |
| 20/03/2009 | PX 6.90 | Dry at 18:00 | | | | | | | +6.80 | 6.90 | | | |
| 7 | | | | | | | | | | | | | Hole completed at 6.90m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **21/03/2009**

CHECKED **James Lu**

DATE **23/03/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHM02**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826735.99 N 833694.01** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR136** | | DATE FROM **20/03/2009** TO **23/03/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+13.78** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 20/03/2009 | PX | 08:00 | | | | | | 1 2 3 INSPECTION PIT 4 | +13.78 | 0.00 | | | Firm, yellowish brown spotted white, sandy clayey SILT with occasional angular fine to medium gravel sized highly decomposed and moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| 1 | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | | 1.00 | | | |
| | | Dry at 18:00 | | | | | | | +12.28 | 1.50 | | | Stiff, brownish yellow spotted white, sandy clayey SILT with occasional angular fine to medium gravel sized highly decomposed tuff fragments. (ALLUVIUM) |
| 2 20/03/2009 23/03/2009 | | Dry at 08:00 | | | | | | | | 2.00 | | | |
| 3 | | | 100 | | | | 108 blows | 5 | +10.78 | 3.00 | | | Yellowish brown spotted white, slightly clayey silty fine to coarse SAND with much subangular fine to coarse gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 141 blows | 6 | +10.33 | 3.45 | | | Stiff, light yellowish brown spotted white, sandy clayey SILT with some subangular to subrounded fine to coarse gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| 4 | | | | | | | | | | 3.90 | | | |
| | | | 100 | | | | 95 blows | 7 | | 4.50 | | | |
| 5 | | | 100 | | | | 67 blows | 8 | +8.83 | 4.95 | | | Stiff, reddish yellow spotted and dappled light grey, sandy clayey SILT with some subangular to subrounded fine to medium gravel sized moderately decomposed tuff and quartz fragments. (ALLUVIUM) |
| | | | | | | | | | | 5.40 | | | |
| 6 | | | 100 | | | | 24 blows | 9 | | 6.00 | | | From 6.00m to 6.45m : Yellowish brown with some fine to coarse gravel. |
| | | | 100 | | | | 23 blows | | +7.33 | 6.45 | | | |
| 7 23/03/2009 | PX 6.90 | Dry at 18:00 | | | | | | 10 | +6.88 | 6.90 | | V | Extremely weak, yellowish brown spotted white, completely decomposed, coarse ash crystal TUFF. (Stiff, sandy clayey SILT) |
| | | | | | | | | | | | | | Hole completed at 6.90m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **24/03/2009**

CHECKED **James Lu**

DATE **25/03/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHM03**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826726.68** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR136** | **N 833713.82** | DATE FROM **19/03/2009** TO **21/03/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+13.63** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19/03/2009 | PX | 08:00 | | | | | | | +13.63 | 0.00 | | | |
| | | | | | | | | 1 | +13.13 | 0.50 | | | Firm, greyish brown to black spotted white sandy clayey SILT with occasional angular fine to medium gravel sized moderately decomposed granite fragments. (FILL) |
| | | | | | | | | 2 INSPECTION PIT | | 1.00 | | | Stiff, greenish grey spotted white, sandy clayey SILT with occasional subangular fine gravel sized quartz fragments. (ALLUVIUM) |
| | | | | | | | | 3 | | 1.50 | | | |
| | | | | | | | | 4 | +11.63 | 2.00 | | | |
| | | Dry at 18:00 | | | | | | | | | | | Stiff, yellowish brown spotted white, sandy clayey SILT with occasional subangular fine gravel sized quartz fragments. (ALLUVIUM) |
| 19/03/2009 | | | | | | | | 5 | | 2.50 | | | |
| 21/03/2009 | | Dry at 08:00 | | | | | | | +10.63 | 3.00 | | | |
| | | | 78 | | | | 22 bls | 6 | | | | | Dark, yellowish brown spotted white, slightly clayey silty fine SAND with occasional subangular fine gravel sized quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 28 bls | | +10.18 | 3.45 | | | |
| | | | | | | | | 7 | | 3.90 | | | Stiff, reddish yellow spotted white, striped red, sandy clayey SILT. (ALLUVIUM) |
| | | | | | | | | | +9.13 | 4.50 | | | |
| | | | 89 | | | | 39 bls | 8 | | | | | Dark brownish grey spotted white, silty fine to coarse SAND with occasional subangular fine to medium gravel sized fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 91 bls | | | | | | From 4.50m to 4.95m : Greyish brown. |
| | | | | | | | | 9 | | 5.40 | | | |
| | | | | | | | | | +7.63 | 6.00 | | | |
| | | | 78 | | | | 19 bls | 10 | | | | | Reddish yellow spotted white, striped red, clayey silty fine to coarse SAND with occasional subangular fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 49 bls | | +7.18 | 6.45 | | V | |
| 21/03/2009 | PX 6.90 | Dry at 18:00 | | | | | | 11 | +6.73 | 6.90 | | | Extremely weak, yellowish brown spotted white, completely decomposed, coarse ash crystal TUFF. (Stiff, sandy clayey SILT with some fine to coarse gravel) |
| | | | | | | | | | | | | | Hole completed at 6.90m. |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **23/03/2009**

CHECKED **James Lu**

DATE **24/03/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDHM04**

SHEET 1 OF 1

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 826739.09 N 833715.61** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR136** | | DATE FROM **23/03/2009** TO **24/03/2009** |
| FLUSHING MEDIUM | ORIENTATION **Vertical** | GROUND LEVEL **+13.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 23/03/2009 | PX | 08:00 | | | | | | 1 2 3 4 INSPECTION PIT | +13.74 | 0.00 | | | Stiff, yellowish brown spotted white, sandy clayey SILT with occasional subangular fine gravel sized quartz fragments. (ALLUVIUM) From 0.50m to 2.00m : Brownish yellow. |
| 1 | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | | 1.00 | | | |
| | | | | | | | | | | 1.50 | | | |
| 2 23/03/2009 | | Dry at 18:00 | | | | | | | | 2.00 | | | |
| 24/03/2009 | | Dry at 08:00 | | | | | | | | | | | |
| 3 | | | 78 | | | | 27 bls | 5 | +10.74 | 3.00 | | | Dark yellowish brown spotted white, silty fine to coarse SAND with occasional subangular fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 52 bls | 6 | | 3.90 | | | |
| 4 | | | | | | | | | +9.24 | 4.50 | | | Brownish yellow spotted white, silty fine to coarse SAND with some subangular fine to medium gravel sized quartz fragments. (ALLUVIUM) |
| | | | 100 | | | | 51 bls | 7 | +8.79 | 4.95 | | | |
| 5 | | | 100 | | | | 177 bls | 8 | | 5.40 | | | Yellowish brown spotted white, silty fine to coarse SAND with much subangular fine to coarse gravel sized quartz fragments. (ALLUVIUM) |
| 6 | | | | | | | | | +7.74 | 6.00 | | V | Extremely weak, light yellowish brown spotted white, completely decomposed, coarse ash crystal TUFF. (Stiff, sandy clayey SILT with occasional fine to coarse gravel) |
| | | | 88 | | | | 26 bls | 9 | | | | | |
| | | | 78 | | | | 43 bls | 10 | | | | | |
| 24/03/2009 | PX 6.90 | Dry at 18:00 | | | | | | | +6.84 | 6.90 | | | Hole completed at 6.90m. |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **25/03/2009**

CHECKED **James Lu**

DATE **26/03/2009**

REMARKS

**Site H**

**(2108/XRL/D329, 2108/XRL/EDH27 to 2108/XRL/EDH28)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/D329**

SHEET 1 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831793.42** **N 824512.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **23/09/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.62** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | +12.62 | 0.00 | | | |
| 25/09/2008 | PX | 08:00 | 0 | | | | | 1 INSPECTION PIT | | | | V | Extremely weak, reddish yellow spotted dark greenish grey and white, completely decomposed, fine grained GRANITE. (Silty fine to coarse SAND with some fine gravel) |
| 25/09/2008 26/09/2008 | | 18:00 08:00 | | | | | | 2 | | 0.90 0.95 | | | |
| | | | 88 | | | | 180 bls | 3 4 | +11.12 | 1.50 | | V | Extremely weak, greenish grey spotted light grey and white, mottled yellowish brown, completely decomposed, fine grained GRANITE. (Silty fine to coarse SAND with some fine to occasional medium gravel) |
| 2 | | | | | | | | | | 1.85 | | | |
| 3 | PX 3.00 | | | | | | | | +9.62 | 3.00 | | | |
| | HX | | 82 | | | | 234 bls | 5 6 | | 3.33 | | V | Extremely weak, yellowish brown spotted dark greenish grey, mottled white, completely decomposed, fine grained GRANITE. (Clayey/silty sandy fine to coarse GRAVEL) |
| 4 | | | | | | | | | | | | | |
| | HX 4.51 | 2.50m at 18:00 | 100 | 66 | 66 | NI | | | +8.11 | 4.51 | | III | Moderately strong, pink spotted dark greenish grey, mottled yellowish brown, moderately decomposed, fine grained GRANITE. Joints are very closely to closely spaced, locally medium spaced, rough stepped and rough undulating, extremely narrow, locally very narrow, iron and manganese oxide stained, chlorite and kaolin (thickness from<0.5mm up to 1mm) infilled, dipping at 40° to 50° and 60° to 70°, locally 20° to 30°. From 5.17m to 5.46m : Strong, slightly decomposed silicified granite along a quartz vein of maximum thickness 5mm dipping at 70° to 80°. |
| 26/09/2008 29/09/2008 5 | | 2.80m at 08:00 | 100 | 79 | 69 | 7.8 | | T2IOI | | 4.80 | | | |
| | | | 100 | 71 | 44 | | | T2IOI | | 5.32 | | | |
| 6 | | | | | | >20 | | T2IOI | | | | | |
| | | | 100 | 60 | 53 | 8.2 | | T2IOI | | 6.09 | | | |
| 7 | | | 96 | 96 | 71 | 8.2 | | T2IOI | | 6.77 | | | |
| | | | 98 | 53 | 32 | 20.0 | | T2IOI | | 7.75 | | | |
| 8 | | | | | | 2.6 | | | +4.50 | 8.12 | | II | Strong, pink spotted dark greenish grey, light grey and white, locally mottled dark greenish grey, slightly decomposed, fine grained GRANITE with some microfractures dipping at 10° to 20°, 20° to 30°, 40° to 50°, 60° to 70° and 80° to 90°. Joints are closely to medium spaced, locally extremely closely to very closely and widely spaced, rough stepped and rough undulating, locally smooth planar and smooth stepped, extremely narrow, locally very narrow, chlorite |
| | | | | | | >20 | | T2IOI | | | | | |
| 9 | | | | | | 12.0 | | | | 9.20 | | | |
| | | | 100 | 87 | 67 | | | T2IOI | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

1. Acoustic televiewer survey was carried out from the depths of 4.20m to 47.44m.
2. Packer tests were carried out from the depths of 8.00m to 14.00m, 14.00m to 20.00m, 20.00m to 26.00m, 26.00m to 32.00m, 32.00m to 38.00m and 38.00m to 47.99m.
3. Standpipe was installed at a depth of 30.00m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/D329**

SHEET **2** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831793.42 N 824512.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **23/09/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.62** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | | | | | | | | | 10.00 | | | |
| | | | 100 | 44 | 18 | | | T2IOI | | 10.12 | | | white kaolin (thickness from <0.5mm up to 1mm) and locally quartz infilled, dipping at 10° to 20°, 20° to 30°, 40° to 50°, 60° to 70° and 80° to 90°, locally 0° to 10°. From 8.19m to 8.91m : With 80° to 90°joints. From 9.03m to 9.19m : With a coarse gravel sized pocket of pegmatite. From 9.05m to 11.40m : With 80° to 90° joints where incipient from 9.37m to 9.62m, 9.70m to 9.85m and 10.53m to 10.67m. |
| 11 | | 2.50m at 18:00 | | | | >20 | | | | | | | |
| 29/09/2008 02/10/2008 | | 2.50m at 08:00 | 100 | 80 | 62 | 5.3 | | | | 11.58 | | | From 11.90m to 12.05m : With a pegmatite vein of maximum thickness 22mm dipping at 70° to 80°. From 12.23m to 15.09m : With 80° to 90° joints where incipient from 12.23m to 12.51m and 13.96m to 14.34m. |
| 12 | | | | | | >20 | | | | | | | |
| 13 | | | 100 | 74 | 71 | 9.1 | | | | 12.91 | | | From 13.13m to 13.28m : With pegmatite veins of maximum thickness 30mm dipping at 20° to 30° and 80° to 90°. |
| 14 | | | | | | 13.4 | | | | | | | |
| | | | 100 | 76 | 49 | | | | | 14.10 | | | |
| 15 | | | | | | >20 | | | | | | | |
| | | | | | | 2.8 | | | | | | | |
| | | | 100 | 63 | 48 | >20 | | | | 15.39 | | | From 15.24m to 16.48m : With 80° to 90°joints. |
| 16 | | | | | | 11.1 | | | | | | | From 15.94m to 16.31m : Silicified granite. |
| 02/10/2008 03/10/2008 | | 2.50m at 18:00 | | | | | | | | | | | |
| | | 2.50m at 08:00 | 100 | 89 | 89 | 5.1 | | | | 16.58 | | | From 16.46m to 16.67m : Silicified granite. |
| 17 | | | | | | | | | | | | | |
| | | | 100 | 72 | 72 | | | | | 17.84 | | | From 17.50m to 17.84m : With 80° to 90° joints where incipient from 17.50m to 17.80m. |
| 18 | | | | | | 19.3 | | | | | | | |
| 19 | | | 100 | 80 | 62 | 3.2 | | | | 18.93 | | | From 19.20m to 19.23m : Moderately strong, moderately decomposed. |
| | | | | | | >20 | | | | | | | |
| 20 | | | | | | | | | | 19.90 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/D329**

SHEET 3 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT Contract NEX/2108 Ground Investigation Works for Express Rail Link

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831793.42 N 824512.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **23/09/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.62** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | | | 100 | 95 | 93 | 5.6 | | T2IO1 | | 20.00 | | III | From 20.44m to 20.68m : Moderately strong, moderately decomposed. |
| 21 | | | | | | | | | | | | II | |
| | | | 100 | 99 | 97 | | | | | 21.28 | | | From 21.19m to 21.38m : Silicified granite. |
| 22 | | | | | | | | T2IO1 | | | | III | From 22.01m to 22.58m : Moderately strong, moderately decomposed. From 22.01m to 22.50m : With an 80° to 90° joint where incipient from 22.34m to 22.50m. |
| | | | 100 | 100 | 94 | | | | | 22.75 | | II | From 22.01m to 22.58m : Moderately strong, moderately decomposed. From 22.01m to 22.50m : With an 80° to 90° joint where incipient from 22.34m to 22.50m. |
| 23 | | | | | | | | T2IO1 | | | | | |
| 24 | | | | | | | | | | | | | |
| | | | 100 | 92 | 82 | | | | | 24.20 | | | From 24.27m to 25.01m : With an 80° to 90° joint where incipient from 24.46m to 25.01m. |
| 25 | | 2.00m at 18:00 | | | | | | T2IO1 | | | | | From 24.78m to 24.99m : Chloritized granite. |
| | | 03/10/2008 | | | | | | | | | | | |
| | | 04/10/2008 2.60m at 08:00 | 100 | 98 | 85 | | | | | 25.19 | | | |
| 26 | | | | | | >20 | | T2IO1 | | | | | |
| | | | | | | 4.0 | | | | | | | |
| | | | 100 | 81 | 81 | >20 | | | | 26.58 | | | From 26.49m to 27.16m : With an 80° to 90° joint. |
| 27 | | | | | | 5.3 | | T2IO1 | | | | | From 27.16m to 27.27m : Silicified granite. |
| 28 | | | 100 | 77 | 59 | | | | | 27.92 | | | |
| | | | | | | 18.8 | | T2IO1 | | | | III | From 28.59m to 28.64m : With a pegmatite vein of maximum thickness 35mm dipping at 40° to 50°. |
| 29 | | | | | | >20 | | | | | | II | From 28.72m to 28.82m : Moderately strong, moderately decomposed. |
| | | | 100 | 73 | 59 | 5.7 | | | | 29.35 | | | |
| | | | | | | >20 | | | | | | | |
| | | | | | | 5.0 | | T2IO1 | | | | III | From 29.70m to 30.35m : With a slickensided |
| 30 | | | | | | | A | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/D329**

SHEET **4** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831793.42** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | **N 824512.35** | DATE FROM **23/09/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.62** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | | | | | | | | 30.00 | | II | undulating fracture dipping at 80° to 90°. From 29.74m to 29.89m : Moderately strong, moderately decomposed. From 30.11m to 30.30m : Fine grained granodiorite. From 30.44m to 30.80m : With an 80° to 90° joint. From 30.75m to 30.88m : Moderately strong, moderately decomposed. At 30.82m : With a slickensided undulating fracture dipping at 73°. From 31.40m to 32.05m : With an 80° to 90° joint where incipient from 31.40m to 31.57m. |
| | | | | | | >20 | | T2IOI | | 30.65 | | III | |
| 31 | | | 100 | 100 | 100 | 8.1 | | T2IOI | | | | II | |
| | | | 100 | 94 | 74 | 2.9 | | T2IOI | | 31.27 | | | |
| 32 | | 2.50m at 18:00 | | | | | | T2IOI | | | | | |
| | | | | | | 17.4 | | | | 32.54 | | | |
| | 04/10/2008 06/10/2008 | 2.80m at 08:00 | 100 | 92 | 67 | | | | | | | | |
| 33 | | | | | | 4.0 | | T2IOI | | | | | From 33.15m to 33.33m : With an 80° to 90° joint where incipient from 33.29m to 33.33m. |
| | | | | | | 18.2 | | | | 33.70 | | | |
| | | | 100 | 100 | 100 | 3.5 | | T2IOI | | | | | |
| 34 | | | 100 | 97 | 82 | | | T2IOI | | 34.31 | | | |
| 35 | | | | | | 19.5 | | T2IOI | | | | | From 35.11m to 36.32m : With 80° to 90° joints. |
| | | | | | | 8.3 | | | | 35.53 | | | |
| | | | 100 | 77 | 64 | | | T2IOI | | | | | |
| 36 | | | | | | | | | | | | | |
| | | 2.50m at 18:00 | | | | 13.3 | | | | | | | From 36.75m to 37.49m : With 80° to 90° joints. |
| 37 | 06/10/2008 08/10/2008 | 2.80m at 08:00 | 100 | 64 | 43 | | | | | 36.99 | | | |
| | | | | | | | | T2IOI | | | | | From 37.30m to 37.44m : Autolith of fine grained granodiorite. From 37.36m to 37.48m : Silicified granite. At 37.55m : Coarse grained granite vein of maximum thickness 20mm dipping at 60° to 70°. From 37.64m to 38.02m : Finely feldsparphyric rhyolite dipping at 40° to 50°. From 37.66m to 37.97m : With 80° to 90° joints. |
| 38 | | | 100 | 100 | 95 | 7.7 | | | | 37.85 | | | |
| | | | | | | | | T2IOI | | | | | |
| 39 | | | | | | | | | | | | | |
| | | | 100 | 87 | 87 | | | T2IOI | | 39.32 | | III | From 39.29m to 39.75m : Moderately strong, moderately decomposed. |
| 40 | | | | | | | | | | | | II | From 39.70m to 39.94m : With an 80° to 90° |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/D329**

SHEET **5** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831793.42** **N 824512.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **23/09/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.62** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | | | | | | | | | | 40.00 | | | |
| | | | 100 | 97 | 97 | | | T2IO1 | | 40.09 | | | joint.<br>From 40.03m to 40.09m : Silicified granite of maximum thickness 40mm with a quartz vein of maximum thickness 4mm dipping at 50° to 60°.<br>From 40.50m to 41.18m : With an 80° to 90° joint. |
| 41 | | | | | | | | | | 41.21 | | | |
| | | | 100 | 100 | 92 | 3.9 | | T2IO1 | | | | | |
| 42 | | | | | | | | | | 42.44 | | | |
| | | | 100 | 100 | 100 | | | T2IO1 | | | | | |
| 43 | | 2.50m at 18:00 | | | | | | | | | | | |
| | | 08/10/2008 | | | | | | | | 43.80 | | | |
| 44 | | 09/10/2008 2.90m at 08:00 | 100 | 95 | 90 | >20 | | T2IO1 | | | | | |
| | | | | | | 0.6 | | | | | | | |
| 45 | | | | | | | | | | 45.26 | | | |
| | | | 100 | 100 | 100 | | | T2IO1 | | | | | |
| 46 | | | | | | 4.7 | | | | 46.21 | | | From 46.04m to 47.31m : With 80° to 90° joints where incipient from 47.17m to 47.31m. |
| | | | 100 | 48 | 48 | | | T2IO1 | | | | | |
| 47 | | | | | | | | | | 46.83 | | | |
| | | | 100 | 92 | 88 | | | T2IO1 | | | | | |
| 48 | | 2.60m at 18:00 | | | | | | | -35.37 | 47.99 | | | |
| | | 09/10/2008 | | | | | | | | | | | Hole completed at 47.99m. |
| 49 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH27**

SHEET 1 OF 3

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831814.58** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | **N 824493.63** | DATE FROM **13/10/2008** TO **15/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.83** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | +12.83 | 0.00 | | | |
| 13/10/2008 | PX | 08:00 | | | | | | | +12.73 | 0.10 | | | CONCRETE surface. |
| | | 0.60m at 18:00 | 0 | | | | | 1 INSPECTION PIT | | 0.50 | | | Greyish brown mottled white, brown and green, silty sandy angular fine to coarse GRAVEL sized concrete and tile fragment. (FILL with intense offensive smell) |
| 13/10/2008 14/10/2008 | | 0.60m at 08:00 | 90 | | | | | 2 | +12.12 | 0.65 0.71 | | | |
| 1 | PX 1.23 | | | | | | | 3 T2IO1 | | | | | CONCRETE with plastic sheeting underneath. |
| | HX | | 100 | | | | | T2IO1 | | 1.23 | | | |
| | | | 100 | 26 | 0 | NI | | T2IO1 | +11.17 | 1.66 | | II | Strong, pink spotted dark greenish grey and white, locally mottled dark grey, slightly decomposed, fine grained GRANITE with intense microfractures dipping at 20° to 30°, 40° to 50°, 60° to 70° and 80° to 90°. Joints are closely to medium spaced, locally very closely and widely spaced, smooth and rough stepped and undulating, locally smooth planar and rough planar, extremely narrow, chlorite and white kaolin (<0.5mm thick) infilled, locally iron oxide stained, dipping at 20° to 30°, 40° to 50° and 60° to 70°, locally 10° to 20° and 80° to 90°. From 1.66m to 2.13m : Silicified granite with quartz veining of maximum thickness 15mm. |
| 2 | HX 2.13 | | | | | 15.5 | | T2IO1 | | 2.13 | | | |
| | | | 100 | 57 | 28 | >20 | | T2IO1 | | | | | |
| 3 | | | 100 | 98 | 98 | 4.2 | | T2IO1 | | 2.88 | | | |
| 4 | | | | | | | | T2IO1 | | | | | |
| | | | 100 | 100 | 82 | | | | | 4.33 | | | |
| 5 | | | | | | | | T2IO1 | | | | | |
| | | | | | | 15.9 | | | | | | III | From 5.31m to 5.42m : Moderately strong, moderately decomposed. |
| | | | | | | | | | | | | II | |
| 6 | | | 100 | 100 | 85 | 2.2 | | T2IO1 | | 5.75 | | | |
| | | | | | | 14.7 | | | | | | | |
| 7 | | | | | | | | T2IO1 | | 7.32 | | | |
| | | | 100 | 95 | 73 | 5.0 | | | | | | | |
| 8 | | | | | | | | T2IO1 | | | | | |
| | | 0.55m at 18:00 | | | | >20 | | | | | | | |
| 14/10/2008 9 15/10/2008 | | 0.75m at 08:00 | 100 | 100 | 89 | 8.2 | | T2IO1 | | 8.82 | | | |
| | | | | | | >20 | | | | | | | |
| 10 | | | | | | 10.9 | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **16/10/2008**

CHECKED **James Lu**

DATE **17/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH27**

SHEET 2 OF 3

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831814.58** **N 824493.63** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | | DATE FROM **13/10/2008** TO **15/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.83** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | | | | | | | | | 10.00 | | | |
| | | | 100 | 96 | 71 | >20 4.9 | | T2IOI | | 10.21 | | | From 10.01m to 10.54m : With 80° to 90° joints. |
| 11 | | | | | | | | | | | | | |
| 12 | | | 100 | 100 | 79 | >20 4.4 | | T2IOI | | 11.78 | | | |
| 13 | | | | | | | | | | | | | |
| 14 | | | 100 | 90 | 79 | >20 | | T2IOI | | 13.28 | | | |
| 15 | | | 100 | 90 | 86 | 1.9 >20 6.0 | | T2IOI | | 14.77 | | | From 15.27m to 15.52m : With a fault plane dipping at 80° to 90°. |
| 16 | | | | | | | | | | | | | |
| | | | 100 | 96 | 93 | | | T2IOI | | 16.31 | | | From 16.71m to 17.56m : With an 80° to 90° joint where incipient from 16.98m to 17.56m. |
| 17 | | | | | | | | | | | | | |
| 18 | | | 100 | 100 | 87 | | | T2IOI | | 17.80 | | | From 17.73m to 17.83m : With a fault plane dipping vertically. |
| 19 | | | | | | | | | | | | | |
| | | | 100 | 100 | 84 | | | T2IOI | | 19.29 | | | |
| 20 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **16/10/2008**

CHECKED **James Lu**

DATE **17/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH27**

SHEET 3 OF 3

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831814.58 N 824493.63** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | | DATE FROM **13/10/2008** TO **15/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.83** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | | | | | | | | | | 20.00 | | | See sheet 2 of 3 for details. |
| 21 | | | 100 | 100 | 100 | | | T2IOI | | 20.81 | | | |
| 22 | | | | | | 1.1 | | T2IOI | | | | | |
| 23 | | | 100 | 100 | 100 | | | T2IOI | | 22.35 | | | |
| 15/10/2008 | | 0.60m at 18:00 | | | | | | | -11.02 | 23.85 | | | |
| 24 | | | | | | | | | | | | | Hole completed at 23.85m. |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **16/10/2008**

CHECKED **James Lu**

DATE **17/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH28**

SHEET 1 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT Contract NEX/2108 Ground Investigation Works for Express Rail Link

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831798.51** **N 824470.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | | DATE FROM **03/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.90** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 03/10/2008 | PX | 08:00 | | | | | | | +12.90 | 0.00 | | | |
| | | | | | | | | | +12.80 | 0.10 | | | CONCRETE surface. |
| | | | | | | | | 1 INSPECTION PIT | | | | | Yellowish brown, silty fine to coarse SAND with some angular to subangular fine gravel sized quartz fragments and much fine to coarse gravel sized moderately decomposed and slightly decomposed granite fragments. (FILL) |
| | | | | | | | | 2 | | 0.50 | | | |
| 03/10/2008 | | 18:00 | 128 | | | | | | +12.20 | 0.70 | | | |
| 04/10/2008 | | 0.60m at 08:00 | 100 | 0 | 0 | >20 | | 3 T2\|O\| | | | | II | Strong, pink spotted dark greenish grey, light grey and locally white, locally mottled dark greenish grey and yellowish brown, slightly decomposed, fine grained GRANITE. Joints are very closely to closely spaced, locally extremely closely and medium spaced, smooth and rough planar, stepped and undulating, extremely narrow, calcite, chlorite and locally white kaolin (<0.5mm thick) infilled, locally iron oxide stained, dipping at 20° to 30°, 40° to 50° and 60° to 70°, locally 70° to 80° and 80° to 90°. From 0.70m to 1.38m : With an 80° to 90° joint. |
| 1 | | | 100 | 56 | 22 | | | T2\|O\| | | 1.12 | | | |
| | PX 1.69 | | | | | | | | | | | | |
| | HX | | 100 | 96 | 80 | 3.3 | | T2\|O\| | | 1.67 | | | |
| 2 | HX 2.12 | | | | | 14.7 | | | | | | | |
| | | | | | | 2.7 | | | | | | | |
| 3 | | | 100 | 89 | 50 | >20 | | T2\|O\| | | 3.04 | | | |
| | | | | | | 9.6 | | | | | | | |
| 4 | | | | | | | | T2\|O\| | | | | | |
| | | | 100 | 90 | 71 | >20 | | | | 4.53 | | | From 4.34m to 4.92m : With 80° to 90° joints where incipient from 4.34m to 4.53m. |
| 5 | | | | | | 9.0 | | T2\|O\| | | | | | |
| | | | | | | | | | | | | | From 5.54m to 5.60m : Moderately strong, moderately decomposed. |
| 6 | | | 100 | 91 | 45 | | | T2\|O\| | | 6.06 | | | |
| | | | | | | >20 | | | | | | | |
| 7 | | | | | | 11.4 | | | | | | | |
| | | | 100 | 47 | 9 | >20 | | T2\|O\| | | 7.54 | | | From 7.54m to 8.33m : With 80° to 90° joints. |
| 8 | | | | | | 19.6 | | | | | | | |
| | | | | | | | | T2\|O\| | | 8.70 | | | |
| 9 | | | 100 | 54 | 29 | | | T2\|O\| | | | | | |
| | | | | | | >20 | | | | 9.50 | | | |
| | | | 100 | 99 | 68 | 12.6 | | T2\|O\| | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/11/2008**

REMARKS

1. Packer tests were carried out from the depths of 4.00m to 10.00m, 10.00m to 16.00m, 16.00m to 22.00m, 22.00m to 28.00m, 28.00m to 34.00m, 34.00m to 40.00m and 40.00m to 48.55m.
2. Acoustic televiewer survey was carried out from the depth of 2.34m to 48.40m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.
## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH28**

SHEET **2** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831798.51** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | **N 824470.53** | DATE FROM **03/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.90** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | | | | | | | | | 10.00 | | | |
| 11 | | | 100 | 86 | 59 | >20 | | T2IO1 | | 11.02 | | | |
| 12 | | 0.80m at 18:00 04/10/2008 | | | | 5.8 | | T2IO1 | | 12.42 | | III | From 12.04m to 12.52m : Chloritized and silicified granite with quartz veins. At 12.40m : With a quartz-galena vein of maximum thickness 30mm dipping at 30° to 40°. |
| 13 | | 0.80m at 08:00 06/10/2008 | 100 | 58 | 41 | >20 | | T2IO1 | +0.02 | 12.88 | | IV | From 12.52m to 12.88m : Moderately strong, moderately decomposed. |
| | | | 100 | 74 | 33 | 6.2 | | T2IO1 | -0.21 | 13.11 | | III | At 12.62m : With a quartz-galena vein of maximum thickness 15mm dipping at 50° to 60°. |
| 14 | | | | | | NI | | | | | | | Weak to moderately weak, light greenish grey spotted light grey, pink and dark greenish grey, highly decomposed, fractured, fine grained GRANITE. |
| | | | 100 | 86 | 59 | 15.2 | | T2IO1 | | 14.53 | | II | Strong, pink spotted dark greenish grey, light grey and white, locally mottled dark greenish grey, locally greenish grey, slightly decomposed, fine grained GRANITE. |
| 15 | | | | | | >20 | | | | | | | Joints are very closely to closely spaced, locally extremely closely and widely spaced, smooth and rough planar, stepped and undulating, extremely narrow, calcite and chlorite infilled, locally iron oxide stained, dipping at 20° to 30°, 40° to 50° and 60° to 70°, locally 70° to 80° and 80° to 90°. |
| 16 | | | | | | 14.0 | | T2IO1 | | | | | From 13.11m to 13.91m : Moderately strong, moderately decomposed. |
| | | | 100 | 100 | 67 | 10.0 | | T2IO1 | | 16.08 | | | From 15.21m to 15.42m : With an 80° to 90° joint. |
| 17 | | | | | | | | | | | | | From 17.10m to 17.39m : Chloritized and silicified granite. |
| | | | 100 | 78 | 44 | >20 | | T2IO1 | | 17.58 | | | |
| 18 | | | | | | 7.3 | | | | | | | |
| 19 | | | 100 | 95 | 87 | | | T2IO1 | | 19.06 | | | |
| 20 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH28**

SHEET 3 OF 5

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831798.51 N 824470.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | | DATE FROM **03/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.90** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | | | | | | | | | | 20.00 | | | From 20.19m to 20.49m : With 80° to 90° joints. |
| | | | | | | 10.3 | | T2IOI | | 20.57 | | | |
| | | | 100 | 77 | 70 | | | | | | | | |
| 21 | | | | | | 5.9 | | T2IOI | | | | | From 21.28m to 21.95m : Chloritized and silicified granite. |
| 22 | | | 100 | 86 | 58 | | | | | 22.07 | | | |
| | | | | | | | | T2IOI | | | | | From 22.87m to 23.36m : With an 80° to 90° joint. |
| 23 | | 0.90m at 18:00 | | | | 13.3 | | | | | | | |
| 08/10/2008 | | | | | | >20 | | | | 23.55 | | | |
| 08/10/2008 | | 0.95m at 08:00 | 100 | 91 | 80 | 6.5 | | | | | | | |
| 24 | | | | | | | | T2IOI | | | | | From 24.66m to 24.81m : With an 80° to 90° joint. |
| 25 | | | 100 | 95 | 92 | | | | | 24.99 | | | |
| 26 | | | | | | | | T2IOI | | | | | |
| | | | 100 | 99 | 93 | | | | | 26.51 | | | |
| 27 | | | | | | | | T2IOI | | | | | |
| 28 | | | 100 | 100 | 88 | | | | | 28.05 | | | |
| 29 | | | | | | | | T2IOI | | | | | |
| | | | 100 | 100 | 97 | | | | | 29.56 | | | |
| 30 | | | | | | | | T2IOI | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/11/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH28**

SHEET **4** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831798.51** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | **N 824470.53** | DATE FROM **03/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.90** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | | | | | | | | | | 30.00 | | | |
| 31 | | | 100 | 94 | 94 | >20 | | T2IOI | | 31.02 | | | |
| 32 | | | | | | 5.0 | | T2IOI | | | | | |
| 33 | | | 100 | 90 | 67 | | | T2IOI | | 32.58 | | | |
| 34 | | | | | | >20 | | T2IOI | | 34.05 | | | From 33.84m to 34.03m : With intense microfractures oriented randomly. |
| 35 | | | 100 | 96 | 80 | 5.0 | | T2IOI | | | | | |
| 36 | | | 100 | 65 | 53 | | | T2IOI | | 35.47 | | | From 36.21m to 37.00m : With 80° to 90° joints where incipient from 36.92m to 37.00m. |
| 37 | | | 100 | 81 | 72 | 13.6 | | T2IOI | | 36.97 | | | |
| 38 | | 0.90m at 18:00 | | | | 0.9 | | T2IOI | | | | | |
| 08/10/2008 09/10/2008 | | 0.90m at 08:00 | 100 | 98 | 59 | | | T2IOI | | 38.46 | | | |
| 39 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | 39.95 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/10/2008**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/EDH28**

SHEET **5** OF **5**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 831798.51** **N 824470.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **D51** | | DATE FROM **03/10/2008** TO **09/10/2008** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+12.90** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | | | 100 | 81 | 63 | | | T2IOI | | 40.00 | | | |
| 41 | | | 100 | 91 | 65 | >20 | | T2IOI | | 41.39 | | | From 41.52m to 42.00m : With intense quartz veins of thickness from <0.5mm up to 5mm dipping at 60° to 70° and 80° to 90°. From 41.56m to 41.59m : Chloritized granite. |
| 42 | | | | | | 1.7 | | | | | | | |
| 43 | | | 100 | 100 | 86 | 16.7 | | T2IOI | | 42.89 | | | |
| 44 | | | | | | 7.1 | | T2IOI | | | | | |
| 45 | | | 100 | 95 | 83 | 1.4 | | T2IOI | | 44.41 | | | |
| 46 | | | | | | >20 | | | | | | | |
| 47 | | | 100 | 85 | 44 | 1.6 | | T2IOI | | 45.92 | | | |
| 48 | | 0.85m at 18:00 09/10/2008 | 100 | 41 | 29 | 10.4 | | T2IOI | -35.65 | 47.36 | | | From 47.06m to 47.88m : Chloritized and silicified granite. From 47.53m to 48.55m : With 80° to 90° joints where incipient from 47.53m to 47.75m. From 47.96m to 48.31m : Chloritized and silicified granite. |
| 49 | | | | | | >20 | | | | 48.55 | | | Hole completed at 48.55m. |
| 50 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **D.Y. Yip**

DATE **10/10/2008**

CHECKED **James Lu**

DATE **11/11/2008**

REMARKS

**Landfill**

**(2108/XRL/A4a to 2108/XRL/A4b)**

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET 1 OF 7

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | **N 838210.12** | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | +31.74 | 0.00 | | | |
| 24/04/2009 | SX | 08:00 | | | | | | 1 | | 0.50 | | | Firm, brown spotted white, sandy clayey SILT with some angular fine to coarse gravel sized moderately decomposed tuff fragments. (FILL) |
| 1 | | | | | | | | 2 INSPECTION PIT | +30.74 | 1.00 | | | Stiff, red, dappled yellow, sandy clayey SILT. (RESIDUAL SOIL) |
| 24/04/2009 | | 18:00 | | | | | | 3 | | 1.50 | | | |
| 28/04/2009 | | Dry at 08:00 | | | | | 2,3 4,4,4,5 N=17 | 4 | +29.74 | 2.00 | | V | Extremely weak, light yellowish brown spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Stiff, sandy SILT) |
| 3 | | | | | | | | 5 | | | | | |
| | | | | | | | | 6 | | 2.45 | | | |
| 4 | | | | | | | 1,3 4,4,5,6 N=19 | 7 | | 4.00 | | | From 4.00m to 6.00m : Yellowish red. |
| 5 | | | | | | | | 8 | | 4.45 | | | |
| 6 | SX 6.00 PX | | | | | | 3,3 3,5,5,7 N=20 | 9 | | 6.00 | | | |
| 7 | | | | | | | | 10 | | 6.45 | | | |
| 8 | | | | | | | | | +23.74 | 8.00 | | | |
| | | | | | | | 3,4 4,5,6,7 N=22 | 11 | | | | V | Extremely weak, brownish yellow spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Stiff, sandy SILT) |
| 9 | | | | | | | | 12 | | 8.45 | | | |
| 10 | | | | | | | | | | 10.00 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS
1. Water samples were taken at the depths of 50.50m and 55.50m.
2. Piezometer tip was installed at a depth of 34.00m.
3. Six bottles of water sample were taken at a depth of 48.50m.

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET 2 OF 7

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** **N 838210.12** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | PX | | | | | | 2,3 4,6,7,9 N=26 | 13 14 | | 10.00 10.45 | | | See sheet 1 of 7 for details. |
| 11 | | | | | | | | | | | | | |
| 12 | | | | | | | 2,4 4,4,7,10 N=25 | 15 16 | +19.74 | 12.00 12.45 | | V | Extremely weak, yellowish red spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stuff, sandy SILT) |
| 13 | | | | | | | | | | | | | |
| 14 | | | | | | | 3,4 7,8,9,11 N=35 | 17 18 | | 14.00 14.45 | | | |
| 15 | | | | | | | | | | | | | |
| 16 28/04/2009 29/04/2009 | | 1.25m at 18:00 2.50m at 08:00 | | | | | 3,4 4,7,9,11 N=31 | 19 20 | | 16.00 16.45 | | | From 16.00m to 22.00m : Red. |
| 17 | | | | | | | | | | | | | |
| 18 | | | | | | | 3,6 6,7,9,11 N=33 | 21 22 | | 18.00 18.45 | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | 20.00 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET 3 OF 7

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT Contract NEX/2108 Ground Investigation Works for Express Rail Link

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15 N 838210.12** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | PX | | | | | | 6,9 13,15,18,21 N=67 | 23 24 | | 20.00 20.45 | | | See sheet 2 of 7 for details. |
| 22 | | | | | | | 5,6 8,9,17,26 N=60 | 25 26 | +9.74 | 22.00 22.45 | | V | Extremely weak, yellowish brown spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT) |
| 24 | | | | | | | 4,9 10,13,17,25 N=65 | 27 28 | | 24.00 24.45 | | | |
| 26 | | | | | | | 4,10 15,15,17,28 N=75 | 29 30 | | 26.00 26.45 | | | |
| 28 28/04/2009 | PX 28.00 | 3.90m at 18:00 | | | | | | | +3.74 | 28.00 | | | |
| 30 30/04/2009 | HX | 7.50m at 08:00 | | | | | 4,9 11,16,16,28 N=71 | 31 32 | | 28.45 | | V | Extremely weak, light yellowish brown spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT) |
| 30 | | | | | | | | | | 30.00 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET **4** OF **7**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | **N 838210.12** | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | HX | | | | | | 5,7 12,13,20,30 N=75 | 33 34 | | 30.00 30.45 | | | See sheet 3 of 7 for details. |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | 5,8 11,13,21,29 N=74 | 35 36 | | 32.00 32.45 | | | |
| 33 | | | | | | | | | | | | | |
| 34 | | | | | | | 5,8 10,11,15,31 N=67 | 37 38 | | 34.00 34.45 | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | 5,6 11,11,15,28 N=65 | 39 40 | | 36.00 36.45 | | | |
| 37 | | | | | | | | | | | | | |
| 38 | | | | | | | 7,15 15,17,21,33 N=86 | 41 42 | | 38.00 38.45 | | | |
| 39 | | | | | | | | | | | | | |
| 40 20/04/2009 | | 4.10m at 18:00 | | | | | | | -8.26 | 40.00 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET 5 OF 7

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | **N 838210.12** | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | | | | | | | | | | 40.00 | | | |
| 04/05/2009 | HX | 21.05m at 08:00 | | | | | 5,10 15,23,26,32 N=96 | 43 44 | | 40.45 | | V | Extremely weak, brownish grey spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT) |
| 41 | | | | | | | | | | | | | |
| 42 | | | | | | | 6,12 16,17,20,25 N=78 | 45 46 | | 42.00 42.45 | | | |
| 43 | | | | | | | | | | | | | |
| 44 | | | | | | | 8,16 20,22,25,31 N=98 | 47 48 | | 44.00 44.45 | | | |
| 45 | | | | | | | | | | | | | |
| 46 | | | | | | | 7,14 16,18,23,30 N=87 | 49 50 | | 46.00 46.45 | | | |
| 47 | | | | | | | | | | | | | |
| 48 | | 2.70m at 18:00 | | | | | 8,13 16,19,25,31 N=91 | 51 52 | | 47.50 47.95 | | | |
| 04/05/2009 05/05/2009 | | 24.52m at 08:00 | 70 | | | | 200 bls | 53 54 | -16.61 | 48.35 48.72 | | V | Extremely weak, grey spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT with occasional fine to medium gravel) |
| 49 05/05/2009 07/05/2009 | | 6.20m at 18:00 27.90m at 08:00 | 70 | | | | | 55 | -17.26 | 49.00 | | V | Extremely weak, light greyish brown spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT) |
| 50 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET **6** OF **7**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** **N 838210.12** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | HX | | | | | | 7,12 12,17,20,29 N=78 | 56 57 58 △ | | 50.00 50.10 50.55 | | | See sheet 5 of 7 for details. |
| 51 | | | | | | | | | | | | | |
| 52 | | | | | | | 7,11 13,12,27,28 N=80 | 59 60 | | 52.00 52.45 | | | |
| 53 | | | 90 | | | | | 61 | | 53.00 | | | |
| 54 | | 7.20m at 18:00 07/05/2009 | | | | | | | | | | | |
| | | 26.50m at 08:00 08/05/2009 | | | | | 6,12 12,17,21,29 N=79 | 62 63 64 △ | | 54.10 54.55 | | | |
| 55 | | | | | | | | | | | | | |
| 56 | | | | | | | 8,11 13,13,27,31 N=84 | 65 66 | | 56.00 56.45 | | | |
| 57 | | | 90 | | | | | 67 | | 57.00 | | | |
| 58 | | | | | | | 8,12 14,24,29,32 N=99 | 68 69 70 | -26.36 | 58.10 58.55 | | V | Extremely weak, brownish grey spotted white, completely decomposed, slightly metamorphosed, coarse ash crystal TUFF. (Very stiff, sandy SILT) |
| 59 | | | | | | | | | | | | | |
| 60 | | | | | | | | | | 60.00 | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- △ WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- V IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **Y.K. Lee** |
| DATE | **12/05/2009** |
| CHECKED | **James Lu** |
| DATE | **13/05/2009** |

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4a**

SHEET 7 OF 7

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824256.15** **N 838210.12** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR128** | | DATE FROM **24/04/2009** TO **11/05/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+31.74** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | | | | | | | | 71 | | 60.00 | | | |
| | HX | | | | | | 9,13 13,18,26,30 N=87 | 72 | | 60.45 | | | See sheet 6 of 7 for details. |
| 61 | | | | | | | | | | | | | |
| | HX 61.55 | | | | | | | | -29.81 | 61.55 | | | |
| | | | 89 | 48 | 48 | >20 | | | | | | IV | Moderately weak, light grey spotted white, highly decomposed, fractured, slightly metamorphosed, coarse ash crystal TUFF. |
| 62 | | | | | | 5.3 | | T2IOI | -30.21 | 61.95 | | III | |
| | | | 100 | 100 | 76 | | | T2IOI | | 62.35 | | | Moderately strong, light brownish grey, locally light grey spotted white, moderately decomposed, slightly metamorphosed, coarse ash crystal TUFF. Joints are closely to medium spaced, locally widely and very closely spaced, rough planar, rough stepped and rough undulating, extremely narrow to very narrow, iron and manganese oxide stained, chlorite coated and occasional kaolin coated, dipping at 10° to 20°, 40° to 50° and 60° to 70°. |
| | | 5.30m at 18:00 | | | | | | | | | | | |
| 63 | | 08/05/2009 09/05/2009 23.80m at 08:00 | 100 | 100 | 100 | | | T2IOI | | 63.06 | | | |
| 64 | | | | | | 1.6 | | T2IOI | | | | | |
| | | | 98 | 87 | 43 | 8.9 | | T2IOI | | 64.46 | | | From 64.46m to 64.90m and 65.00m to 65.85m : With a subvertical joint. |
| 65 | | | | | | | | | | | | | |
| | | 7.50m at 18:00 | | | | | | | | | | | |
| | | 09/05/2009 11/05/2009 23.80m at 08:00 | 100 | 66 | 45 | >20 | | T2IOI | | 65.75 | | | |
| 66 | | | | | | 4.0 | | | | | | | |
| | | | | | | 20.0 | | | | | | | |
| 67 | | | | | | >20 | | T2IOI | | 66.96 | | | |
| | | | 100 | 100 | 100 | 1.2 | | T2IOI | | 67.52 | | | |
| | | | 100 | 94 | 90 | | | | | | | | |
| 68 | | | | | | 6.0 | | T2IOI | | 68.46 | | | |
| | | | 100 | 100 | 75 | | | | | | | | |
| 69 | | | | | | | | T2IOI | | | | | |
| | | 9.05m at 18:00 | | | | | | | | | | | |
| | | 11/05/2009 | | | | | | | -38.03 | 69.77 | | | From 69.35m to 69.77m : With some quartz veins 40mm thick, dipping at 60° to 70°. |
| 70 | | | | | | | | | | | | | Hole completed at 69.77m. |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **Y.K. Lee**

DATE **12/05/2009**

CHECKED **James Lu**

DATE **13/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

SHEET 1 OF 6

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824303.53 N 838082.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR97** | | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 20/04/2009 | SX | 08:00 | | | | | | 1 2 3 4 INSPECTION PIT | +20.18 | 0.00 | | V | Extremely weak, brownish grey spotted dark grey, mottled yellowish brown and locally dark brown, completely decomposed, slightly metamorphosed, coarse ash TUFF. (Very stiff, sandy SILT with occasional fine to medium gravel) |
| 1 | | | | | | | | | | 0.50 | | | |
| | | | | | | | | | | 1.00 | | | |
| 2 20/04/2009 | | 18:00 | | | | | | | | 1.50 | | | |
| 24/04/2009 | | 13.65m at 08:00 | | | | | | | | 2.00 | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **H.K. Fung**

DATE **04/05/2009**

CHECKED **James Lu**

DATE **05/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

SHEET **2** OF **6**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824303.53** **N 838082.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR97** | | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | SX | | | | | | | | | 10.00 | | | See sheet 1 of 6 for details. |
| 11 | SX 11.00 PX | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **H.K. Fung**

DATE **04/05/2009**

CHECKED **James Lu**

DATE **05/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

SHEET **3** OF **6**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824303.53** **N 838082.35** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR97** | | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | PX | | | | | | | | | 20.00 | | | See sheet 1 of 6 for details. |
| 21 | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | PX 30.00 | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

LOGGED **H.K. Fung**

DATE **04/05/2009**

CHECKED **James Lu**

DATE **05/05/2009**

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

SHEET **4** OF **6**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | |
|---|---|---|
| METHOD **Rotary Cored** | CO-ORDINATES **E 824303.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. **DR97** | **N 838082.35** | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | HX | | | | | | | | | 30.00 | | | See sheet 1 of 6 for details. |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | |
| 37 | | | 80 | | | | 115 bls | 5 | | 36.70 | | | |
| | | 0.20m at 18:00 | 100 | | | | 300 bls | | | 37.15 | | | |
| 24/04/2009 | | | | | | | | 6 | | | | | |
| 25/04/2009 | | 13.85m at 08:00 | 96 | | | | | 7 | | 37.55 | | | |
| 38 | | | | | | | | 8 | | 38.65 | | | |
| 39 | | | | | | | 3,10 15,19,21,23 N=78 | 9 | | | | | |
| | | 0.20m at 18:00 | | | | | | 10 | | 39.10 | | | |
| 25/04/2009 | | | | | | | | | | | | | |
| 27/04/2009 | | 13.80m at 08:00 | 75 | | | | | 11 | | 39.55 | | | |
| 40 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **H.K. Fung** |
| DATE | **04/05/2009** |
| CHECKED | **James Lu** |
| DATE | **05/05/2009** |

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

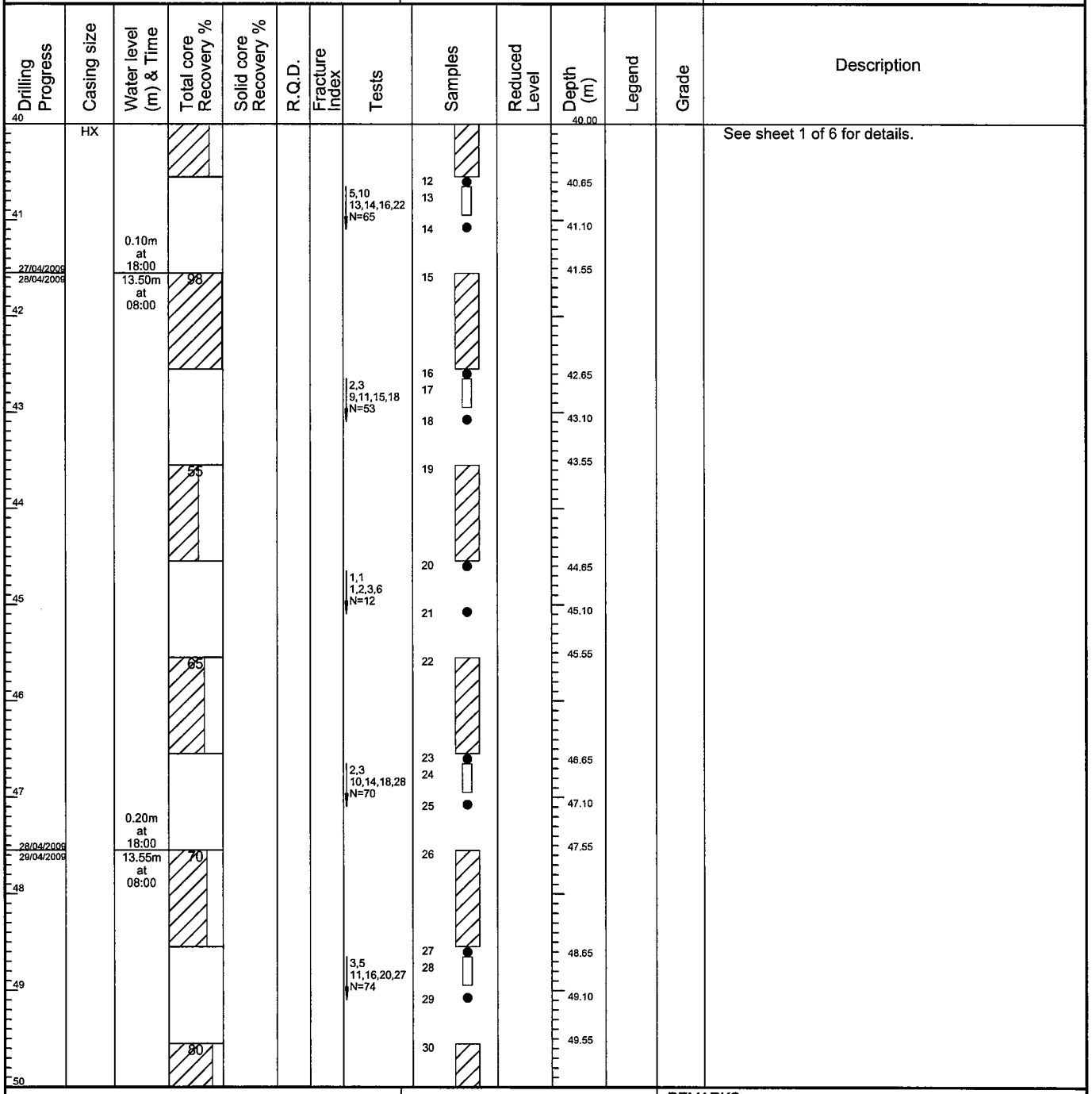
SHEET **5** OF **6**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824303.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR97** | **N 838082.35** | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |




- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
- WATER SAMPLE
- PIEZOMETER TIP
- STANDPIPE
- STANDARD PENETRATION TEST
- PERMEABILITY TEST
- IMPRESSION PACKER TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST

| | |
|---|---|
| LOGGED | **H.K. Fung** |
| DATE | **04/05/2009** |
| CHECKED | **James Lu** |
| DATE | **05/05/2009** |

REMARKS

# GEOTECHNICS & CONCRETE ENGG. (H.K.) LTD.

## GROUND INVESTIGATION DEPARTMENT

HOLE NO. **2108/XRL/A4b**

SHEET **6** OF **6**

## DRILLHOLE RECORD

CONTRACT NO. NEX/2108

PROJECT **Contract NEX/2108 Ground Investigation Works for Express Rail Link**

| | | | |
|---|---|---|---|
| METHOD | **Rotary Cored** | CO-ORDINATES **E 824303.53** | WORKS ORDER NO. **GCE/2008/001/SI/R** |
| MACHINE & NO. | **DR97** | **N 838082.35** | DATE FROM **20/04/2009** TO **30/04/2009** |
| FLUSHING MEDIUM | **Water** | ORIENTATION **Vertical** | GROUND LEVEL **+20.18** mPD |

| Drilling Progress | Casing size | Water level (m) & Time | Total core Recovery % | Solid core Recovery % | R.Q.D. | Fracture Index | Tests | Samples | Reduced Level | Depth (m) | Legend | Grade | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | HX | | | | | | | | | 50.00 | | | See sheet 1 of 6 for details. |
| 51 | | | | | | | 6,13 17,20,20,24 N=81 | 31 | | 50.65 | | | |
| | | | | | | | | 32 | | 51.10 | | | |
| 52 | | | 65 | | | | | 33 | | 51.55 | | | |
| 53 | | 0.20m at 18:00 | | | | | 9,10 11,17,23,29 N=80 | 34 35 | | 52.65 | | | |
| 29/04/2009 30/04/2009 | | 13.55m at 08:00 | 70 | | | | | 36 | | 53.10 | | | |
| 54 | | | | | | | | 37 | | 53.55 | | | |
| 55 30/04/2009 | HX 55.10 | 0.20m at 18:00 | | | | | 3,10 12,20,28,37 N=97 | 38 39 40 | -34.92 | 54.65 55.10 | | | |
| | | | | | | | | | | | | | Hole completed at 55.10m. |
| 56 | | | | | | | | | | | | | |
| 57 | | | | | | | | | | | | | |
| 58 | | | | | | | | | | | | | |
| 59 | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- SPT LINER SAMPLE
- U76 UNDISTURBED SAMPLE
- U100 UNDISTURBED SAMPLE
- MAZIER SAMPLE
- PISTON SAMPLE
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- IMPRESSION PACKER TEST
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- PACKER TEST

LOGGED **H.K. Fung**

DATE **04/05/2009**

CHECKED **James Lu**

DATE **05/05/2009**

REMARKS

| | |
|---|---|
| Appendix C | Laboratory Results and Standard forms 3.2 – 3.5 adopted from Guidance Manual |

# Summary Report of Soil and Groundwater Samples

Soil Sample Analysis under RBRG Industrial Limit

| | | | | | | VOC | | | | | | | | | | | | Metals | | | | | | | | | PCBs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site ID# | Sample ID | Ground level (mPD) | Sampling Date | Sub-sample Depth | Parameters | Acetone | Benzene | Bromodichloromethane | 2-Butanone | Chloroform | Ethylbenzene | Methyl tert-Butyl Ether | Methylene Chloride | Styrene | Tetrachloroethene | Toluene | Trichloroethene | Xylenes (total) | Cadmium | Copper | Lead | Mercury | Nickel | Zinc | Chromium III | Chromium VI | PCBs | Free Cyanide |
| | | | | | Reporting Limit (mg/kg) | 5 | 0.5 | 0.5 | 5 | 0.5 | 0.5 | 5 | 5 | 0.5 | 0.5 | 0.5 | 0.5 | 2 | 0.2 | 1 | 1 | 0.2 | 1 | 1 | 1 | 1 | 0.1 | 1 |
| | | | | | RBRG Industrial Limit (mg/kg) | 10000.00 | 9.21 | 2.85 | 10000.00 | 1.54 | 8240.00 | 70.10 | 13.90 | 10000.00 | 0.78 | 10000.00 | 5.68 | 1230.00 | 653.00 | 10000.00 | 2290.00 | 38.40 | 10000.00 | 10000.00 | 10000.00 | 1960.00 | 0.75 | 10000.00 |
| | | | | | Saturation Limit (mg/kg) | *** | 336 | 1030 | *** | 1100 | 138 | 2380 | 921 | 497 | 97.1 | 235 | 488 | 150 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | Unit | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| F | 2108/XRL/EDH29 | | 9-Oct-08 | 0.50-0.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 57 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 1.50-1.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 56 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | +13.19 | 9-Oct-08 | 3.00-3.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 84 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 4.50-4.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 43 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 6.00-6.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 123 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 0.50-0.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 91 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 1.50-1.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 50 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | +13.06 | 13-Oct-08 | 3.00-3.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 75 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 4.50-4.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 509 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 6.00-6.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 14 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH31 | | 15-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 11 | 110 | -- | -- | 337 | 8 | <1 | -- | -- |
| | 2108/XRL/EDH31 | +13.13 | 15-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 17 | 74 | -- | -- | 118 | 9 | <1 | -- | -- |
| | 2108/XRL/EDH31 | | 15-Oct-08 | 6.00-6.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 13 | 30 | -- | -- | 250 | 7 | <1 | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 0.50-0.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 32 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 1.50-1.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 61 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | +13.18 | 11-Oct-08 | 3.00-3.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 107 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 4.50-4.95 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 44 | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 6.00-6.45 | Pass | -- | <0.5 | -- | -- | -- | <0.5 | -- | -- | -- | -- | <0.5 | -- | <2 | -- | -- | 28 | -- | -- | -- | -- | -- | -- | -- |
| G | 2108/XRL/EDH33 | | 10-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.3 | 19 | 59 | <0.2 | 10 | 169 | 23 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH33 | +18.91 | 10-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 46 | 139 | <0.2 | 4 | 98 | 13 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH33 | | 11-Oct-08 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.3 | 15 | 155 | <0.2 | 3 | 241 | 11 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH33 | | 11-Oct-08 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 86 | <0.2 | 2 | 87 | 4 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.4 | 50 | 36 | <0.2 | 6 | 209 | 11 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH34 | +18.67 | 13-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 10 | 40 | <0.2 | 8 | 84 | 17 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 54 | <0.2 | 4 | 262 | 10 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 11 | 35 | <0.2 | 4 | 168 | 4 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH35 | | 18-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 30 | 55 | <0.2 | 7 | 130 | 13 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH35 | +18.86 | 18-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 23 | <0.2 | 3 | 140 | 8 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH35 | | 18-Oct-08 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 15 | 63 | <0.2 | 5 | 117 | 16 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH36 | | 15-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 7 | 30 | <0.2 | 6 | 70 | 12 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH36 | +18.88 | 15-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 23 | 46 | <0.2 | 6 | 82 | 20 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH36 | | 16-Oct-08 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 30 | 55 | <0.2 | 7 | 130 | 13 | <1 | <0.1 | <1 |
| S | 2108/XRL/EDHS01 | | 10-Jan-09 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 16 | 69 | -- | -- | 198 | 5 | <1 | -- | -- |
| | 2108/XRL/EDHS01 | | 10-Jan-09 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 55 | 56 | -- | -- | 226 | 4 | <1 | -- | -- |
| | 2108/XRL/EDHS01 | +10.79 | 12-Jan-09 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 16 | 69 | -- | -- | 198 | 5 | <1 | -- | -- |
| | 2108/XRL/EDHS01 | | 12-Jan-09 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 55 | 56 | -- | -- | 226 | 4 | <1 | -- | -- |
| | 2108/XRL/EDHS01 | | 12-Jan-09 | 6.00-6.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 46 | 105 | -- | -- | 273 | 6 | <1 | -- | -- |
| | 2108/XRL/EDHS02 | | 10-Jan-09 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 55 | 56 | -- | -- | 226 | 4 | <1 | -- | -- |
| | 2108/XRL/EDHS02 | | 10-Jan-09 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 46 | 105 | -- | -- | 273 | 6 | <1 | -- | -- |
| | 2108/XRL/EDHS02 | +10.69 | 13-Jan-09 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 13 | 56 | -- | -- | 97 | 4 | <1 | -- | -- |
| | 2108/XRL/EDHS02 | | 13-Jan-09 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 30 | 60 | -- | -- | 133 | 4 | <1 | -- | -- |
| | 2108/XRL/EDHS02 | | 13-Jan-09 | 6.00-6.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 33 | 38 | -- | -- | 123 | 6 | <1 | -- | -- |
| Q | 2108/XRL/EDH-Q01 | | 17-Feb-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 9 | 41 | -- | -- | 62 | 16 | <1 | -- | -- |
| | 2108/XRL/EDH-Q01 | | 17-Feb-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 8 | 62 | -- | -- | 77 | 9 | <1 | -- | -- |
| | 2108/XRL/EDH-Q01 | +11.63 | 18-Feb-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 14 | 71 | -- | -- | 158 | 9 | <1 | -- | -- |
| | 2108/XRL/EDH-Q01 | | 18-Feb-09 | 4.95-5.85 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 41 | 74 | -- | -- | 264 | 8 | <1 | -- | -- |
| | 2108/XRL/EDH-Q01 | | 18-Feb-09 | 5.85-6.30 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 24 | 98 | -- | -- | 240 | 10 | <1 | -- | -- |
| | 2108/XRL/EDH-Q02 | | 12-Feb-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 8 | 44 | -- | -- | 65 | 15 | <1 | -- | -- |
| | 2108/XRL/EDH-Q02 | | 12-Feb-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 7 | 34 | -- | -- | 67 | 8 | <1 | -- | -- |
| | 2108/XRL/EDH-Q02 | +11.77 | 14-Feb-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 16 | 37 | -- | -- | 131 | 6 | <1 | -- | -- |
| | 2108/XRL/EDH-Q02 | | 14-Feb-09 | 4.95-5.85 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 17 | 89 | -- | -- | 180 | 12 | <1 | -- | -- |
| | 2108/XRL/EDH-Q02 | | 14-Feb-09 | 5.85-6.20 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 12 | 95 | -- | -- | 141 | 3 | <1 | -- | -- |
| | 2108/XRL/EDH-Q03 | | 12-Feb-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 4 | 24 | -- | -- | 42 | 16 | <1 | -- | -- |
| | 2108/XRL/EDH-Q03 | | 12-Feb-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 6 | 41 | -- | -- | 66 | 7 | <1 | -- | -- |
| | 2108/XRL/EDH-Q03 | +11.77 | 13-Feb-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 11 | 49 | -- | -- | 142 | 16 | <1 | -- | -- |
| | 2108/XRL/EDH-Q03 | | 13-Feb-09 | 4.95-5.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 23 | 67 | -- | -- | 166 | 12 | <1 | -- | -- |
| | 2108/XRL/EDH-Q03 | | 13-Feb-09 | 6.00-6.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 5 | 48 | -- | -- | 72 | 9 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 8 | 31 | -- | -- | 36 | 39 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 1.50-2.40 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 6 | 44 | -- | -- | 67 | 7 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | +11.80 | 17-Feb-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 11 | 46 | -- | -- | 125 | 7 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 4.95-5.85 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 14 | 86 | -- | -- | 138 | 8 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 5.85-6.75 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 8 | 34 | -- | -- | 59 | 2 | <1 | -- | -- |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 6.75-7.20 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 5 | 56 | -- | -- | 76 | 21 | <1 | -- | -- |
| | 2108/XRL/EDH-Q05E | | 18-Feb-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 13 | 57 | -- | -- | 95 | 32 | 1 | -- | -- |
| | 2108/XRL/EDH-Q05E | | 18-Feb-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 10 | 55 | -- | -- | 120 | 7 | <1 | -- | -- |
| | 2108/XRL/EDH-Q05E | +11.70 | 19-Feb-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 10 | 64 | -- | -- | 155 | 10 | <1 | -- | -- |
| | 2108/XRL/EDH-Q05E | | 19-Feb-09 | 4.95-5.85 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 22 | 51 | -- | -- | 489 | 9 | <1 | -- | -- |
| | 2108/XRL/EDH-Q05E | | 19-Feb-09 | 5.85-6.75 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 9 | 55 | -- | -- | 203 | 16 | <1 | -- | -- |
| H | 2108/XRL/EDH27 | +12.83 | 13-Oct-08 | 0.50 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.3 | 46 | 57 | 0.3 | 27 | 287 | 18 | <1 | <0.1 | <1 |
| | 2108/XRL/EDH28 | +12.90 | 3-Oct-08 | 0.50 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 59 | <0.2 | 14 | 124 | 4 | <1 | 0.2 | 1 |
| | 2108/XRL/D329 | | 25-Sep-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | <1 | 7 | <0.2 | <1 | 149 | <1 | <1 | 0.1 | <1 |
| | 2108/XRL/D329 | +12.62 | 26-Sep-08 | 1.50-1.85 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 6 | 143 | <0.2 | 16 | 158 | 34 | <1 | <0.1 | <1 |
| | 2108/XRL/D329 | | 26-Sep-08 | 3.00-3.33 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 62 | <0.2 | <1 | 1220 | 2 | <1 | <0.1 | <1 |
| M | 2108/XRL/M01 | | 18-Mar-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 55 | <0.2 | 9 | 67 | 15 | <1 | <0.1 | <1 |
| | 2108/XRL/M01 | | 18-Mar-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 6 | 43 | <0.2 | 5 | 76 | 13 | <1 | <0.1 | <1 |
| | 2108/XRL/M01 | +13.70 | 20-Mar-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 50 | 50 | <0.2 | 7 | 227 | 14 | <1 | <0.1 | <1 |
| | 2108/XRL/M01 | | 20-Mar-09 | 4.50-5.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 12 | <0.2 | 4 | 106 | 20 | <1 | <0.1 | <1 |
| | 2108/XRL/M01 | | 20-Mar-09 | 6.00-6.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 7 | 7 | <0.2 | 3 | 69 | 2 | <1 | <0.1 | <1 |
| | 2108/XRL/M02 | | 20-Mar-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 51 | <0.2 | 9 | 72 | 12 | <1 | <0.1 | <1 |
| | 2108/XRL/M02 | | 20-Mar-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 15 | 35 | <0.2 | 6 | 75 | 15 | <1 | <0.1 | <1 |
| | 2108/XRL/M02 | +13.78 | 23-Mar-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 14 | 59 | <0.2 | 6 | 196 | 15 | <1 | <0.1 | <1 |
| | 2108/XRL/M02 | | 23-Mar-09 | 4.50-5.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 161 | <0.2 | 3 | 168 | 9 | <1 | <0.1 | <1 |
| | 2108/XRL/M02 | | 23-Mar-09 | 6.00-6.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 19 | 92 | <0.2 | 4 | 212 | 4 | <1 | <0.1 | <1 |
| | 2108/XRL/M03 | | 18-Mar-09 | 1.00-1.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 7 | 46 | <0.2 | 5 | 84 | 7 | <1 | <0.1 | <1 |
| | 2108/XRL/M03 | | 18-Mar-09 | 2.00-2.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 60 | <0.2 | 4 | 76 | 27 | <1 | <0.1 | <1 |
| | 2108/XRL/M03 | +13.63 | 21-Mar-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 3 | 141 | <0.2 | 3 | 108 | 3 | <1 | <0.1 | <1 |
| | 2108/XRL/M03 | | 21-Mar-09 | 4.50-5.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 1 | 11 | <0.2 | 2 | 18 | 1 | <1 | <0.1 | <1 |
| | 2108/XRL/M03 | | 21-Mar-09 | 6.00-6.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 3 | 76 | <0.2 | 2 | 84 | 3 | <1 | <0.1 | <1 |
| | 2108/XRL/M04 | | 23-Mar-09 | 0.50-1.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 12 | 53 | <0.2 | 8 | 60 | 12 | <1 | <0.1 | <1 |
| | 2108/XRL/M04 | | 23-Mar-09 | 1.50-2.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 9 | 86 | <0.2 | 6 | 61 | 8 | <1 | <0.1 | <1 |
| | 2108/XRL/M04 | +13.74 | 24-Mar-09 | 3.00-3.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 6 | 40 | <0.2 | 5 | 50 | 5 | <1 | <0.1 | <1 |
| | 2108/XRL/M04 | | 24-Mar-09 | 4.50-5.40 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 2 | 23 | <0.2 | 1 | 17 | 2 | <1 | <0.1 | <1 |
| | 2108/XRL/M04 | | 24-Mar-09 | 6.00-6.90 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | <0.2 | 21 | 89 | <0.2 | 3 | 117 | 4 | <1 | <0.1 | <1 |
| D | 2108/XRL/EDH40 | | 24-Oct-08 | 0.50-0.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 17 | 53 | -- | -- | 58 | 16 | <1 | -- | -- |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 1.50-1.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 17 | 64 | -- | -- | 144 | 25 | <1 | -- | -- |
| | 2108/XRL/EDH40 | +3.81 | 24-Oct-08 | 3.00-3.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 12 | 59 | -- | -- | 108 | 18 | <1 | -- | -- |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 4.50-4.95 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 23 | 38 | -- | -- | 233 | 8 | <1 | -- | -- |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 6.00-6.45 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | -- | 13 | 33 | -- | -- | 22 | 6 | <1 | -- | -- |
| Landfill | 2108/XRL/A4a | +31.74 | 5-May-09 | 48.35-48.72 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.3 | 33 | 12 | <0.2 | 5 | 381 | 11 | <1 | -- | <1 |
| | 2108/XRL/A4b | +20.18 | 24-Apr-09 | 36.70-37.15 | Pass | <5 | <0.5 | <0.5 | <5 | <0.5 | <0.5 | <5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <2 | 0.3 | 42 | 50 | <0.2 | 7 | 641 | 11 | <1 | -- | <1 |

Note:
*** indicates that the Csat value exceeds the 'ceiling limit' therefore the RBRG applies
Bold and Shaded indicates exceedance of RBRG Level
Underline indicates exceedance of soil saturation limit
Full analytical results should be referred to laboratory report

Soil Sample Analysis under RBRG Industrial Limit

| Site ID# | Sample ID | Ground level (mPD) | Sampling Date | Sub-sample Depth | Parameters | Petroleum Carbon Ranges C6 – C8 | C9 – C16 | C17 – C35 | SVOC Acenaphthene | Acenaphthylene | Anthracene | Benz(a)anthracene | Benzo(a)pyrene | Benzo(b) & (k) fluoranthene | Benzo(g,h,i)perylene | bis--(2-Ethylhexyl)phthalate | Chrysene | Dibenzo(a,h)anthracene | Fluoranthene | Fluorene | Hexachlorobenzene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Phenol | Pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Reporting Limit (mg/kg) | 5 | 200 | 500 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 1 | 0.5 | 5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| | | | | | RBRG Industrial Limit (mg/kg) | 10000.00 | 10000.00 | 10000.00 | 10000.00 | 10000.00 | 10000.00 | 91.80 | 9.18 | 17.80 | 10000.00 | 91.80 | 1140.00 | 9.18 | 10000.00 | 10000.00 | 0.58 | 91.80 | 453.00 | 10000.00 | 10000.00 | 10000.00 |
| | | | | | Saturation Limit (mg/kg) | 1000 | 3000 | 5000 | 60.2 | 19.8 | 2.56 | NA | NA | NA | NA | NA | NA | NA | NA | 54.7 | NA | NA | 125 | 28 | 7260 | NA |
| | | | | | Unit | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| F | 2108/XRL/EDH29 | +13.19 | 9-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH29 | | 9-Oct-08 | 6.00-6.45 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | +13.06 | 13-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 3.00-3.45 | Pass | 9 | 700 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | | 13-Oct-08 | 6.00-6.45 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH31 | +13.13 | 15-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH31 | | 15-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH31 | | 15-Oct-08 | 6.00-6.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH32 | +13.18 | 11-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH32 | | 11-Oct-08 | 6.00-6.45 | Pass | <5 | <200 | <500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| G | 2108/XRL/EDH33 | +18.91 | 10-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH33 | | 10-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH33 | | 11-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH33 | | 11-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH34 | +18.67 | 13-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH34 | | 13-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH35 | +18.86 | 18-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | 12.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH35 | | 18-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH35 | | 18-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH36 | +18.88 | 15-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH36 | | 15-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH36 | | 16-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| S | 2108/XRL/EDHS01 | +10.79 | 10-Jan-09 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS01 | | 10-Jan-09 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS01 | | 12-Jan-09 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS01 | | 12-Jan-09 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS01 | | 12-Jan-09 | 6.00-6.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS02 | +10.69 | 10-Jan-09 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS02 | | 10-Jan-09 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS02 | | 13-Jan-09 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS02 | | 13-Jan-09 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDHS02 | | 13-Jan-09 | 6.00-6.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Q | 2108/XRL/EDH-Q01 | +11.63 | 17-Feb-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q01 | | 17-Feb-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q01 | | 18-Feb-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <5.0 | <0.5 | <5.0 | <0.5 |
| | 2108/XRL/EDH-Q01 | | 18-Feb-09 | 4.95-5.85 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <5.0 | <0.5 | <5.0 | <0.5 |
| | 2108/XRL/EDH-Q01 | | 18-Feb-09 | 5.85-6.30 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <5.0 | <0.5 | <5.0 | <0.5 |
| | 2108/XRL/EDH-Q02 | +11.77 | 12-Feb-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | 0.9 | 0.8 | <0.5 | 0.7 | 1.1 | 0.7 | <5 | <0.5 | 0.6 | <0.5 | <0.5 | <0.2 | 0.6 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q02 | | 12-Feb-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q02 | | 14-Feb-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q02 | | 14-Feb-09 | 4.95-5.85 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q02 | | 14-Feb-09 | 5.85-6.20 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q03 | +11.77 | 12-Feb-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q03 | | 12-Feb-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q03 | | 13-Feb-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q03 | | 13-Feb-09 | 4.95-5.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q03 | | 13-Feb-09 | 6.00-6.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | +11.80 | 17-Feb-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 1.50-2.40 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <200 | 2630 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | **2540** | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 4.95-5.85 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | 31.1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 5.85-6.75 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q04 | | 17-Feb-09 | 6.75-7.20 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q05E | +11.70 | 18-Feb-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <5.0 | <0.5 | <5.0 | <0.5 |
| | 2108/XRL/EDH-Q05E | | 18-Feb-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | 68.1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <5.0 | <0.5 | <5.0 | <0.5 |
| | 2108/XRL/EDH-Q05E | | 19-Feb-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q05E | | 19-Feb-09 | 4.95-5.85 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <200 | 2630 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | **356** | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH-Q05E | | 19-Feb-09 | 5.85-6.75 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| H | 2108/XRL/EDH27 | +12.83 | 13-Oct-08 | 0.50 | Fail on bis--(2-Ethylhexyl)phthalate | <5 | <200 | 1950 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | **134** | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH28 | +12.90 | 3-Oct-08 | 0.50 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/D329 | +12.62 | 25-Sep-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/D329 | | 26-Sep-08 | 1.50-1.85 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/D329 | | 26-Sep-08 | 3.00-3.33 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| M | 2108/XRL/M01 | +13.70 | 18-Mar-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M01 | | 18-Mar-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M01 | | 20-Mar-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M01 | | 20-Mar-09 | 4.50-5.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M01 | | 20-Mar-09 | 6.00-6.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M02 | +13.78 | 20-Mar-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M02 | | 20-Mar-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M02 | | 23-Mar-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M02 | | 23-Mar-09 | 4.50-5.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M02 | | 23-Mar-09 | 6.00-6.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M03 | +13.63 | 18-Mar-09 | 1.00-1.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M03 | | 18-Mar-09 | 2.00-2.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M03 | | 21-Mar-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M03 | | 21-Mar-09 | 4.50-5.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M03 | | 21-Mar-09 | 6.00-6.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M04 | +13.74 | 23-Mar-09 | 0.50-1.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M04 | | 23-Mar-09 | 1.50-2.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M04 | | 24-Mar-09 | 3.00-3.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M04 | | 24-Mar-09 | 4.50-5.40 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/M04 | | 24-Mar-09 | 6.00-6.90 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| D | 2108/XRL/EDH40 | +3.81 | 24-Oct-08 | 0.50-0.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 1.50-1.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 3.00-3.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 4.50-4.95 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/EDH40 | | 24-Oct-08 | 6.00-6.45 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Landfill | 2108/XRL/A4a | +31.74 | 5-May-09 | 48.35-48.72 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 2108/XRL/A4b | +20.18 | 24-Apr-09 | 36.70-37.15 | Pass | <5 | <200 | <500 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <1 | <0.5 | <5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

Note:
*** indicates that the Csat value exceeds the 'ceiling limit' therefore the RBRG applies
Bold and Shaded indicates exceedance of RBRG Level
Underline indicates exceedance of soil saturation limit
Full analytical results should be referred to laboratory report

Groundwater Sample Analysis under RBRG Industrial Limit

| | | | Metals | TPH | | | VOCs | | | | | | | | | | | | | | SVOCs | | | | | | | | | | | PCB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site ID | Sampling Location | Sampling Date | Parameters | Mercury | C6 – C8 | C9 – C16 | C17 – C35 | Benzene | Toluene | Ethylbenzene | meta- & para Xylene | ortho-Xylene | Total Xylene | Styrene | Acetone | 2-Butanone (MEK) | Methylene chloride | Trichloroethene | Tetrachloroethene | Chloroform | Bromodichloromethane | Methyl tert-Butyl Ether (MTBE) | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Chrysene | Benzo(b) & Benzo(k)fluoranthene | Hexachlorobenzene (HCB) | Total Polychlorinated biphenyls |
| | | | RBRG Industrial limit (ug/L) | 6,790 | 1,150,000 | 9,980,000 | 178,000 | 54,000 | 10,000,000 | 10,000,000 | - | - | 1,570,000 | 10,000,000 | 10,000,000 | 10,000,000 | 224,000 | 14,200 | 2,950 | 11,300 | 26,200 | 1,810,000 | 862,000 | 10,000,000 | 10,000,000 | 10,000,000 | 10,000,000 | 10,000,000 | 10,000,000 | 10,000,000 | 812,000 | 7,530 | 695 | 5,110 |
| | | | Csat (ug/L) | NA | 5,230 | 2,800 | 2,800 | 1,750,000 | 526,000 | 169,000 | - | - | 175,000 | 310,000 | *** | *** | *** | 1,100,000 | 200,000 | 7,920,000 | 6,740,000 | *** | 31,000 | 3,930 | 4,240 | 1,980 | 1,000 | 43 | 206 | 135 | 2 | 2 | 6,200 | 31 |
| | | | Unit | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| D | 2108/XRL/EDH40 | 24-Oct-08 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | <5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | -- |
| F | 2108/XRL/EDH29 | 9-Oct-08 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH30 | 14-Oct-08 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2108/XRL/EDH31 | 16-Oct-08 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | 8 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | -- |
| | 2108/XRL/EDH32 | 11-Oct-08 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| G | 2108/XRL/EDH33 | 11-Oct-08 | Pass | <0.05 | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | <5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | <0.1 |
| | 2108/XRL/EDH34 | 14-Oct-08 | Pass | <0.05 | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | 5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | <0.1 |
| | 2108/XRL/EDH35 | 18-Oct-08 | Pass | <0.05 | <20 | <500 | 1100 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | <5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | <0.1 |
| | 2108/XRL/EDH36 | 16-Oct-08 | Pass | <0.05 | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | <5 | <50 | <50 | <50 | <5 | <5 | 6 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | <0.1 |
| S | 2108/XRL/EDHS01 | 12-Jan-09 | Pass | -- | <20 | <500 | 600 | <5 | <5 | <5 | <10 | <5 | <15 | -- | <50 | <50 | <50 | <5 | <5 | <5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | -- |
| | 2108/XRL/EDHS02 | 13-Jan-09 | Pass | -- | <20 | <500 | <500 | <5 | <5 | <5 | <10 | <5 | <15 | -- | <50 | <50 | <50 | <5 | <5 | <5 | <5 | <5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <4 | <4 | -- |

Note:
*** indicates that the the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies
Bold and shaded indicates exceedance of RBRG Level
Underline indicates exceedance of soil saturation limit
Full analytical results should be referred to laboratory report

**Standard Forms 3.2 – 3.5 Adopted from Guidance Manual**

Standard Form 3.2 – Soil Data Summary and Comparison to RBRGs and Csat

| Chemical | Frequency of detection (x/y) | Range of Detected Concentration | Range of Method Reporting Limit | Analytical Method | Relevant Land Use Categories | Lowest RBRG(s) (mg/kg) | Csat (mg/kg) | Maximum Detected Concentration Exceeds (check if applicable) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | RBRG | Csat |
| **Volatile Organic Chemicals** | | | | | | | | | |
| Acetone | 0/85 | <5 | 5 | USEPA 8260 | Industrial | 10000 | *** | NA | NA |
| Benzene | 0/100 | <0.5 | 0.5 | | | 9.21 | 336 | NA | NA |
| Bromodichloromethane | 0/85 | <0.5 | 0.5 | | | 2.85 | 1030 | NA | NA |
| 2-Butanone | 0/85 | <5 | 5 | | | 10000 | *** | NA | NA |
| Chloroform | 0/85 | <0.5 | 0.5 | | | 1.54 | 1100 | NA | NA |
| Ethylbenzene | 0/100 | <0.5 | 0.5 | | | 8240 | 138 | NA | NA |
| Methyl tert-Butyl Ether | 0/85 | <5 | 5 | | | 70.1 | 2380 | NA | NA |
| Methylene Chloride | 0/85 | <5 | 5 | | | 13.9 | 921 | NA | NA |
| Styrene | 0/85 | <0.5 | 0.5 | | | 10000 | 497 | NA | NA |
| Tetrachloroethene | 0/85 | <0.5 | 0.5 | | | 0.777 | 97.1 | NA | NA |
| Toluene | 0/100 | <0.5 | 0.5 | | | 10000 | 235 | NA | NA |
| Trichloroethene | 0/85 | <0.5 | 0.5 | | | 5.68 | 488 | NA | NA |
| Xylenes (Total) | 0/100 | <2 | 2 | | | 1230 | 150 | NA | NA |
| **Semi-Volatile Organic Chemicals** | | | | | | | | | |
| Acenaphthene | 0/85 | <0.5 | 0.5 | USEPA 8270 | Industrial | 10000 | 60.2 | NA | NA |
| Acenaphthylene | 0/85 | <0.5 | 0.5 | | | 10000 | 19.8 | NA | NA |
| Anthracene | 0/85 | <0.5 | 0.5 | | | 10000 | 2.56 | NA | NA |
| Benzo(a)anthracene | 0/85 | <0.5 | 0.5 | | | 91.8 | NA | NA | NA |
| Benzo(a)pyrene | 1/85 | <0.7 | 0.5 | | | 9.18 | NA | NIL | NIL |
| Benzo(b) & Benzo(k) fluoranthene | 1/85 | <1.1 | 1 | | | 17.8 | NA | NIL | NIL |
| Benzo(g,h,i)perylene | 1/85 | <0.7 | 0.5 | | | 10000 | NA | NIL | NIL |
| bis-(2-Ethylhexyl)phthalate | 6/85 | 14.2-2540 | 5 | | | 91.8 | NA | ✔ | NA |
| Chrysene | 0/85 | <0.5 | 0.5 | | | 1140 | NA | NA | NA |
| Dibenzo(a,h)anthracene | 1/85 | <0.6 | 0.5 | | | 9.18 | NA | NIL | NIL |
| Fluoranthene | 0/85 | <0.5 | 0.5 | | | 10000 | NA | NA | NA |
| Fluorene | 0/85 | <0.5 | 0.5 | | | 10000 | 54.7 | NA | NA |
| Hexachlorobenzene | 0/85 | <0.2 | 0.2 | | | 0.582 | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1/85 | <0.6 | 0.5 | | | 91.8 | NA | NIL | NIL |
| Naphthalene | 0/85 | <0.5 | 0.5 | | | 453 | 125 | NA | NA |
| Phenanthrene | 0/85 | <0.5 | 0.5 | | | 10000 | 28 | NA | NA |
| Phenol | 0/85 | <0.5 | 0.5 | | | 10000 | 7260 | NA | NA |
| Pyrene | 0/85 | <0.5 | 0.5 | | | 10000 | NA | NA | NA |
| **Metals** | | | | | | | | | |
| Antimony | 0 | -- | -- | USEPA 6020 | Industrial | 261 | NA | NA | NA |
| Arsenic | 0 | -- | -- | | | 196 | NA | NA | NA |
| Barium | 0 | -- | -- | | | 10000 | NA | NA | NA |
| Cadmium | 6/41 | 0.3-0.4 | 0.2 | | | 653 | NA | NIL | NIL |
| Chromium III | 85/85 | 1-39 | 1 | | | 10000 | NA | NIL | NIL |
| Chromium VI | 1/85 | <1 | 1 | | | 1960 | NA | NIL | NIL |
| Cobalt | 0 | -- | -- | | | 10000 | NA | NA | NA |
| Copper | 84/85 | 1-55 | 1 | | | 10000 | NA | NIL | NIL |
| Lead | 100/100 | 7-509 | 1 | | | 2290 | NA | NIL | NIL |
| Manganese | 0 | -- | -- | | | 10000 | NA | NA | NA |
| Mercury | 1/41 | <0.3 | 0.2 | | | 38.4 | NA | NIL | NIL |
| Molybdenum | 0 | -- | -- | | | 3260 | NA | NA | NA |
| Nickel | 39/41 | 1-27 | 1 | | | 10000 | NA | NIL | NIL |
| Tin | 0 | -- | -- | | | 10000 | NA | NA | NA |
| Zinc | 85/85 | 17-1220 | 1 | | | 10000 | NA | NIL | NIL |
| **Petroleum Carbon Ranges** | | | | | | | | | |
| C6 - C8 | 1/100 | <9 | 5 | USEPA 8015 | Industrial | 10000 | 1000 | NIL | NIL |
| C9 - C16 | 1/100 | <700 | 200 | | | 10000 | 3000 | NIL | NIL |
| C17 - C35 | 3/100 | 1950-2630 | 500 | | | 10000 | 5000 | NIL | NIL |
| **PCBs** | | | | | | | | | |
| PCBs | 2/41 | 0.1-0.2 | 0.1 | USEPA 8070 | Industrial | 0.748 | NA | NIL | NIL |
| **Other Inorganic Compound** | | | | | | | | | |
| Cyanide, free | 1/41 | <1 | 1 | Alpha 4500CD: C &E | Industrial | 10000 | NA | NIL | NIL |

Note:

*** indicates that the Csat value exceeds the 'ceiling limit' therefore the RBRG applies

NIL= Maximum concentration detected is below repective RBRG or solubility limit

NA= Not Applicable

Standard Form 3.3 – Groundwater Data Summary and Comparison to RBRGs and solubility limit

| Chemical | Frequency of detection (x/y) | Range of Detected Concentration (µg/L) | Range of Method Reporting Limit (µg/L) | Analytical Method | Relevant Land Use Categories | Lowest RBRG(s) (ug/kg) | Solubility Limit (ug/L) | Maximum Detected Concentration Exceeds (check if applicable) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | RBRG | Solubility |
| **Volatile Organic Chemicals** | | | | | | | | | |
| Acetone | 0/8 | <50 | 50 | USEPA 8260 | Industrial | 10000000 | *** | NA | NA |
| Benzene | 0/11 | <5 | 5 | | | 54000 | 1750000 | NA | NA |
| Bromodichloromethane | 0/8 | <5 | 5 | | | 26200 | 6740000 | NA | NA |
| 2-Butanone | 0/8 | <50 | 50 | | | 10000000 | *** | NA | NA |
| Chloroform | 3/8 | <5-8 | 5 | | | 11300 | 7920000 | NIL | NIL |
| Ethylbenzene | 0/11 | <5 | 5 | | | 10000000 | 169000 | NA | NA |
| Methyl tert-Butyl Ether | 0/8 | <5 | 5 | | | 1810000 | *** | NA | NA |
| Methylene Chloride | 0/8 | <50 | 50 | | | 224000 | *** | NA | NA |
| Styrene | 0/8 | <5 | 5 | | | 10000000 | 310000 | NA | NA |
| Tetrachloroethene | 0/8 | <5 | 5 | | | 2950 | 200000 | NA | NA |
| Toluene | 0/11 | <5 | 5 | | | 10000000 | 526000 | NA | NA |
| Trichloroethene | 0/8 | <5 | 5 | | | 14200 | 1100000 | NA | NA |
| Xylenes (Total) | 0/8 | <15 | 15 | | | 1570000 | 175000 | NA | NA |
| **Semi-Volatile Organic Chemicals** | | | | | | | | | |
| Acenaphthene | 0/8 | <2 | 2 | USEPA 8270 | Industrial | 10000000 | 4240 | NA | NA |
| Acenaphthylene | 0/8 | <2 | 2 | | | 10000000 | 3930 | NA | NA |
| Anthracene | 0/8 | <2 | 2 | | | 10000000 | 43.4 | NA | NA |
| Benzo(b) & Benzo(k) fluoranthene | 0/8 | <4 | 4 | | | 7530 | 1.5 | NA | NA |
| Chrysene | 0/8 | <2 | 2 | | | 812000 | 1.6 | NA | NA |
| Fluoranthene | 0/8 | <2 | 2 | | | 10000000 | 206 | NA | NA |
| Fluorene | 0/8 | <2 | 2 | | | 10000000 | 1980 | NA | NA |
| Hexachlorobenzene | 0/8 | <4 | 4 | | | 695 | 6200 | NA | NA |
| Naphthalene | 0/8 | <2 | 2 | | | 862000 | 31000 | NA | NA |
| Phenanthrene | 0/8 | <2 | 2 | | | 10000000 | 1000 | NA | NA |
| Pyrene | 0/8 | <2 | 2 | | | 10000000 | 135 | NA | NA |
| **Metals** | | | | | | | | | |
| Mercury | 0/4 | <0.05 | 0.05 | USEPA 6020 | Industrial | 6790 | NA | NA | NA |
| **Petroleum Carbon Ranges** | | | | | | | | | |
| C6 - C8 | 0/11 | <20 | 20 | USEPA 8015 | Industrial | 1150000 | 5230 | NA | NA |
| C9 - C16 | 0/11 | <500 | 500 | | | 9980000 | 2800 | NA | NA |
| C17 - C35 | 2/11 | 600/1100 | 500 | | | 178000 | 2800 | NIL | NIL |
| **PCBs** | | | | | | | | | |
| PCBs | 0/4 | <0.1 | 0.1 | USEPA 8070 | Industrial | 5110 | NA | NA | NA |
| **Other Inorganic Compound** | | | | | | | | | |
| Cyanide, free | 0 | <1 | 1 | Alpha 4500CD: C &E | Industrial | 10000 | NA | NA | NA |

Note:

*** indicates that the Csat value exceeds the 'ceiling limit' therefore the RBRG applies

NIL= Maximum concentration detected is below repective RBRG or solubility limit

NA= Not Applicable

Standard Form 3.4 – Soil Sample Concentrations and Exceedances of RBRGs and Csat

| Chemical | List Samples | | Concentration (mg/kg) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area* ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| **Volatile Organic Chemicals** | | | | | | |
| Acetone | NA | NA | ND | NA | NA | NA |
| Benzene | NA | NA | ND | NA | NA | NA |
| Bromodichloromethane | NA | NA | ND | NA | NA | NA |
| 2-Butanone | NA | NA | ND | NA | NA | NA |
| Chloroform | NA | NA | ND | NA | NA | NA |
| Ethylbenzene | NA | NA | ND | NA | NA | NA |
| Methyl tert-Butyl Ether | NA | NA | ND | NA | NA | NA |
| Methylene Chloride | NA | NA | ND | NA | NA | NA |
| Styrene | NA | NA | ND | NA | NA | NA |
| Tetrachloroethene | NA | NA | ND | NA | NA | NA |
| Toluene | NA | NA | ND | NA | NA | NA |
| Trichloroethene | NA | NA | ND | NA | NA | NA |
| Xylenes (Total) | NA | NA | ND | NA | NA | NA |
| **Semi-Volatile Organic Chemicals** | | | | | | |
| Acenaphthene | NA | NA | ND | NA | NA | NA |
| Acenaphthylene | NA | NA | ND | NA | NA | NA |
| Anthracene | NA | NA | ND | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | ND | NA | NA | NA |
| Benzo(a)pyrene | 2108/XRL/EDH-Q02 | 0.50-1.40 | 0.7 | NIL | NIL | NA |
| Benzo(b) & Benzo(k) fluoranthene | 2108/XRL/EDH-Q02 | 0.50-1.40 | 1.1 | NIL | NIL | NA |
| Benzo(g,h,i)perylene | 2108/XRL/EDH-Q02 | 0.50-1.40 | 0.7 | NIL | NIL | NA |
| bis-(2-Ethylhexyl)phthalate | 2108/XRL/EDH35 | 0.50-1.95 | 12.2 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 1.50-2.40 | 2540 | ✔ | NA | 25 |
| | 2108/XRL/EDH-Q04 | 4.95-5.85 | 31.1 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 1.50-2.40 | 68.1 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 356 | ✔ | NIL | 25 |
| | 2108/XRL/EDH27 | 0.50 | 134 | ✔ | NIL | 25 |
| Chrysene | NA | NA | ND | NA | NA | NA |
| Dibenzo(a,h)anthracene | 2108/XRL/EDH-Q02 | 0.50-1.40 | 0.6 | NIL | NIL | NA |
| Fluoranthene | NA | NA | ND | NA | NA | NA |
| Fluorene | NA | NA | ND | NA | NA | NA |
| Hexachlorobenzene | NA | NA | ND | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2108/XRL/EDH-Q02 | 0.50-1.40 | 0.6 | NIL | NIL | NA |
| Naphthalene | NA | NA | ND | NA | NA | NA |
| Phenanthrene | NA | NA | ND | NA | NA | NA |
| Phenol | NA | NA | ND | NA | NA | NA |
| Pyrene | NA | NA | ND | NA | NA | NA |
| **Metals** | | | | | | |
| Nickel | 2108/XRL/EDH33 | 0.50-0.95 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 1.50-1.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 3 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 4.50-4.95 | 2 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 1.50-1.95 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 3.00-3.45 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 4.50-4.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 0.50-0.95 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 1.50-1.95 | 3 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 6.00-6.45 | 5 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 0.50-0.95 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 1.50-1.95 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 4.50-4.95 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 27 | NIL | NIL | NA |
| | 2108/XRL/EDH28 | 0.50 | 14 | NIL | NIL | NA |
| | 2108/XRL/D329 | 1.50-1.85 | 16 | NIL | NIL | NA |
| | 2108/XRL/D329 | 3.00-3.33 | <1 | NIL | NIL | NA |
| | 2108/XRL/M01 | 0.50-1.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/M01 | 1.50-2.40 | 5 | NIL | NIL | NA |
| | 2108/XRL/M01 | 3.00-3.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/M01 | 4.50-5.40 | 4 | NIL | NIL | NA |
| | 2108/XRL/M01 | 6.00-6.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M02 | 0.50-1.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/M02 | 1.50-2.40 | 6 | NIL | NIL | NA |
| | 2108/XRL/M02 | 3.00-3.90 | 6 | NIL | NIL | NA |
| | 2108/XRL/M02 | 4.50-5.40 | 3 | NIL | NIL | NA |
| | 2108/XRL/M02 | 6.00-6.90 | 4 | NIL | NIL | NA |
| | 2108/XRL/M03 | 1.00-1.90 | 5 | NIL | NIL | NA |
| | 2108/XRL/M03 | 2.00-2.90 | 4 | NIL | NIL | NA |
| | 2108/XRL/M03 | 3.00-3.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M03 | 4.50-5.40 | 2 | NIL | NIL | NA |
| | 2108/XRL/M03 | 6.00-6.90 | 2 | NIL | NIL | NA |
| | 2108/XRL/M04 | 0.50-1.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/M04 | 1.50-2.40 | 6 | NIL | NIL | NA |
| | 2108/XRL/M04 | 3.00-3.90 | 5 | NIL | NIL | NA |
| | 2108/XRL/M04 | 4.50-5.40 | 1 | NIL | NIL | NA |
| | 2108/XRL/M04 | 6.00-6.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 5 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 7 | NIL | NIL | NA |

| Chemical | List Samples | | Concentration (mg/kg) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area* ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| Antimony | NA | NA | NA | NA | NA | NA |
| Arsenic | NA | NA | NA | NA | NA | NA |
| Barium | NA | NA | NA | NA | NA | NA |
| Cadmium | 2108/XRL/EDH33 | 0.50-0.95 | 0.3 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 0.3 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 0.4 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 0.3 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 0.3 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 0.3 | NIL | NIL | NA |
| Manganese | NA | NA | NA | NIL | NIL | NA |
| Mercury | 2108/XRL/EDH27 | 0.50 | 0.3 | NIL | NIL | NA |
| Molybdenum | NA | NA | NA | NIL | NIL | NA |
| Tin | NA | NA | NA | NA | NA | NA |
| Chromium III | 2108/XRL/EDH31 | 0.50-0.95 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 1.50-1.95 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 6.00-6.45 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 0.50-0.95 | 23 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 1.50-1.95 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 4.50-4.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 1.50-1.95 | 17 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 3.00-3.45 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 4.50-4.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 0.50-0.95 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 1.50-1.95 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 6.00-6.45 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 0.50-0.95 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 1.50-1.95 | 20 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 4.50-4.95 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 0.50-0.95 | 5 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 1.50-1.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 3.00-3.45 | 5 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 4.50-4.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 6.00-6.45 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 0.50-0.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 1.50-1.95 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 3.00-3.45 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 4.50-4.95 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 6.00-6.45 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 0.50-1.40 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 1.50-2.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 3.00-3.90 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 4.95-5.85 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 5.85-6.30 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 0.50-1.40 | 15 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 1.50-2.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 3.00-3.90 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 4.95-5.85 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 5.85-6.20 | 3 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 0.50-1.40 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 1.50-2.40 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 3.00-3.90 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 4.95-5.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 6.00-6.90 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 0.50-1.40 | 39 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 1.50-2.40 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 3.00-3.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 4.95-5.85 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 5.85-6.75 | 2 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 6.75-7.20 | 21 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 0.50-1.40 | 32 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 1.50-2.40 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 3.00-3.90 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 5.85-6.75 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 18 | NIL | NIL | NA |
| | 2108/XRL/EDH28 | 0.50 | 4 | NIL | NIL | NA |
| | 2108/XRL/D329 | 1.50-1.85 | 34 | NIL | NIL | NA |
| | 2108/XRL/D329 | 3.00-3.33 | 2 | NIL | NIL | NA |
| | 2108/XRL/M01 | 0.50-1.40 | 15 | NIL | NIL | NA |
| | 2108/XRL/M01 | 1.50-2.40 | 13 | NIL | NIL | NA |
| | 2108/XRL/M01 | 3.00-3.90 | 14 | NIL | NIL | NA |
| | 2108/XRL/M01 | 4.50-5.40 | 20 | NIL | NIL | NA |
| | 2108/XRL/M01 | 6.00-6.90 | 2 | NIL | NIL | NA |
| | 2108/XRL/M02 | 0.50-1.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M02 | 1.50-2.40 | 15 | NIL | NIL | NA |
| | 2108/XRL/M02 | 3.00-3.90 | 15 | NIL | NIL | NA |
| | 2108/XRL/M02 | 4.50-5.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/M02 | 6.00-6.90 | 4 | NIL | NIL | NA |
| | 2108/XRL/M03 | 1.00-1.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/M03 | 2.00-2.90 | 27 | NIL | NIL | NA |
| | 2108/XRL/M03 | 3.00-3.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M03 | 4.50-5.40 | 1 | NIL | NIL | NA |
| | 2108/XRL/M03 | 6.00-6.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M04 | 0.50-1.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M04 | 1.50-2.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/M04 | 3.00-3.90 | 5 | NIL | NIL | NA |
| | 2108/XRL/M04 | 4.50-5.40 | 2 | NIL | NIL | NA |
| | 2108/XRL/M04 | 6.00-6.90 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 0.50-0.95 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 1.50-1.95 | 25 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 3.00-3.45 | 18 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 4.50-4.95 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 6.00-6.45 | 6 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 11 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 11 | NIL | NIL | NA |
| Chromium VI | 2108/XRL/EDH-Q05E | 0.50-1.40 | 1 | NIL | NIL | NA |

| Chemical | List Samples | | Concentration (mg/kg) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area* ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| Cobalt | NA | NA | NA | NA | NA | NA |
| | 2108/XRL/EDH31 | 0.50-0.95 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 1.50-1.95 | 17 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 6.00-6.45 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 0.50-0.95 | 19 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 1.50-1.95 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 15 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 4.50-4.95 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 50 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 1.50-1.95 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 3.00-3.45 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 4.50-4.95 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 0.50-0.95 | 30 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 1.50-1.95 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 6.00-6.45 | 15 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 0.50-0.95 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 1.50-1.95 | 23 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 4.50-4.95 | 30 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 0.50-0.95 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 1.50-1.95 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 3.00-3.45 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 4.50-4.95 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 6.00-6.45 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 0.50-0.95 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 1.50-1.95 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 3.00-3.45 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 4.50-4.95 | 30 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 6.00-6.45 | 33 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 0.50-1.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 1.50-2.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 3.00-3.90 | 14 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 4.95-5.85 | 41 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 5.85-6.30 | 24 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 0.50-1.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 1.50-2.40 | 7 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 3.00-3.90 | 16 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 4.95-5.85 | 17 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 5.85-6.20 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 0.50-1.40 | 4 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 1.50-2.40 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 3.00-3.90 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 4.95-5.40 | 23 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 6.00-6.90 | 5 | NIL | NIL | NA |
| Copper | 2108/XRL/EDH-Q04 | 0.50-1.40 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 1.50-2.40 | 6 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 3.00-3.90 | 11 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 4.95-5.85 | 14 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 5.85-6.75 | 8 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 6.75-7.20 | 5 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 0.50-1.40 | 13 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 1.50-2.40 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 3.00-3.90 | 10 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 22 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 5.85-6.75 | 9 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDH28 | 0.50 | 12 | NIL | NIL | NA |
| | 2108/XRL/D329 | 1.50-1.85 | 6 | NIL | NIL | NA |
| | 2108/XRL/D329 | 3.00-3.33 | 9 | NIL | NIL | NA |
| | 2108/XRL/M01 | 0.50-1.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/M01 | 1.50-2.40 | 6 | NIL | NIL | NA |
| | 2108/XRL/M01 | 3.00-3.90 | 50 | NIL | NIL | NA |
| | 2108/XRL/M01 | 4.50-5.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M01 | 6.00-6.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/M02 | 0.50-1.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M02 | 1.50-2.40 | 15 | NIL | NIL | NA |
| | 2108/XRL/M02 | 3.00-3.90 | 14 | NIL | NIL | NA |
| | 2108/XRL/M02 | 4.50-5.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M02 | 6.00-6.90 | 19 | NIL | NIL | NA |
| | 2108/XRL/M03 | 1.00-1.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/M03 | 2.00-2.90 | 9 | NIL | NIL | NA |
| | 2108/XRL/M03 | 3.00-3.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M03 | 4.50-5.40 | 1 | NIL | NIL | NA |
| | 2108/XRL/M03 | 6.00-6.90 | 3 | NIL | NIL | NA |
| | 2108/XRL/M04 | 0.50-1.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M04 | 1.50-2.40 | 9 | NIL | NIL | NA |
| | 2108/XRL/M04 | 3.00-3.90 | 6 | NIL | NIL | NA |
| | 2108/XRL/M04 | 4.50-5.40 | 2 | NIL | NIL | NA |
| | 2108/XRL/M04 | 6.00-6.90 | 21 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 0.50-0.95 | 17 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 1.50-1.95 | 17 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 3.00-3.45 | 12 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 4.50-4.95 | 23 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 6.00-6.45 | 13 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 33 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 42 | NIL | NIL | NA |

| Chemical | List Samples | | Concentration (mg/kg) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area* ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| Lead | 2108/XRL/EDH29 | 0.50-0.95 | 57 | NIL | NIL | NA |
| | 2108/XRL/EDH29 | 1.50-1.95 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDH29 | 3.00-3.45 | 84 | NIL | NIL | NA |
| | 2108/XRL/EDH29 | 4.50-4.95 | 43 | NIL | NIL | NA |
| | 2108/XRL/EDH29 | 6.00-6.45 | 123 | NIL | NIL | NA |
| | 2108/XRL/EDH30 | 0.50-0.95 | 91 | NIL | NIL | NA |
| | 2108/XRL/EDH30 | 1.50-1.95 | 50 | NIL | NIL | NA |
| | 2108/XRL/EDH30 | 3.00-3.45 | 75 | NIL | NIL | NA |
| | 2108/XRL/EDH30 | 4.50-4.95 | 509 | NIL | NIL | NA |
| | 2108/XRL/EDH30 | 6.00-6.45 | 14 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 0.50-0.95 | 110 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 1.50-1.95 | 74 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 6.00-6.45 | 30 | NIL | NIL | NA |
| | 2108/XRL/EDH32 | 0.50-0.95 | 32 | NIL | NIL | NA |
| | 2108/XRL/EDH32 | 1.50-1.95 | 61 | NIL | NIL | NA |
| | 2108/XRL/EDH32 | 3.00-3.45 | 107 | NIL | NIL | NA |
| | 2108/XRL/EDH32 | 4.50-4.95 | 44 | NIL | NIL | NA |
| | 2108/XRL/EDH32 | 6.00-6.45 | 28 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 0.50-0.95 | 59 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 1.50-1.95 | 139 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 155 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 4.50-4.95 | 86 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 36 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 1.50-1.95 | 40 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 3.00-3.45 | 54 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 4.50-4.95 | 35 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 0.50-0.95 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 1.50-1.95 | 23 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 6.00-6.45 | 63 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 0.50-0.95 | 30 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 1.50-1.95 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 4.50-4.95 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 0.50-0.95 | 69 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 1.50-1.95 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 3.00-3.45 | 69 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 4.50-4.95 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 6.00-6.45 | 105 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 0.50-0.95 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 1.50-1.95 | 105 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 3.00-3.45 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 4.50-4.95 | 60 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 6.00-6.45 | 38 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 0.50-1.40 | 41 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 1.50-2.40 | 62 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 3.00-3.90 | 71 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 4.95-5.85 | 74 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 5.85-6.30 | 98 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 0.50-1.40 | 44 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 1.50-2.40 | 34 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 3.00-3.90 | 37 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 4.95-5.85 | 89 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 5.85-6.20 | 95 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 0.50-1.40 | 24 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 1.50-2.40 | 41 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 3.00-3.90 | 49 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 4.95-5.40 | 67 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 6.00-6.90 | 48 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 0.50-1.40 | 31 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 1.50-2.40 | 44 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 3.00-3.90 | 46 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 4.95-5.85 | 86 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 5.85-6.75 | 34 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 6.75-7.20 | 56 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 0.50-1.40 | 57 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 1.50-2.40 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 3.00-3.90 | 64 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 51 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 5.85-6.75 | 55 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 57 | NIL | NIL | NA |
| | 2108/XRL/EDH28 | 0.50 | 59 | NIL | NIL | NA |
| | 2108/XRL/D329 | 0.50-0.95 | 7 | NIL | NIL | NA |
| | 2108/XRL/D329 | 1.50-1.85 | 143 | NIL | NIL | NA |
| | 2108/XRL/D329 | 3.00-3.33 | 62 | NIL | NIL | NA |
| | 2108/XRL/M01 | 0.50-1.40 | 55 | NIL | NIL | NA |
| | 2108/XRL/M01 | 1.50-2.40 | 43 | NIL | NIL | NA |
| | 2108/XRL/M01 | 3.00-3.90 | 50 | NIL | NIL | NA |
| | 2108/XRL/M01 | 4.50-5.40 | 12 | NIL | NIL | NA |
| | 2108/XRL/M01 | 6.00-6.90 | 7 | NIL | NIL | NA |
| | 2108/XRL/M02 | 0.50-1.40 | 51 | NIL | NIL | NA |
| | 2108/XRL/M02 | 1.50-2.40 | 35 | NIL | NIL | NA |
| | 2108/XRL/M02 | 3.00-3.90 | 59 | NIL | NIL | NA |
| | 2108/XRL/M02 | 4.50-5.40 | 161 | NIL | NIL | NA |
| | 2108/XRL/M02 | 6.00-6.90 | 92 | NIL | NIL | NA |
| | 2108/XRL/M03 | 1.00-1.90 | 46 | NIL | NIL | NA |
| | 2108/XRL/M03 | 2.00-2.90 | 60 | NIL | NIL | NA |
| | 2108/XRL/M03 | 3.00-3.90 | 141 | NIL | NIL | NA |
| | 2108/XRL/M03 | 4.50-5.40 | 11 | NIL | NIL | NA |
| | 2108/XRL/M03 | 6.00-6.90 | 76 | NIL | NIL | NA |
| | 2108/XRL/M04 | 0.50-1.40 | 53 | NIL | NIL | NA |
| | 2108/XRL/M04 | 1.50-2.40 | 86 | NIL | NIL | NA |
| | 2108/XRL/M04 | 3.00-3.90 | 40 | NIL | NIL | NA |
| | 2108/XRL/M04 | 4.50-5.40 | 23 | NIL | NIL | NA |
| | 2108/XRL/M04 | 6.00-6.90 | 89 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 0.50-0.95 | 53 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 1.50-1.95 | 64 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 3.00-3.45 | 59 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 4.50-4.95 | 38 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 6.00-6.45 | 33 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 12 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 50 | NIL | NIL | NA |

| Chemical | List Samples | | Concentration (mg/kg) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area* ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| Zinc | 2108/XRL/EDH31 | 0.50-0.95 | 337 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 1.50-1.95 | 118 | NIL | NIL | NA |
| | 2108/XRL/EDH31 | 6.00-6.45 | 250 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 0.50-0.95 | 169 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 1.50-1.95 | 98 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 3.00-3.45 | 241 | NIL | NIL | NA |
| | 2108/XRL/EDH33 | 4.50-4.95 | 87 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 0.50-0.95 | 209 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 1.50-1.95 | 84 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 3.00-3.45 | 262 | NIL | NIL | NA |
| | 2108/XRL/EDH34 | 4.50-4.95 | 168 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 0.50-0.95 | 130 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 1.50-1.95 | 140 | NIL | NIL | NA |
| | 2108/XRL/EDH35 | 6.00-6.45 | 117 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 0.50-0.95 | 70 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 1.50-1.95 | 82 | NIL | NIL | NA |
| | 2108/XRL/EDH36 | 4.50-4.95 | 130 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 0.50-0.95 | 198 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 1.50-1.95 | 226 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 3.00-3.45 | 198 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 4.50-4.95 | 226 | NIL | NIL | NA |
| | 2108/XRL/EDHS01 | 6.00-6.45 | 273 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 0.50-0.95 | 226 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 1.50-1.95 | 273 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 3.00-3.45 | 97 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 4.50-4.95 | 133 | NIL | NIL | NA |
| | 2108/XRL/EDHS02 | 6.00-6.45 | 123 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 0.50-1.40 | 62 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 1.50-2.40 | 77 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 3.00-3.90 | 158 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 4.95-5.85 | 264 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q01 | 5.85-6.30 | 240 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 0.50-1.40 | 65 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 1.50-2.40 | 67 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 3.00-3.90 | 131 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 4.95-5.85 | 180 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q02 | 5.85-6.20 | 141 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 0.50-1.40 | 42 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 1.50-2.40 | 66 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 3.00-3.90 | 142 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 4.95-5.40 | 166 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q03 | 6.00-6.90 | 72 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 0.50-1.40 | 36 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 1.50-2.40 | 67 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 3.00-3.90 | 125 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 4.95-5.85 | 138 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 5.85-6.75 | 59 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q04 | 6.75-7.20 | 76 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 0.50-1.40 | 95 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 1.50-2.40 | 120 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 3.00-3.90 | 155 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 489 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 5.85-6.75 | 203 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 287 | NIL | NIL | NA |
| | 2108/XRL/EDH28 | 0.50 | 124 | NIL | NIL | NA |
| | 2108/XRL/D329 | 0.50-0.95 | 149 | NIL | NIL | NA |
| | 2108/XRL/D329 | 1.50-1.85 | 158 | NIL | NIL | NA |
| | 2108/XRL/D329 | 3.00-3.33 | 1220 | NIL | NIL | NA |
| | 2108/XRL/M01 | 0.50-1.40 | 67 | NIL | NIL | NA |
| | 2108/XRL/M01 | 1.50-2.40 | 76 | NIL | NIL | NA |
| | 2108/XRL/M01 | 3.00-3.90 | 227 | NIL | NIL | NA |
| | 2108/XRL/M01 | 4.50-5.40 | 106 | NIL | NIL | NA |
| | 2108/XRL/M01 | 6.00-6.90 | 69 | NIL | NIL | NA |
| | 2108/XRL/M02 | 0.50-1.40 | 72 | NIL | NIL | NA |
| | 2108/XRL/M02 | 1.50-2.40 | 75 | NIL | NIL | NA |
| | 2108/XRL/M02 | 3.00-3.90 | 196 | NIL | NIL | NA |
| | 2108/XRL/M02 | 4.50-5.40 | 168 | NIL | NIL | NA |
| | 2108/XRL/M02 | 6.00-6.90 | 212 | NIL | NIL | NA |
| | 2108/XRL/M03 | 1.00-1.90 | 84 | NIL | NIL | NA |
| | 2108/XRL/M03 | 2.00-2.90 | 76 | NIL | NIL | NA |
| | 2108/XRL/M03 | 3.00-3.90 | 108 | NIL | NIL | NA |
| | 2108/XRL/M03 | 4.50-5.40 | 18 | NIL | NIL | NA |
| | 2108/XRL/M03 | 6.00-6.90 | 84 | NIL | NIL | NA |
| | 2108/XRL/M04 | 0.50-1.40 | 60 | NIL | NIL | NA |
| | 2108/XRL/M04 | 1.50-2.40 | 61 | NIL | NIL | NA |
| | 2108/XRL/M04 | 3.00-3.90 | 50 | NIL | NIL | NA |
| | 2108/XRL/M04 | 4.50-5.40 | 17 | NIL | NIL | NA |
| | 2108/XRL/M04 | 6.00-6.90 | 117 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 0.50-0.95 | 58 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 1.50-1.95 | 144 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 3.00-3.45 | 108 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 4.50-4.95 | 233 | NIL | NIL | NA |
| | 2108/XRL/EDH40 | 6.00-6.45 | 22 | NIL | NIL | NA |
| | 2108/XRL/A4a | 48.35-48.72 | 381 | NIL | NIL | NA |
| | 2108/XRL/A4b | 36.70-37.15 | 641 | NIL | NIL | NA |
| **Petroleum Carbon Ranges** | | | | | | |
| C6 - C8 | 2108/XRL/EDH30 | 3.00-3.45 | 9 | NIL | NIL | NA |
| C9 - C16 | 2108/XRL/EDH30 | 3.00-3.45 | 700 | NIL | NIL | NA |
| C17 - C35 | 2108/XRL/EDH-Q04 | 1.50-2.40 | 2630 | NIL | NIL | NA |
| | 2108/XRL/EDH-Q05E | 4.95-5.85 | 2630 | NIL | NIL | NA |
| | 2108/XRL/EDH27 | 0.50 | 1950 | NIL | NIL | NA |
| **PCBs** | | | | | | |
| PCBs | 2108/XRL/EDH28 | 0.50 | 0.2 | NIL | NIL | NA |
| | 2108/XRL/D329 | 0.50-0.95 | 0.1 | NIL | NIL | NA |
| **Other Inorganic Compound** | | | | | | |
| Cyanide, free | 2108/XRL/EDH28 | 0.50 | 1 | NIL | NIL | NA |

Note:
NA= Not Applicable
ND= Not Dectectable
NIL= Maximum concentration detected is below repective RBRG or solubility limit
* = Confirmatory tests would be carried out to further confirm size of affected area

Standard Form 3.5 – Groundwater Sample Concentrations and Exceedances of RBRGs and Csat

| Chemical | List Samples | | Concentration (µg/L) | Check if RBRG Exceeded | Check if Csat Exceeded | Approximate Size of Affected Area ($m^2$) |
|---|---|---|---|---|---|---|
| | Sample Number | Sample Depth (m, bgs) | | | | |
| **Volatile Organic Chemicals** | | | | | | |
| Acetone | NA | NA | ND | NA | NA | NA |
| Benzene | NA | NA | ND | NA | NA | NA |
| Bromodichloromethane | NA | NA | ND | NA | NA | NA |
| 2-Butanone | NA | NA | ND | NA | NA | NA |
| Chloroform | 2108/XRL/EDH31 | 43.87 | 8 | NIL | NIL | NA |
| Chloroform | 2108/XRL/EDH34 | 6.45 | 5 | NIL | NIL | NA |
| Chloroform | 2108/XRL/EDH36 | 6.45 | 6 | NIL | NIL | NA |
| Ethylbenzene | NA | NA | ND | NA | NA | NA |
| Methyl tert-Butyl Ether | NA | NA | ND | NA | NA | NA |
| Methylene Chloride | NA | NA | ND | NA | NA | NA |
| Styrene | NA | NA | ND | NA | NA | NA |
| Tetrachloroethene | NA | NA | ND | NA | NA | NA |
| Toluene | NA | NA | ND | NA | NA | NA |
| Trichloroethene | NA | NA | ND | NA | NA | NA |
| Xylenes (Total) | NA | NA | ND | NA | NA | NA |
| **Semi-Volatile Organic Chemicals** | | | | | | |
| Acenaphthene | NA | NA | ND | NA | NA | NA |
| Acenaphthylene | NA | NA | ND | NA | NA | NA |
| Anthracene | NA | NA | ND | NA | NA | NA |
| Benzo(b) & Benzo(k) fluoranthene | NA | NA | ND | NA | NA | NA |
| Chrysene | NA | NA | ND | NA | NA | NA |
| Fluoranthene | NA | NA | ND | NA | NA | NA |
| Fluorene | NA | NA | ND | NA | NA | NA |
| Hexachlorobenzene | NA | NA | ND | NA | NA | NA |
| Naphthalene | NA | NA | ND | NA | NA | NA |
| Phenanthrene | NA | NA | ND | NA | NA | NA |
| Pyrene | NA | NA | ND | NA | NA | NA |
| **Metals** | | | | | | |
| Mercury | NA | NA | ND | NA | NA | NA |
| **Petroleum Carbon Ranges** | | | | | | |
| C6 - C8 | NA | NA | ND | NA | NA | |
| C9 - C16 | NA | NA | ND | NA | NA | NA |
| C17 - C35 | 2108/XRL/EDH35 | 42.03 | 1100 | NIL | NIL | NA |
| C17 - C36 | 2108/XRL/EDHS01 | 6.45 | 600 | NIL | NIL | NA |
| **PCBs** | | | | | | |
| PCBs | NA | NA | ND | NA | NA | NA |
| **Other Inorganic Compound** | | | | | | |
| Cyanide, free | NA | NA | ND | NA | NA | NA |

Note:
NIL= Maximum concentration detected is below repective RBRG or solubility limit
NA= Not Applicable
ND= Not Dectectable

# Laboratory Report

**Site D**

**(2108/XRL/EDH40)**

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 15 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0818774 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 24-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 10-NOV-2008 |
| C-O-C number | : H004117 | | | No. of samples received | : 6 |
| Site | : ---- | | | No. of samples analysed | : 6 |

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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** | **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: 31-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0818774**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | LOR | Unit | Client sample ID | 2108/XRL/EDH40 (0.5M-0.95M) | 2108/XRL/EDH40 (1.5M-1.95M) | 2108/XRL/EDH40 (3.0M-3.45M) | 2108/XRL/EDH40 (4.5M-4.95M) | 2108/XRL/EDH40 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 24-OCT-2008 09:05 | 24-OCT-2008 09:50 | 24-OCT-2008 10:30 | 24-OCT-2008 11:10 | 24-OCT-2008 11:55 |
| | | | | | HK0818774-001 | HK0818774-002 | HK0818774-003 | HK0818774-004 | HK0818774-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | | **19.7** | **22.1** | **30.5** | **14.7** | **15.2** |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EG: Metals and Major Cations** | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | | <0.2 | <0.2 | **0.4** | <0.2 | <0.2 |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | | **17** | **17** | **12** | **23** | **13** |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | | **53** | **64** | **59** | **38** | **33** |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | | **8** | **18** | **11** | **3** | **2** |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | | **58** | **144** | **108** | **233** | **22** |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | | **16** | **25** | **18** | **8** | **6** |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | | <200 | <200 | <200 | <200 | <200 |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | | <500 | <500 | <500 | <500 | <500 |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH40 (0.5M-0.95M) | 2108/XRL/EDH40 (1.5M-1.95M) | 2108/XRL/EDH40 (3.0M-3.45M) | 2108/XRL/EDH40 (4.5M-4.95M) | 2108/XRL/EDH40 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 24-OCT-2008 09:05 | 24-OCT-2008 09:50 | 24-OCT-2008 10:30 | 24-OCT-2008 11:10 | 24-OCT-2008 11:55 |
| Compound | CAS Number | LOR | Unit | | HK0818774-001 | HK0818774-002 | HK0818774-003 | HK0818774-004 | HK0818774-005 |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.9** | **93.4** | **95.4** | **95.3** | **97.9** |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | **101** | **100** | **102** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.7** | **99.4** | **101** | **99.7** | **98.9** |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.9** | **93.4** | **95.4** | **95.3** | **97.9** |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | **101** | **100** | **102** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.7** | **99.4** | **101** | **99.7** | **98.9** |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **71.4** | **66.1** | **53.8** | **71.2** | **58.2** |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **85.4** | **67.7** | **59.2** | **82.2** | **66.8** |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **64.9** | **56.4** | **49.5** | **53.0** | **49.5** |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **75.5** | **68.0** | **53.6** | **74.4** | **59.4** |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **51.4** | **46.5** | **44.0** | **49.9** | **47.1** |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **56.8** | **53.8** | **50.0** | **59.0** | **51.4** |

| Sub-Matrix: **SEDIMENT** | | | *Client sample ID* | **2108/XRL/EDH40 (0.5M-0.95M)** | **2108/XRL/EDH40 (1.5M-1.95M)** | **2108/XRL/EDH40 (3.0M-3.45M)** | **2108/XRL/EDH40 (4.5M-4.95M)** | **2108/XRL/EDH40 (6.0M-6.45M)** |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sampling date / time* | 24-OCT-2008 09:05 | 24-OCT-2008 09:50 | 24-OCT-2008 10:30 | 24-OCT-2008 11:10 | 24-OCT-2008 11:55 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0818774-001** | **HK0818774-002** | **HK0818774-003** | **HK0818774-004** | **HK0818774-005** |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH40 (WATER SAMPLE) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 24-OCT-2008 14:30 | | | | |
| Compound | CAS Number | LOR | Unit | | HK0818774-006 | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | | <0.05 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | | <500 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | | <500 | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | | <20 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | | <5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | | <2 | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | | <2 | | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | | <2 | | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | | <2 | | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | | <2 | | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | | <2 | | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | | <2 | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | | <2 | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | | <2 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | | <4 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |

| Sub-Matrix: **WATER** | | | *Client sample ID* | **2108/XRL/EDH40 (WATER SAMPLE)** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sampling date / time* | 24-OCT-2008 14:30 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0818774-006** | | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | <4 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **104** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **99.1** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **108** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **104** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **99.1** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **108** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **40.2** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **32.0** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **22.5** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | **43.8** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | **55.9** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | **40.3** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 800160)** | | | | | | | | |
| HK0818773-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 19.0 | 21.7 | 13.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | |
| HK0818773-003 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 808057)** | | | | | | | | |
| HK0818774-001 | 2108/XRL/EDH40 (0.5M-0.95M) | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 7 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 52 | 53 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 74 | 80 | 8.8 |
| HK0818774-003 | 2108/XRL/EDH40 (3.0M-3.45M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.4 | 0.3 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 13 | 9.3 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | 56 | 4.4 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 11 | 10 | 13.4 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 108 | 129 | 17.1 |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | |
| HK0818773-003 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | |
| HK0818773-003 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799877)** | | | | | | | | |
| HK0818774-001 | 2108/XRL/EDH40 (0.5M-0.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074B: Oxygenated Compounds (QC Lot: 795166) - Continued** | | | | | | | | |
| HK0817886-001 | Anonymous | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | |
| HK0818773-004 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | |
| HK0818139-004 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | 8 | 9 | 20.7 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .2 mg/kg<br>---- | 99.1<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 808057)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1<br>---- | ----<br>9.83 mg/kg | ----<br>100 | ----<br>---- | ----<br>85 | ----<br>115 | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 88.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 94.3 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 92.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 805389) - Continued** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 111 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799877)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 68.1 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 74.7 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 115 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.0 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.8 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.7 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.0 | ---- | 60 | 104 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172) - Continued** | | | | | | | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.5 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 88.6 | ---- | 68 | 109 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 2 µg/L | 85.0 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 71.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795224)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 67.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 96.3 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 70.3 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 73.8 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 88.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 98.1 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 100 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 92.2 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 43.4 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 96.0 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 93.2 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 90.9 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 98.4 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 799892)** | | | | | | | | | | | |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 799892) - Continued** | | | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 85.3 | ---- | 42 | 113 | ---- | ---- |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 88.9 | ---- | 42 | 120 | ---- | ---- |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 77.1 | ---- | 44 | 115 | ---- | ---- |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 82.2 | ---- | 47 | 116 | ---- | ---- |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 83.2 | ---- | 51 | 112 | ---- | ---- |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 81.0 | ---- | 51 | 113 | ---- | ---- |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 86.9 | ---- | 63 | 112 | ---- | ---- |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 86.3 | ---- | 64 | 113 | ---- | ---- |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 83.8 | ---- | 62 | 116 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 84.6 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 799892)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 76.1 | ---- | 65 | 113 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | |
| HK0818547-002 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 90.8 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 90.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | |
| HK0818774-001 | 2108/XRL/EDH40 (0.5M-0.95M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | |
| HK0818773-003 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 76.6 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799877)** | | | | | | | | | | |
| HK0818774-002 | 2108/XRL/EDH40 (1.5M-1.95M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 64.4 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 53.8 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

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

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | |
| HK0818773-001 | Anonymous | **EG036: Mercury** | 7439-97-6 | 2 µg/L | 80.0 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |

**Site F**

**(2108/XRL/EDH29 to 2108/XRL/EDH32)**

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/631<br>**FILE REF** :<br>**SIGNED** :<br>**DATE** : 15 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole no. 2108/XRL/EDH29 | N | GCE/NEX/2108/2008/S631 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.
c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 7 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817256 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 09-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 14-NOV-2008 |
| C-O-C number | : H004106 | | | No. of samples received | : 5 |
| Site | : ---- | | | No. of samples analysed | : 5 |

### 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: 24-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817256**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH029 (0.5M-0.95M) | 2108/XRL/EDH029 (1.50M-1.95M) | 2108/XRL/EDH029 (3.00M-3.45M) | 2108/XRL/EDH029 (4.50M-4.95M) | 2108/XRL/EDH029 (6.00M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 09-OCT-2008 11:15 | 09-OCT-2008 13:25 | 09-OCT-2008 14:45 | 09-OCT-2008 15:45 | 09-OCT-2008 16:25 |
| Compound | CAS Number | LOR | Unit | | HK0817256-001 | HK0817256-002 | HK0817256-003 | HK0817256-004 | HK0817256-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | | 14.0 | 18.0 | 23.5 | 20.9 | 29.9 |
| **EG: Metals and Major Cations** | | | | | | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | | 11 | 20 | 11 | 22 | 7 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | | 57 | 56 | 84 | 43 | 123 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | | 18 | 14 | 6 | 4 | 6 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 83.8 | 82.9 | 85.7 | 86.1 | 97.0 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.4 | 96.5 | 96.2 | 95.9 | 98.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH029 (0.5M-0.95M) | 2108/XRL/EDH029 (1.50M-1.95M) | 2108/XRL/EDH029 (3.00M-3.45M) | 2108/XRL/EDH029 (4.50M-4.95M) | 2108/XRL/EDH029 (6.00M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 09-OCT-2008 11:15 | 09-OCT-2008 13:25 | 09-OCT-2008 14:45 | 09-OCT-2008 15:45 | 09-OCT-2008 16:25 |
| Compound | CAS Number | LOR | Unit | | HK0817256-001 | HK0817256-002 | HK0817256-003 | HK0817256-004 | HK0817256-005 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 106 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 83.8 | 82.9 | 85.7 | 86.1 | 97.0 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.4 | 96.5 | 96.2 | 95.9 | 98.0 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 106 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 68.2 | 59.3 | 71.7 | 63.5 | 62.5 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 64.8 | 53.6 | 68.0 | 58.9 | 55.8 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 59.5 | 61.7 | 68.8 | 60.7 | 58.8 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 64.2 | 58.2 | 70.8 | 62.1 | 60.8 |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 66.3 | 56.8 | 68.8 | 60.8 | 60.4 |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 86.9 | 78.4 | 84.2 | 77.4 | 76.4 |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 787399)** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 14.0 | 11.7 | 17.8 |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | |
| HK0817256-002 | 2108/XRL/EDH029 (1.50M-1.95M) | EG020: Copper | 7440-50-8 | 1 | mg/kg | 20 | 19 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 58 | 3.3 |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | |
| HK0817256-002 | 2108/XRL/EDH029 (1.50M-1.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787431)** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787431) - Continued** | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1 | mg/kg | <1 | <1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 85.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 97.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 96.2 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 77.9 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.1 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 93.4 | ---- | 69 | 142 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 72 | 139 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 96.8 | ---- | 57 | 98 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 87.2 | ---- | 63 | 99 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 98.5 | ---- | 62 | 102 | ---- | ---- |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 97.5 | ---- | 62 | 109 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | # 100 | ---- | 66 | 100 | ---- | ---- |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 99.3 | ---- | 61 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 98.2 | ---- | 73 | 105 | ---- | ---- |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 99.7 | ---- | 73 | 105 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 91.0 | ---- | 45 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 87.1 | ---- | 65 | 112 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | ---- <1 | 0.50 mg/kg --- | 104 ---- | ---- ---- | 71 ---- | 107 ---- | ---- ---- | ---- ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787431) - Continued** | | | | | | | | | | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 94.3 | ---- | 51 | 109 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 93.8 | ---- | 46 | 119 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 96.0 | ---- | 62 | 113 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | 0.25 mg/kg | 100 | ---- | 58 | 117 | ---- | ---- |

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

| Matrix: SOIL | | | | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Concentration | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | EG020: Copper | 7440-50-8 | 5 mg/kg | 80.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | |
| HK0817256-001 | 2108/XRL/EDH029 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | |
| HK0817256-002 | 2108/XRL/EDH029 (1.50M-1.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 82.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | |
| HK0817256-002 | 2108/XRL/EDH029 (1.50M-1.95M) | C9 - C16 Fraction | ---- | 31 mg/kg | 73.7 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 71.6 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| 2-Fluorophenol | 367-12-4 | 25 | 121 |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | |
| 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 | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem (HK) Pty Ltd** | Page | : **1 of 5** |
| Contact | : **MR TOM LO** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0817675** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **tom@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **09-OCT-2008** |
| Order number | : **----** | | | Issue Date | : **29-OCT-2008** |
| C-O-C number | : **H004109** | | | 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 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: 23-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817675**

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

**Water sample(s) analysed and reported on an as received 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** | **Senior Chemist** | **Organics** |

## Analytical Results

Sub-Matrix: **WATER**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH29 WATER SAMPLE | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 09-OCT-2008 16:00 | | | | |
| | | | | HK0817675-001 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **93.7** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **97.0** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **112** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **93.7** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **97.0** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **112** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **47.4** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **40.6** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **60.0** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | **44.4** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | **55.2** | | | | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **2108/XRL/EDH29 WATER SAMPLE** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 09-OCT-2008 16:00 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0817675-001** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **80.7** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | |
| HK0817140-001 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | 2108/XRL/EDH29 WATER SAMPLE | **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 117 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 783970)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 88.7 | ---- | 25 | 90 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 75.8 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | ---- | 54 | 132 | ---- | ---- |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | ---- | 59 | 128 | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 68 | 125 | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | ---- | 75 | 122 | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | ---- | 72 | 125 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | ---- | 42 | 113 | ---- | ---- |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | ---- | 42 | 120 | ---- | ---- |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | ---- | 44 | 115 | ---- | ---- |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 47 | 116 | ---- | ---- |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | ---- | 51 | 112 | ---- | ---- |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | ---- | 51 | 113 | ---- | ---- |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | ---- | 63 | 112 | ---- | ---- |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | ---- | 64 | 113 | ---- | ---- |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | ---- | 62 | 116 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | ---- | 65 | 114 | ---- | ---- |

## *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: **WATER**

| | | *Recovery Limits (%)* | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

MTR

Project Management - XRL Department

4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT

Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD. 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER CONTRACT NEX/2108 MTR CORPORATION HONG KONG | **CSF No.** : NEX2108/SUB/646 |
|---|---|---|
| | | **FILE REF** : |
| | | **SIGNED** : p.p. John Fung |
| | | **DATE** : 20 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH30 and 2108/XRL/EDH34 | N | GCE/NEX/2108/2008/S646 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk

SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk

GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

PRELIMINARY REPORT FOR REFERENCE ONLY

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 14 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0819723 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRE | Quote number | : ---- | Date Samples Received | : 13-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 20-NOV-2008 14:21 |
| C-O-C number | : H004111 | | | No. of samples received | : 9 |
| Site | : ---- | | | No. of samples analysed | : 9 |

### 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: 13-NOV-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0819723**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## *Analytical Results*

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| | | | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 11.3 | 13.6 | 23.5 | 16.8 | 16.4 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | ---- | ---- | ---- | <1 | <1 |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | ---- | ---- | ---- | 0.4 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 23 | 38 | 13 | 50 | 10 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 91 | 50 | 75 | 36 | 40 |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | ---- | ---- | ---- | 0.09 | 0.14 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | ---- | ---- | ---- | 6 | 8 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | ---- | ---- | ---- | 209 | 84 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 12 | 14 | 5 | 11 | 17 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 700 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 9 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | ---- | ---- | ---- | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | ---- | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | ---- | ---- | ---- | ---- | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | ---- | ---- | ---- | ---- | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | ---- | ---- | ---- | ---- | <0.1 | <0.1 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.6 | 111 | 97.6 | 97.5 | 89.8 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 102 | 100 | 99.4 | 98.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 107 | 108 | 105 | 103 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.6 | 111 | 97.6 | 97.5 | 89.8 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 102 | 100 | 99.4 | 98.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 107 | 108 | 105 | 103 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 69.5 | 71.2 | 58.2 | 54.6 | 71.4 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 70.0 | 71.4 | 66.6 | 54.6 | 79.1 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 74.1 | 79.1 | 86.2 | 69.9 | 73.6 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **74.5** | **77.8** | **62.7** | **58.6** | **81.6** |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **74.1** | **73.1** | **78.6** | **58.8** | **86.9** |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **82.9** | **82.3** | **92.6** | **63.1** | **95.1** |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | ---- | ---- | ---- | **53.5** | **81.8** |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | ---- | ---- | ---- | **55.4** | **91.5** |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | --- | 0.1 | % | | 26.4 | 25.2 | 15.8 | 21.4 | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | | ---- | --- | <1 | <1 | |
| **EG: Metals and Major Cations** | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | | --- | --- | <0.2 | <0.2 | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | | 19 | 4 | 12 | 11 | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | | 509 | 14 | 54 | 35 | |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | | --- | --- | 0.05 | <0.05 | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | | --- | --- | 4 | 4 | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | | --- | --- | 262 | 168 | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | | 3 | 9 | 10 | 4 | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | | <200 | <200 | <200 | <200 | |
| C17 - C35 Fraction | --- | 500 | mg/kg | | <500 | <500 | <500 | <500 | |
| C6 - C8 Fraction | --- | 5 | mg/kg | | <5 | <5 | <5 | <5 | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Toluene | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Styrene | 100-42-5 | 0.5 | mg/kg | | ---- | ---- | <0.5 | <0.5 | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | | ---- | --- | <5 | <5 | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | | --- | --- | <5 | <5 | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | | --- | --- | <5 | <5 | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | --- | --- | <5.0 | <5.0 | |
| **EP-075A: Phenols** | | | | | | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 |
| **EP-075A: Phenols - Continued** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | ---- | ---- | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | ---- | ---- | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | ---- | ---- | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | ---- | ---- | <0.1 | <0.1 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 91.4 | 87.9 | 95.3 | 94.2 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 99.9 | 98.6 | 101 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 103 | 102 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 91.4 | 87.9 | 95.3 | 94.2 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 99.9 | 98.6 | 101 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 103 | 102 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 48.2 | 70.0 | 77.2 | 46.4 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 67.3 | 74.5 | 74.5 | 63.2 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 27.8 | 72.4 | 72.9 | 35.2 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | 64.6 | 83.5 | 79.4 | 75.5 | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | 99.4 | 90.1 | 88.4 | 85.2 | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | 98.5 | 99.0 | 97.4 | 94.6 | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | ---- | ---- | 98.5 | 78.3 | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | ---- | ---- | 106 | 82.7 | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 807971)** | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 13.6 | 12.6 | 7.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 811951)** | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | |
| HK0819526-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 52 | 57 | 9.5 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0819723-007 | 2108/XRL/EDH30 (6.0M-6.45M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 14 | 15 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 174 | 156 | 10.7 |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | |
| HK0819723-005 | 2108/XRL/EDH34 (1.5M-1.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | |
| HK0817256-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121) - Continued** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399)** | | | | | | | | |
| HK0819151-001 | Anonymous | Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127) - Continued** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Bis(2-ethylhexyl)phthalate | 117-81-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 808128)** | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 811951)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .19062 mg/kg<br>---- | 89.9<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.1 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 98.0 | ---- | 85 | 115 | ---- | ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 809209) - Continued** | | | | | | | | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 96.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 111 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 130 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | ---- | # Not Authorised | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | ---- | # Not Authorised | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 99.1 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 89.1 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 808121)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 52.7 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 808121)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.9 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 808121)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 808127)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.3 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.9 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.2 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.9 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.6 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.6 | ---- | 69 | 106 | ---- | ---- |

Matrix: SOIL

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399) - Continued** | | | | | | | | | | | |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.4 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.7 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.5 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 68 | 112 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.9 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.7 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.1 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.7 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.4 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.6 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.0 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 82.0 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.9 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.6 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 808127)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.4 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 808128)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 105 | ---- | 59 | 152 | ---- | ---- |

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

Matrix: SOIL

| | | | | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Concentration | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | | | |
| HK0819526-001 | Anonymous | | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 809209) - Continued** | | | | | | | | | | |
| HK0819526-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 98.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 100 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | 86.0 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | |
| HK0817256-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 106 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | C9 - C16 Fraction | ---- | ---- | # Not Authorised | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | ---- | # Not Authorised | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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** | | | |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| *Compound* | *CAS Number* | *Low* | *High* |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 23 | 120 |
| 2-Fluorobiphenyl | 321-60-8 | 30 | 115 |
| 4-Terphenyl-d14 | 1718-51-0 | 20 | 137 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 13 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817687 |
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| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 14-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 05-NOV-2008 |
| C-O-C number | : H004112 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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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** | **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: 30-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817687**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

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

**Water sample(s) analysed and reported on an as received basis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH37 (3.90M-4.80M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 14-OCT-2008 09:35 | | | | |
| | | | | HK0817687-002 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 35.7 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 137 | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Chromium | 7440-47-3 | 1 | mg/kg | 17 | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | | | | |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | | | | |
| EG020: Silver | 7440-22-4 | 0.1 | mg/kg | 0.2 | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | | | | |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 50 | µg/kg | <50 | | | | |
| Acenaphthylene | 208-96-8 | 50 | µg/kg | <50 | | | | |
| Acenaphthene | 83-32-9 | 50 | µg/kg | <50 | | | | |
| Fluorene | 86-73-7 | 50 | µg/kg | <50 | | | | |
| Phenanthrene | 85-01-8 | 50 | µg/kg | <50 | | | | |
| Anthracene | 120-12-7 | 50 | µg/kg | <50 | | | | |
| Fluoranthene | 206-44-0 | 150 | µg/kg | <150 | | | | |
| Pyrene | 129-00-0 | 150 | µg/kg | <150 | | | | |
| Benz(a)anthracene | 56-55-3 | 150 | µg/kg | <150 | | | | |
| Chrysene | 218-01-9 | 150 | µg/kg | <150 | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 300 | µg/kg | <300 | | | | |
| Benzo(a)pyrene | 50-32-8 | 150 | µg/kg | <150 | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 150 | µg/kg | <150 | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 150 | µg/kg | <150 | | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 150 | µg/kg | <150 | | | | |
| Low M.W. PAHs | ---- | 550 | µg/kg | <550 | | | | |
| High M.W. PAHs | ---- | 1700 | µg/kg | <1700 | | | | |
| **EP-065: PCB Single Congeners** | | | | | | | | |
| PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | | | | |
| PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | | | | |
| PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | | | | |
| PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | | | | |
| PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH37 (3.90M-4.80M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0817687-002 | | | |
| **EP-065: PCB Single Congeners - Continued** | | | | | | | | |
| PCB 66 | 32598-10-0 | 3 | µg/kg | | <3 | | | |
| PCB 101 | 37680-73-2 | 3 | µg/kg | | <3 | | | |
| PCB 77 | 32598-13-3 | 3 | µg/kg | | <3 | | | |
| PCB 149 | 38380-04-0 | 3 | µg/kg | | <3 | | | |
| PCB 118 | 31508-00-6 | 3 | µg/kg | | <3 | | | |
| PCB 153 | 35065-27-1 | 3 | µg/kg | | <3 | | | |
| PCB 105 | 32598-14-4 | 3 | µg/kg | | <3 | | | |
| PCB 138 | 35065-28-2 | 3 | µg/kg | | <3 | | | |
| PCB 126 | 57465-28-8 | 3 | µg/kg | | <3 | | | |
| PCB 187 | 52663-68-0 | 3 | µg/kg | | <3 | | | |
| PCB 128 | 38380-07-3 | 3 | µg/kg | | <3 | | | |
| PCB 156 | 38380-08-4 | 3 | µg/kg | | <3 | | | |
| PCB 180 | 35065-29-3 | 3 | µg/kg | | <3 | | | |
| PCB 169 | 60044-26-0 | 3 | µg/kg | | <3 | | | |
| PCB 170 | 35065-30-6 | 3 | µg/kg | | <3 | | | |
| PCB 195 | 52663-78-2 | 3 | µg/kg | | <3 | | | |
| PCB 206 | 40186-72-9 | 3 | µg/kg | | <3 | | | |
| **EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 57.8 | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 92.9 | | | |
| **EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | 99.2 | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH34 (WATER SAMPLE) | 2108/XRL/EDH30 (WATER SAMPLE) |
|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:50 | 14-OCT-2008 09:55 |
| Compound | CAS Number | LOR | Unit | | HK0817687-003 | HK0817687-004 |
| **EG: Metals and Major Cations - Filtered** | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | | <0.05 | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | |
| C9 - C16 Fraction | ---- | 500 | µg/L | | <500 | <500 |
| C17 - C35 Fraction | ---- | 500 | µg/L | | <500 | <500 |
| C6 - C8 Fraction | ---- | 20 | µg/L | | <20 | <20 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | | <5 | <5 |
| Toluene | 108-88-3 | 5 | µg/L | | <5 | <5 |
| Ethylbenzene | 100-41-4 | 5 | µg/L | | <5 | <5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 |
| Styrene | 100-42-5 | 5 | µg/L | | <5 | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | | <5 | <5 |
| **EP-074B: Oxygenated Compounds** | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | | <50 | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | | <50 | ---- |
| **EP-074E: Halogenated Aliphatics** | | | | | | |
| Methylene chloride | 75-09-2 | 50 | µg/L | | <50 | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | | <5 | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | | <5 | ---- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | | 5 | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | | <5 | ---- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | | <5 | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | | <2 | <2 |
| Acenaphthylene | 208-96-8 | 2 | µg/L | | <2 | <2 |
| Acenaphthene | 83-32-9 | 2 | µg/L | | <2 | <2 |
| Fluorene | 86-73-7 | 2 | µg/L | | <2 | <2 |
| Phenanthrene | 85-01-8 | 2 | µg/L | | <2 | <2 |
| Anthracene | 120-12-7 | 2 | µg/L | | <2 | <2 |
| Fluoranthene | 206-44-0 | 2 | µg/L | | <2 | <2 |
| Pyrene | 129-00-0 | 2 | µg/L | | <2 | <2 |
| Chrysene | 218-01-9 | 2 | µg/L | | <2 | <2 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | | <4 | <4 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH34 (WATER SAMPLE) | 2108/XRL/EDH30 (WATER SAMPLE) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:50 | 14-OCT-2008 09:55 | | |
| Compound | CAS Number | LOR | Unit | | HK0817687-003 | HK0817687-004 | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | | <4 | --- | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.10 | µg/L | | <0.10 | --- | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 94.4 | 98.0 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 102 | 101 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 112 | 110 | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 94.4 | 98.0 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 102 | 101 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 112 | 110 | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 61.0 | 39.6 | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 59.0 | 30.4 | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 49.2 | 71.8 | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 49.6 | 52.5 | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 52.4 | 55.5 | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 80.4 | 97.2 | | |
| **EP-066S: PCB Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | 99.9 | --- | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 790379)** | | | | | | | | |
| HK0817681-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 17.0 | 16.2 | 5.3 |
| HK0817703-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 13.6 | 12.6 | 8.1 |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Silver | 7440-22-4 | 0.1 | mg/kg | 0.2 | 0.2 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 137 | 118 | 14.6 |
| | | EG020: Chromium | 7440-47-3 | 1 | mg/kg | 17 | 14 | 16.1 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | 29 | 5.2 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | 77 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | 120 | 0.0 |
| HK0818139-002 | Anonymous | EG020: Silver | 7440-22-4 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 3 | 4 | 0.0 |
| | | EG020: Chromium | 7440-47-3 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 23 | 23 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 140 | 125 | 11.5 |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | Fluoranthene | 206-44-0 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Pyrene | 129-00-0 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Chrysene | 218-01-9 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | High M.W. PAHs | --- | 1700 | µg/kg | <1700 | <1700 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 300 | µg/kg | <300 | <300 | 0.0 |
| | | Naphthalene | 91-20-3 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Acenaphthene | 83-32-9 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Fluorene | 86-73-7 | 50 | µg/kg | <50 | <50 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757) - Continued** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | Phenanthrene | 85-01-8 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Anthracene | 120-12-7 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Low M.W. PAHs | --- | 550 | µg/kg | <550 | <550 | 0.0 |
| **EP-065: PCB Single Congeners (QC Lot: 789758)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 66 | 32598-10-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 101 | 37680-73-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 77 | 32598-13-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 149 | 38380-04-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 118 | 31508-00-6 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 153 | 35065-27-1 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 105 | 32598-14-4 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 138 | 35065-28-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 126 | 57465-28-8 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 187 | 52663-68-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 128 | 38380-07-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 156 | 38380-08-4 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 180 | 35065-29-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 169 | 60044-26-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 170 | 35065-30-6 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 195 | 52663-78-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 206 | 40186-72-9 | 3 | µg/kg | <3 | <3 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | |
| HK0817687-003 | 2108/XRL/EDH34 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | |
| HK0817140-001 | Anonymous | C6 - C8 Fraction | --- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | Benzene | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Toluene | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900) - Continued** | | | | | | | | |
| HK0817675-001 | Anonymous | Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Styrene | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Methylene chloride | 75-09-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Trichloroethene | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Chloroform | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | Spike Recovery (%): DCS | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | | | | |
| EG020: Arsenic | 7440-38-2 | 1 | mg/kg | <1 | 5 mg/kg | 94.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Chromium | 7440-47-3 | 1 | mg/kg | <1 | 5 mg/kg | 86.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Silver | 7440-22-4 | 0.1 | mg/kg | <0.1 | 5 mg/kg | 86.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 5 | µg/kg | ---- | 49.9 µg/kg | 71.1 | ---- | 37 | 127 | ---- | ---- |
| | | | | <10 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Acenaphthylene | 208-96-8 | 5 | µg/kg | <5 | 50.9 µg/kg | 69.5 | ---- | 26 | 119 | ---- | ---- |
| Acenaphthene | 83-32-9 | 5 | µg/kg | <5 | 50.4 µg/kg | 68.3 | ---- | 36 | 111 | ---- | ---- |
| Fluorene | 86-73-7 | 5 | µg/kg | <5 | 51.0 µg/kg | 57.2 | ---- | 40 | 113 | ---- | ---- |
| Phenanthrene | 85-01-8 | 5 | µg/kg | <5 | 51.2 µg/kg | 90.1 | ---- | 35 | 120 | ---- | ---- |
| Anthracene | 120-12-7 | 5 | µg/kg | <5 | 50.7 µg/kg | 83.5 | ---- | 24 | 118 | ---- | ---- |
| Fluoranthene | 206-44-0 | 5 | µg/kg | <5 | 51.0 µg/kg | 92.2 | ---- | 46 | 120 | ---- | ---- |
| Pyrene | 129-00-0 | 5 | µg/kg | <5 | 51.1 µg/kg | 101 | ---- | 42 | 126 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757) - Continued** | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 5 | µg/kg | <5 | 50.1 µg/kg | 60.8 | ---- | 35 | 140 | ---- | ---- |
| Chrysene | 218-01-9 | 5 | µg/kg | <5 | 50.8 µg/kg | 59.7 | ---- | 46 | 139 | ---- | ---- |
| Benzo(b) & | 205-99-2 207-08-9 | 5 | µg/kg | ---- | 101.9 µg/kg | 64.7 | ---- | 41 | 141 | ---- | ---- |
| Benzo(k)fluoranthene | | | | <10 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 5 | µg/kg | <5 | 50.7 µg/kg | 58.5 | ---- | 20 | 134 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 5 | µg/kg | <5 | 49.0 µg/kg | 70.9 | ---- | 32 | 159 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 5 | µg/kg | <5 | 50.2 µg/kg | 64.8 | ---- | 31 | 150 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 5 | µg/kg | <5 | 50.7 µg/kg | 65.9 | ---- | 40 | 148 | ---- | ---- |
| Low M.W. PAHs | ---- | 5 | µg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| High M.W. PAHs | ---- | 5 | µg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-065: PCB Single Congeners (QC Lot: 789758)** | | | | | | | | | | | |
| PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | 5 µg/kg | 106 | ---- | 51 | 119 | ---- | ---- |
| PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | 5 µg/kg | 107 | ---- | 19 | 134 | ---- | ---- |
| PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | 5 µg/kg | 81.7 | ---- | 52 | 107 | ---- | ---- |
| PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | 5 µg/kg | 114 | ---- | 32 | 119 | ---- | ---- |
| PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | 5 µg/kg | 92.5 | ---- | 29 | 118 | ---- | ---- |
| PCB 66 | 32598-10-0 | 3 | µg/kg | <3 | 5 µg/kg | 91.6 | ---- | 50 | 109 | ---- | ---- |
| PCB 101 | 37680-73-2 | 3 | µg/kg | <3 | 5 µg/kg | 86.0 | ---- | 35 | 150 | ---- | ---- |
| PCB 77 | 32598-13-3 | 3 | µg/kg | <3 | 5 µg/kg | 110 | ---- | 53 | 134 | ---- | ---- |
| PCB 149 | 38380-04-0 | 3 | µg/kg | <3 | 5 µg/kg | 72.4 | ---- | 23 | 148 | ---- | ---- |
| PCB 118 | 31508-00-6 | 3 | µg/kg | <3 | 5 µg/kg | 119 | ---- | 43 | 144 | ---- | ---- |
| PCB 153 | 35065-27-1 | 3 | µg/kg | <3 | 5 µg/kg | 120 | ---- | 41 | 144 | ---- | ---- |
| PCB 105 | 32598-14-4 | 3 | µg/kg | <3 | 5 µg/kg | 110 | ---- | 50 | 142 | ---- | ---- |
| PCB 138 | 35065-28-2 | 3 | µg/kg | <3 | 5 µg/kg | 117 | ---- | 43 | 153 | ---- | ---- |
| PCB 126 | 57465-28-8 | 3 | µg/kg | <3 | 5 µg/kg | 86.3 | ---- | 46 | 142 | ---- | ---- |
| PCB 187 | 52663-68-0 | 3 | µg/kg | <3 | 5 µg/kg | 113 | ---- | 42 | 142 | ---- | ---- |
| PCB 128 | 38380-07-3 | 3 | µg/kg | <3 | 5 µg/kg | 113 | ---- | 42 | 145 | ---- | ---- |
| PCB 156 | 38380-08-4 | 3 | µg/kg | <3 | 5 µg/kg | 107 | ---- | 44 | 134 | ---- | ---- |
| PCB 180 | 35065-29-3 | 3 | µg/kg | <3 | 5 µg/kg | 120 | ---- | 51 | 136 | ---- | ---- |
| PCB 169 | 60044-26-0 | 3 | µg/kg | <3 | 5 µg/kg | 93.3 | ---- | 46 | 136 | ---- | ---- |
| PCB 170 | 35065-30-6 | 3 | µg/kg | <3 | 5 µg/kg | 102 | ---- | 43 | 139 | ---- | ---- |
| PCB 195 | 52663-78-2 | 3 | µg/kg | <3 | 5 µg/kg | 101 | ---- | 47 | 136 | ---- | ---- |
| PCB 206 | 40186-72-9 | 3 | µg/kg | <3 | 5 µg/kg | 98.6 | ---- | 38 | 140 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | | | | |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567) - Continued** | | | | | | | | | | | |
| C6 - C8 Fraction | --- | 0.02 | mg/L | <0.02 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 0.15 mg/L | 117 | --- | 50 | 130 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 783970)** | | | | | | | | | | | |
| C9 - C16 Fraction | --- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 88.7 | --- | 25 | 90 | --- | --- |
| C17 - C35 Fraction | --- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 75.8 | --- | 29 | 116 | --- | --- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | --- | 54 | 132 | --- | --- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | --- | 59 | 128 | --- | --- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | --- | 68 | 125 | --- | --- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | --- | 75 | 122 | --- | --- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 108 | --- | 73 | 119 | --- | --- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | --- | 72 | 125 | --- | --- |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | --- | --- | --- | --- | --- | --- | --- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 46.0 | --- | 63 | 126 | --- | --- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | --- | --- | --- | --- | --- | --- | --- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 107 | --- | 67 | 125 | --- | --- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 110 | --- | 59 | 126 | --- | --- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 96.1 | --- | 68 | 123 | --- | --- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 104 | --- | 77 | 120 | --- | --- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | --- | --- | --- | --- | --- | --- | --- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | --- | 42 | 113 | --- | --- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | --- | 42 | 120 | --- | --- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | --- | 44 | 115 | --- | --- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | --- | 47 | 116 | --- | --- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | --- | 51 | 112 | --- | --- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | --- | 51 | 113 | --- | --- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | --- | 63 | 112 | --- | --- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | --- | 64 | 113 | --- | --- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | --- | 62 | 116 | --- | --- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | --- | 65 | 114 | --- | --- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 790431)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 92.5 | --- | 65 | 113 | --- | --- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 790432)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 91.4 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | |
| HK0817678-002 | Anonymous | EG036: Mercury | 7439-97-6 | 0.2 µg/L | 100 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 50 | 130 |
| 4-Terphenyl-d14 | 1718-51-0 | 50 | 130 |
| **EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate** | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

Sub-Matrix: WATER

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| 2-Fluorophenol | 367-12-4 | 21 | 100 |
| Phenol-d6 | 13127-88-3 | 20 | 94 |
| 2.4.6-Tribromophenol | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 35 | 114 |
| 2-Fluorobiphenyl | 321-60-8 | 43 | 116 |
| 4-Terphenyl-d14 | 1718-51-0 | 33 | 141 |

| Sub-Matrix: WATER | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-066S: PCB Surrogate | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/593<br>**FILE REF** :<br>**SIGNED** : P. P. John Fung<br>**DATE** : 06 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH31 and 2108/XRL/EDH36 | N | GCE/NEX/2108/2008/S593 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*
N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.
c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 10 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817886 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 15-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 06-NOV-2008 |
| C-O-C number | : H004113 | | | No. of samples received | : 7 |
| Site | : ---- | | | No. of samples analysed | : 5 |

## 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: 30-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817886**

**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.**

**Sample(s) as received, digested by in-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|
| Client sampling date / time | | | | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| | | | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 20.5 | 17.7 | 15.6 | 14.6 | 25.6 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | ---- | ---- | <1 | <1 | ---- |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 11 | 17 | 7 | 23 | 13 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 110 | 74 | 30 | 46 | 30 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 6 | 6 | 4 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 337 | 118 | 70 | 82 | 250 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 8 | 9 | 12 | 20 | 7 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| Compound | CAS Number | LOR | Unit | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | | --- | --- | <0.1 | <0.1 | --- |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 96.0 | 100 | 98.2 | 97.7 | 94.7 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 100 | 100 | 99.8 | 99.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 101 | 101 | 101 | 101 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 96.0 | 100 | 98.2 | 97.7 | 94.7 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 100 | 100 | 99.8 | 99.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 101 | 101 | 101 | 101 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 68.2 | 55.4 | 71.2 | 69.9 | 83.0 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 61.1 | 46.5 | 65.3 | 61.7 | 78.0 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 69.3 | 62.8 | 75.6 | 85.9 | 69.0 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| Compound | CAS Number | LOR | Unit | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 68.3 | 53.7 | 65.5 | 92.2 | 94.8 |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 69.6 | 62.2 | 62.0 | 57.0 | 94.2 |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 97.4 | 97.0 | 96.6 | 91.2 | 98.8 |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | ---- | ---- | 58.2 | 80.1 | ---- |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | ---- | ---- | 72.8 | 74.7 | ---- |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 793812)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 20.5 | 20.8 | 1.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | |
| HK0818139-003 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | |
| HK0817886-007 | 2108/XRL/EDH31 (6.0M-6.45M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | |
| HK0817687-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | 29 | 5.2 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | 77 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | 120 | 0.0 |
| HK0818139-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 23 | 23 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 140 | 125 | 11.5 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166) - Continued** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | |
| HK0817384-001 | Anonymous | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | .1906 mg/kg | 96.1 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 97.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165) - Continued** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 110 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 75.4 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.4 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 792478)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.0 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 100 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.6 | ---- | 72 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 792478)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 113 | ---- | 16 | 138 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 115 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 792478)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 74 | 128 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 792478)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.9 | ---- | 59 | 142 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 49 | 103 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 125 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | |
| HK0817681-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | |
| HK0817886-002 | 2108/XRL/EDH31 (1.5M-1.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 93.8 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | |
| HK0817886-002 | 2108/XRL/EDH31 (1.5M-1.95M) | C9 - C16 Fraction | ---- | 31 mg/kg | 62.4 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 61.3 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| | Recovery Limits (%) |
|---|---|

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/643<br>**FILE REF** :<br>**SIGNED** : p.p. John Fung<br>**DATE** : 19 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH31 and 2108/XRL/EDH36 | N | GCE/NEX/2108/2008/S643 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 15 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0818773 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 16-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 19-NOV-2008 |
| C-O-C number | : H004114 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 31-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0818773**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 19.0 | | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 2.4 | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 37 | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 194 | | | | |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 407 | | | | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 4 | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | | | | |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | | | | |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | | | | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | | |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | | | | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | | | | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | | | | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | | | | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | | | | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | | | | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | | | | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | | | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | <0.1 | | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 92.9 | | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 99.8 | | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 100 | | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 92.9 | | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 99.8 | | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 100 | | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | 56.8 | | | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | 61.1 | | | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | 48.7 | | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | 55.9 | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | 48.6 | | | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | 55.8 | | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | 74.1 | | | | | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | 64.6 | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH31 (WATER SAMPLE) | 2108/XRL/EDH36 (WATER SAMPLE) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 09:35 | 16-OCT-2008 13:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0818773-001 | HK0818773-004 | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | | <0.05 | <0.05 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| C9 - C16 Fraction | --- | 500 | µg/L | | <500 | <500 | | | |
| C17 - C35 Fraction | --- | 500 | µg/L | | <500 | <500 | | | |
| C6 - C8 Fraction | --- | 20 | µg/L | | <20 | <20 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | | <5 | <5 | | | |
| Toluene | 108-88-3 | 5 | µg/L | | <5 | <5 | | | |
| Ethylbenzene | 100-41-4 | 5 | µg/L | | <5 | <5 | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 | | | |
| Styrene | 100-42-5 | 5 | µg/L | | <5 | <5 | | | |
| ortho-Xylene | 95-47-6 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | | <50 | <50 | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | | <50 | <50 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| Methylene chloride | 75-09-2 | 50 | µg/L | | <50 | <50 | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | | <5 | <5 | | | |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | | 8 | 6 | | | |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | | <2 | <2 | | | |
| Acenaphthylene | 208-96-8 | 2 | µg/L | | <2 | <2 | | | |
| Acenaphthene | 83-32-9 | 2 | µg/L | | <2 | <2 | | | |
| Fluorene | 86-73-7 | 2 | µg/L | | <2 | <2 | | | |
| Phenanthrene | 85-01-8 | 2 | µg/L | | <2 | <2 | | | |
| Anthracene | 120-12-7 | 2 | µg/L | | <2 | <2 | | | |
| Fluoranthene | 206-44-0 | 2 | µg/L | | <2 | <2 | | | |
| Pyrene | 129-00-0 | 2 | µg/L | | <2 | <2 | | | |
| Chrysene | 218-01-9 | 2 | µg/L | | <2 | <2 | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | | <4 | <4 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH31 (WATER SAMPLE) | 2108/XRL/EDH36 (WATER SAMPLE) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 09:35 | 16-OCT-2008 13:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0818773-001 | HK0818773-004 | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | | <4 | <4 | | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.01 | µg/L | | --- | <0.01 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 103 | 105 | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 98.2 | 99.8 | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 107 | 113 | | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 103 | 105 | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 98.2 | 99.8 | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 107 | 113 | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 33.0 | 33.6 | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 37.1 | 23.7 | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 20.4 | 20.8 | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 43.6 | 38.2 | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 48.2 | 49.4 | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 42.5 | 39.4 | | | |
| **EP-066S: PCB Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | --- | 94.2 | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 800160)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 19.0 | 21.7 | 13.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 7 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 52 | 53 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 74 | 80 | 8.8 |
| HK0818774-003 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.4 | 0.3 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 13 | 9.3 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | 56 | 4.4 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 11 | 10 | 13.4 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 108 | 129 | 17.1 |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166) - Continued** | | | | | | | | |
| HK0817886-001 | Anonymous | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 799890)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685) - Continued** | | | | | | | | |
| HK0818773-004 | 2108/XRL/EDH36 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | |
| HK0818139-004 | Anonymous | C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | meta- & para-Xylene | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | Benzene | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Toluene | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Styrene | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Trichloroethene | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Chloroform | 67-66-3 | 5 | µg/L | 8 | 9 | 20.7 |
| | | Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1.0 | mg/kg | ----<br><1 | .2 mg/kg<br>---- | 99.1<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 88.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 804379) - Continued** | | | | | | | | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 94.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 92.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 111 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 100 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 77.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 115 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.0 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.8 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 69 | 106 | ---- | ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172) - Continued** | | | | | | | | | | | |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.7 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.0 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.5 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 88.6 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 799890)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 108 | ---- | 56 | 141 | ---- | ---- |

| Matrix: WATER | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 2 µg/L | 85.0 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 71.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795224)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 67.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 96.3 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 70.3 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 73.8 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 88.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 98.1 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 100 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 92.2 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 43.4 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 96.0 | ---- | 67 | 125 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216) - Continued** | | | | | | | | | | | |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 93.2 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 90.9 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 98.4 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 799892)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 85.3 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 88.9 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 77.1 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 82.2 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 83.2 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 81.0 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 86.9 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 86.3 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 83.8 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 84.6 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 799892)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 76.1 | ---- | 65 | 113 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 799893)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 105 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 90.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 90.0 | ---- | 75 | 125 | ---- | ---- |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 804379) - Continued** | | | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | |
| HK0818774-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 76.6 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C9 - C16 Fraction | ---- | 31 mg/kg | 101 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 80.0 | ---- | 50 | 130 | ---- | ---- |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 2 µg/L | 80.0 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-075T: Base/Neutral Extractable Surrogates - Continued | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 20 | 137 |
| EP-066S: PCB Surrogate | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

| Sub-Matrix: WATER | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-080S: TPH(Volatile)/BTEX Surrogate | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| EP-074S: VOC Surrogates | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| EP-075S: Acid Extractable Surrogates | | | |
| 2-Fluorophenol | 367-12-4 | 21 | 100 |
| Phenol-d6 | 13127-88-3 | 20 | 94 |
| 2.4.6-Tribromophenol | 118-79-6 | 20 | 123 |
| EP-075T: Base/Neutral Extractable Surrogates | | | |
| Nitrobenzene -d5 | 4165-60-0 | 35 | 114 |
| 2-Fluorobiphenyl | 321-60-8 | 43 | 116 |
| 4-Terphenyl-d14 | 1718-51-0 | 33 | 141 |
| EP-066S: PCB Surrogate | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/589<br>**FILE REF** :<br>**SIGNED** : P.P. John Fung<br>**DATE** : 06 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos. 2108/XRL/EDH32 and 2108/XRL/EDH33 | N | GCE/NEX/2108/2008/S589 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817384 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 2 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 10-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H004107 | | | No. of samples received | : 4 |
| Site | : ---- | | | 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 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: 29-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817384**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 |
| | | | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 12.5 | 17.5 | 18.1 | 10.7 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | ---- | ---- |
| **EG: Metals and Major Cations** | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.3 | <0.2 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 19 | 46 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | 139 | 32 | 61 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 10 | 4 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 169 | 98 | ---- | ---- |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 23 | 13 | ---- | ---- |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics** | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | ---- | ---- |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 | |
| Compound | CAS Number | LOR | Unit | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | ---- | ---- | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | ---- | ---- | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | ---- | ---- | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | ---- | ---- | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.4 | 87.9 | 89.3 | 91.0 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 98.0 | 96.2 | 96.3 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 103 | 103 | 102 | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.4 | 87.9 | 89.3 | 91.0 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 98.0 | 96.2 | 96.3 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 103 | 103 | 102 | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 26.8 | 41.4 | 44.6 | 40.9 | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 30.0 | 59.4 | 33.0 | 42.8 | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 88.4 | 38.9 | 71.4 | 65.7 | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 | |
| Compound | CAS Number | LOR | Unit | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 46.4 | 64.7 | 50.1 | 76.1 | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 54.9 | 52.3 | 47.0 | 60.5 | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 70.6 | 47.1 | 40.7 | 42.0 | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 105 | 81.6 | ---- | ---- | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 87.6 | 71.2 | ---- | ---- | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EA/ED: Physical and Aggregate Properties (QC Lot: 787399)** | | | | | | | | |
| HK0817256-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 14.0 | 11.7 | 17.8 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 791872)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | |
| HK0817256-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.10 | 0.10 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 20 | 19 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 58 | 3.3 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 105 | 109 | 3.6 |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | |
| HK0817384-002 | 2108/XRL/EDH33 (1.5M-1.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | |
| HK0817256-001 | Anonymous | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | |
| HK0817256-001 | Anonymous | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429) - Continued** | | | | | | | | |
| HK0817256-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | Not Authorised | # Not Authorised | # 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | DCS | Recovery Limits (%): Low | High | RPD (%): Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 791872)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | --- | 1.0 | mg/kg | --- | .2 mg/kg | 88.8 | --- | 85 | 115 | --- | --- |
| | | | | <1 | --- | --- | --- | --- | --- | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 793992) - Continued** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 85.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 97.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 103 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 87.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 85.3 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 96.2 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 77.9 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.1 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 93.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.2 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 83.2 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.8 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.6 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | | | | |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | Not Authorised | ---- | # Not Authorised | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | |
| HK0817256-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 95.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 80.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 83.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | |
| HK0817256-002 | Anonymous | C6 - C8 Fraction | ---- | 3 mg/kg | 82.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | |
| HK0817256-002 | Anonymous | C9 - C16 Fraction | ---- | 31 mg/kg | 73.7 | ---- | 50 | 130 | ---- | ---- |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432) - Continued | | | | | | | | | | |
| HK0817256-002 | Anonymous | C17 - C35 Fraction | --- | 75 mg/kg | 71.6 | --- | 50 | 130 | --- | --- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| EP-080S: TPH(Volatile)/BTEX Surrogate | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| EP-074S: VOC Surrogates | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| 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 |
| EP-066S: PCB Surrogate | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817699 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 11-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H004108 | | | No. of samples received | : 5 |
| Site | : ---- | | | No. of samples analysed | : 5 |

### 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: 29-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817699**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|
| Client sampling date / time | | | | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| | | | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | --- | 0.1 | % | 15.1 | 24.1 | 23.7 | 22.8 | 28.8 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | <1 | --- | <1 | --- | --- |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.3 | --- | <0.2 | --- | --- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 15 | --- | 9 | --- | --- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 155 | 107 | 86 | 44 | 28 |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | --- | --- | <0.20 | --- | --- |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | --- | --- | --- | --- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | --- | 2 | --- | --- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 241 | --- | 87 | --- | --- |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 11 | --- | 4 | --- | --- |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | --- | <1 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| Compound | CAS Number | LOR | Unit | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | <5.0 | ---- | <5.0 | ---- | ---- |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | ---- | <0.5 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | 0.7 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | ---- | <5.0 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | ---- | <0.2 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | ---- | <0.1 | ---- | ---- |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 81.4 | 82.1 | 83.3 | 81.8 | 84.9 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.3 | 96.8 | 97.1 | 98.3 | 97.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 104 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 81.4 | 82.1 | 83.3 | 81.8 | 84.9 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.3 | 96.8 | 97.1 | 98.3 | 97.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 104 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 70.5 | 76.0 | 51.0 | 53.3 | 53.6 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 79.6 | 78.2 | 60.9 | 70.6 | 59.6 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| Compound | CAS Number | LOR | Unit | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 60.4 | 57.5 | 35.6 | 34.8 | 53.5 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 72.2 | 78.6 | 56.6 | 62.6 | 51.2 |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 53.0 | 55.0 | 45.2 | 45.0 | 46.9 |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 61.8 | 63.0 | 45.4 | 49.8 | 56.2 |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 85.7 | ---- | 65.1 | ---- | ---- |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 84.8 | ---- | 65.0 | ---- | ---- |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 790379)** | | | | | | | | |
| HK0817681-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 17.0 | 16.2 | 5.3 |
| HK0817703-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 13.6 | 12.6 | 8.1 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | |
| HK0818139-003 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | |
| HK0817659-001 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.11 | 0.10 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 32 | 31 | 5.6 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 98 | 96 | 2.2 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 20 | 20 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 260 | 250 | 3.7 |
| HK0817699-002 | 2108/XRL/EDH32 (3.0M-3.45M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 13 | 16 | 18.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 107 | 106 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 196 | 190 | 3.2 |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | |
| HK0817886-007 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | |
| HK0817699-004 | 2108/XRL/EDH32 (4.5M-4.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | |
| HK0817681-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429) - Continued** | | | | | | | | |
| HK0817256-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| | | | 207-08-9 | | | | | |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | | | | |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522) - Continued** | | | | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | <1 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 1906 mg/kg | 96.1 | --- | 85 | 115 | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.7 | --- | 85 | 115 | --- | --- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.1 | --- | 85 | 115 | --- | --- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 98.1 | --- | 85 | 115 | --- | --- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | --- | 85 | 115 | --- | --- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | --- | 85 | 115 | --- | --- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.5 | --- | 85 | 115 | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 97.0 | --- | 85 | 115 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | <200 | 31 mg/kg | 111 | --- | 45 | 122 | --- | --- |
| C17 - C35 Fraction | --- | 500 | mg/kg | <500 | 75 mg/kg | 99.6 | --- | 50 | 111 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | | | | |
| C6 - C8 Fraction | --- | 5 | mg/kg | <5 | 3 mg/kg | 104 | --- | 63 | 135 | --- | --- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | --- | 57 | 144 | --- | --- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | --- | 66 | 128 | --- | --- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | --- | 76 | 134 | --- | --- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 93.4 | --- | 69 | 142 | --- | --- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.2 | --- | 69 | 126 | --- | --- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | --- | 72 | 139 | --- | --- |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 5.0 mg/kg | 83.2 | --- | 16 | 138 | --- | --- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | --- | 65 | 134 | --- | --- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | --- | 74 | 128 | --- | --- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.8 | --- | 59 | 145 | --- | --- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.6 | --- | 59 | 142 | --- | --- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | --- | 49 | 103 | --- | --- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | --- | 61 | 101 | --- | --- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | --- | 56 | 104 | --- | --- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 125 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | | | |
| HK0817659-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 91.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 100 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 83.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 101 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | |
| HK0817681-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756) - Continued** | | | | | | | | | | |
| HK0817699-001 | 2108/XRL/EDH33 (3.0M-3.45M) | C9 - C16 Fraction | ---- | 31 mg/kg | 105 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 86.2 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | | | |
| HK0817699-001 | 2108/XRL/EDH33 (3.0M-3.45M) | C6 - C8 Fraction | ---- | 3 mg/kg | 85.0 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem (HK) Pty Ltd** | Page | : **1 of 6** |
| Contact | : **MR TOM LO** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0817678** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **tom@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **11-OCT-2008** |
| Order number | : **----** | | | Issue Date | : **30-OCT-2008** |
| C-O-C number | : **H004110** | | | No. of samples received | : **2** |
| Site | : **----** | | | No. of samples analysed | : **2** |

## 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: 24-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817678**

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

**Water sample(s) analysed and reported on an as received basis.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

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

## Analytical Results

Sub-Matrix: **WATER**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH32 WATER SAMPLE | 2108/XRL/EDH33 WATER SAMPLE | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 11-OCT-2008 14:00 | 11-OCT-2008 14:30 | | | |
| | | | | HK0817678-001 | HK0817678-002 | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | ---- | <0.05 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | <500 | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | <500 | <500 | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | <20 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | ---- | <5 | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | ---- | <50 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | ---- | <50 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | ---- | <50 | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | ---- | <5 | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | ---- | <5 | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | <2 | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | <2 | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | <2 | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | <2 | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | <2 | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | <2 | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | <2 | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | <2 | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | <2 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | <4 | | | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **2108/XRL/EDH32 WATER SAMPLE** | **2108/XRL/EDH33 WATER SAMPLE** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 11-OCT-2008 14:00 | 11-OCT-2008 14:30 | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0817678-001** | **HK0817678-002** | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | | ---- | <4 | | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.10 | µg/L | | ---- | <0.10 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.4** | **102** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.7** | **101** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | **113** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.4** | **102** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.7** | **101** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | **113** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **48.7** | **72.9** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **34.6** | **23.1** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **74.9** | **33.8** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **71.6** | **35.4** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **76.2** | **56.7** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **89.5** | **77.8** | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | ---- | **104** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | |
| HK0817687-003 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | |
| HK0817140-001 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methylene chloride** | 75-09-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 117 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 783970)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 88.7 | ---- | 25 | 90 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 75.8 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900) - Continued** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 108 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 46.0 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 107 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 110 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 96.1 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 790431)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 92.5 | ---- | 65 | 113 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 790432)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 91.4 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | |
| HK0817678-002 | 2108/XRL/EDH33 WATER SAMPLE | **EG036: Mercury** | 7439-97-6 | 0.2 µg/L | 100 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |
| **EP-066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 50 | 130 |

**Site G**

**(2108/XRL/EDH33 to 2108/XRL/EDH36)**

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/589<br>**FILE REF** :<br>**SIGNED** : P.P. John Fung<br>**DATE** : 06 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos. 2108/XRL/EDH32 and 2108/XRL/EDH33 | N | GCE/NEX/2108/2008/S589 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817384 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 2 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 10-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H004107 | | | No. of samples received | : 4 |
| Site | : ---- | | | 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 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: 29-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817384**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 |
| | | | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 12.5 | 17.5 | 18.1 | 10.7 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | ---- | ---- |
| **EG: Metals and Major Cations** | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.3 | <0.2 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 19 | 46 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | 139 | 32 | 61 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 10 | 4 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 169 | 98 | ---- | ---- |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 23 | 13 | ---- | ---- |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics** | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | ---- | ---- |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | ---- | ---- |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 | |
| Compound | CAS Number | LOR | Unit | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | ---- | ---- | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | ---- | ---- | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | ---- | ---- | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | ---- | ---- | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.4 | 87.9 | 89.3 | 91.0 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 98.0 | 96.2 | 96.3 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 103 | 103 | 102 | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.4 | 87.9 | 89.3 | 91.0 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 98.0 | 96.2 | 96.3 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 103 | 103 | 102 | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 26.8 | 41.4 | 44.6 | 40.9 | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 30.0 | 59.4 | 33.0 | 42.8 | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 88.4 | 38.9 | 71.4 | 65.7 | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (0.5M-0.95M) | 2108/XRL/EDH33 (1.5M-1.95M) | 2108/XRL/EDH32 (0.5M-0.95M) | 2108/XRL/EDH32 (1.5M-1.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 10-OCT-2008 14:00 | 10-OCT-2008 15:00 | 10-OCT-2008 14:30 | 10-OCT-2008 15:30 | |
| Compound | CAS Number | LOR | Unit | | HK0817384-001 | HK0817384-002 | HK0817384-003 | HK0817384-004 | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 46.4 | 64.7 | 50.1 | 76.1 | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 54.9 | 52.3 | 47.0 | 60.5 | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 70.6 | 47.1 | 40.7 | 42.0 | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 105 | 81.6 | ---- | ---- | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 87.6 | 71.2 | ---- | ---- | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EA/ED: Physical and Aggregate Properties (QC Lot: 787399)** | | | | | | | | |
| HK0817256-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 14.0 | 11.7 | 17.8 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 791872)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | |
| HK0817256-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.10 | 0.10 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 20 | 19 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 58 | 3.3 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 105 | 109 | 3.6 |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | |
| HK0817384-002 | 2108/XRL/EDH33 (1.5M-1.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | |
| HK0817256-001 | Anonymous | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | |
| HK0817256-001 | Anonymous | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429) - Continued** | | | | | | | | |
| HK0817256-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | Not Authorised | # Not Authorised | # 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | DCS | Recovery Limits (%): Low | High | RPD (%): Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 791872)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | --- | 1.0 | mg/kg | --- | .2 mg/kg | 88.8 | --- | 85 | 115 | --- | --- |
| | | | | <1 | --- | --- | --- | --- | --- | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 793992) - Continued** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 85.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 97.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 103 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 87.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 85.3 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 96.2 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 77.9 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.1 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 93.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.2 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 83.2 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.8 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.6 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | | | | |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | Not Authorised | ---- | # Not Authorised | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 793992)** | | | | | | | | | | |
| HK0817256-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 95.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 80.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 83.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 795515)** | | | | | | | | | | |
| HK0817384-001 | 2108/XRL/EDH33 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787430)** | | | | | | | | | | |
| HK0817256-002 | Anonymous | C6 - C8 Fraction | ---- | 3 mg/kg | 82.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432)** | | | | | | | | | | |
| HK0817256-002 | Anonymous | C9 - C16 Fraction | ---- | 31 mg/kg | 73.7 | ---- | 50 | 130 | ---- | ---- |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 787432) - Continued | | | | | | | | | | |
| HK0817256-002 | Anonymous | C17 - C35 Fraction | --- | 75 mg/kg | 71.6 | --- | 50 | 130 | --- | --- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| EP-080S: TPH(Volatile)/BTEX Surrogate | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| EP-074S: VOC Surrogates | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| 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 |
| EP-066S: PCB Surrogate | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817699 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 11-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H004108 | | | No. of samples received | : 5 |
| Site | : ---- | | | No. of samples analysed | : 5 |

### 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: 29-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817699**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|
| Client sampling date / time | | | | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| | | | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | --- | 0.1 | % | 15.1 | 24.1 | 23.7 | 22.8 | 28.8 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | <1 | --- | <1 | --- | --- |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.3 | --- | <0.2 | --- | --- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 15 | --- | 9 | --- | --- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 155 | 107 | 86 | 44 | 28 |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | --- | --- | <0.20 | --- | --- |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | --- | --- | --- | --- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | --- | 2 | --- | --- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 241 | --- | 87 | --- | --- |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 11 | --- | 4 | --- | --- |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | --- | <1 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | --- | <5 | --- | --- |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | --- | <0.5 | --- | --- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| Compound | CAS Number | LOR | Unit | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | <5.0 | ---- | <5.0 | ---- | ---- |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | ---- | <0.5 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | 0.7 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | ---- | <5.0 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | ---- | <0.2 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | ---- | <0.1 | ---- | ---- |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 81.4 | 82.1 | 83.3 | 81.8 | 84.9 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.3 | 96.8 | 97.1 | 98.3 | 97.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 104 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 81.4 | 82.1 | 83.3 | 81.8 | 84.9 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.3 | 96.8 | 97.1 | 98.3 | 97.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 104 | 103 | 104 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 70.5 | 76.0 | 51.0 | 53.3 | 53.6 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 79.6 | 78.2 | 60.9 | 70.6 | 59.6 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH33 (3.0M-3.45M) | 2108/XRL/EDH32 (3.0M-3.45M) | 2108/XRL/EDH33 (4.5M-4.95M) | 2108/XRL/EDH32 (4.5M-4.95M) | 2108/XRL/EDH32 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 11-OCT-2008 09:10 | 11-OCT-2008 09:25 | 11-OCT-2008 09:55 | 11-OCT-2008 10:15 | 11-OCT-2008 10:50 |
| Compound | CAS Number | LOR | Unit | | HK0817699-001 | HK0817699-002 | HK0817699-003 | HK0817699-004 | HK0817699-005 |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 60.4 | 57.5 | 35.6 | 34.8 | 53.5 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 72.2 | 78.6 | 56.6 | 62.6 | 51.2 |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 53.0 | 55.0 | 45.2 | 45.0 | 46.9 |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 61.8 | 63.0 | 45.4 | 49.8 | 56.2 |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 85.7 | ---- | 65.1 | ---- | ---- |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 84.8 | ---- | 65.0 | ---- | ---- |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 790379)** | | | | | | | | |
| HK0817681-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 17.0 | 16.2 | 5.3 |
| HK0817703-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 13.6 | 12.6 | 8.1 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | |
| HK0818139-003 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | |
| HK0817659-001 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.11 | 0.10 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 32 | 31 | 5.6 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 98 | 96 | 2.2 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 20 | 20 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 260 | 250 | 3.7 |
| HK0817699-002 | 2108/XRL/EDH32 (3.0M-3.45M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 13 | 16 | 18.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 107 | 106 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 196 | 190 | 3.2 |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | |
| HK0817886-007 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | |
| HK0817699-004 | 2108/XRL/EDH32 (4.5M-4.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | |
| HK0817681-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429) - Continued** | | | | | | | | |
| HK0817256-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 787429)** | | | | | | | | |
| HK0817256-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| | | | 207-08-9 | | | | | |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | | | | |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522) - Continued** | | | | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | <1 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 1906 mg/kg | 96.1 | --- | 85 | 115 | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.7 | --- | 85 | 115 | --- | --- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.1 | --- | 85 | 115 | --- | --- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 98.1 | --- | 85 | 115 | --- | --- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | --- | 85 | 115 | --- | --- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | --- | 85 | 115 | --- | --- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.5 | --- | 85 | 115 | --- | --- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 97.0 | --- | 85 | 115 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | <200 | 31 mg/kg | 111 | --- | 45 | 122 | --- | --- |
| C17 - C35 Fraction | --- | 500 | mg/kg | <500 | 75 mg/kg | 99.6 | --- | 50 | 111 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | | | | |
| C6 - C8 Fraction | --- | 5 | mg/kg | <5 | 3 mg/kg | 104 | --- | 63 | 135 | --- | --- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 787429)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | --- | 57 | 144 | --- | --- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | --- | 66 | 128 | --- | --- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | --- | 76 | 134 | --- | --- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 93.4 | --- | 69 | 142 | --- | --- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.2 | --- | 69 | 126 | --- | --- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | --- | 72 | 139 | --- | --- |
| **EP-074B: Oxygenated Compounds (QC Lot: 787429)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 5.0 mg/kg | 83.2 | --- | 16 | 138 | --- | --- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 787429)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | --- | 65 | 134 | --- | --- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | --- | 74 | 128 | --- | --- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 787429)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.8 | --- | 59 | 145 | --- | --- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.6 | --- | 59 | 142 | --- | --- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | --- | 49 | 103 | --- | --- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | --- | 61 | 101 | --- | --- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | --- | 56 | 104 | --- | --- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 125 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 795336)** | | | | | | | | | | |
| HK0817659-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 91.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 100 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 83.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 101 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | |
| HK0817681-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756)** | | | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 789756) - Continued** | | | | | | | | | | |
| HK0817699-001 | 2108/XRL/EDH33 (3.0M-3.45M) | C9 - C16 Fraction | ---- | 31 mg/kg | 105 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 86.2 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 792469)** | | | | | | | | | | |
| HK0817699-001 | 2108/XRL/EDH33 (3.0M-3.45M) | C6 - C8 Fraction | ---- | 3 mg/kg | 85.0 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem (HK) Pty Ltd** | Page | : **1 of 6** |
| Contact | : **MR TOM LO** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0817678** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **tom@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **11-OCT-2008** |
| Order number | : **----** | | | Issue Date | : **30-OCT-2008** |
| C-O-C number | : **H004110** | | | No. of samples received | : **2** |
| Site | : **----** | | | No. of samples analysed | : **2** |

## 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: 24-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817678**

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

**Water sample(s) analysed and reported on an as received basis.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **WATER**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH32 WATER SAMPLE | 2108/XRL/EDH33 WATER SAMPLE | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 11-OCT-2008 14:00 | 11-OCT-2008 14:30 | | | |
| | | | | HK0817678-001 | HK0817678-002 | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | ---- | <0.05 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | <500 | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | <500 | <500 | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | <20 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | ---- | <5 | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | ---- | <50 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | ---- | <50 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | ---- | <50 | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | ---- | <5 | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | ---- | <5 | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | ---- | <5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | <2 | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | <2 | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | <2 | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | <2 | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | <2 | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | <2 | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | <2 | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | <2 | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | <2 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | <4 | | | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **2108/XRL/EDH32 WATER SAMPLE** | **2108/XRL/EDH33 WATER SAMPLE** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 11-OCT-2008 14:00 | 11-OCT-2008 14:30 | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0817678-001** | **HK0817678-002** | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | | ---- | <4 | | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.10 | µg/L | | ---- | <0.10 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.4** | **102** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.7** | **101** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | **113** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.4** | **102** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.7** | **101** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | **113** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **48.7** | **72.9** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **34.6** | **23.1** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **74.9** | **33.8** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **71.6** | **35.4** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **76.2** | **56.7** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **89.5** | **77.8** | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | ---- | **104** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | |
| HK0817687-003 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | |
| HK0817140-001 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methylene chloride** | 75-09-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 117 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 783970)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 88.7 | ---- | 25 | 90 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 75.8 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900) - Continued** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 108 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 46.0 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 107 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 110 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 96.1 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 790431)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 92.5 | ---- | 65 | 113 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 790432)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 91.4 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | |
| HK0817678-002 | 2108/XRL/EDH33 WATER SAMPLE | **EG036: Mercury** | 7439-97-6 | 0.2 µg/L | 100 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |
| **EP-066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

MTR

Project Management - XRL Department

4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT

Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD. 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER CONTRACT NEX/2108 MTR CORPORATION HONG KONG | **CSF No.** : NEX2108/SUB/646 |
|---|---|---|
| | | **FILE REF** : |
| | | **SIGNED** : p.p. John Fung |
| | | **DATE** : 20 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH30 and 2108/XRL/EDH34 | N | GCE/NEX/2108/2008/S646 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk

SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk

GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

PRELIMINARY REPORT FOR REFERENCE ONLY

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 14 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0819723 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRE | Quote number | : ---- | Date Samples Received | : 13-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 20-NOV-2008 14:21 |
| C-O-C number | : H004111 | | | No. of samples received | : 9 |
| Site | : ---- | | | No. of samples analysed | : 9 |

### 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: 13-NOV-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0819723**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## *Analytical Results*

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| | | | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 11.3 | 13.6 | 23.5 | 16.8 | 16.4 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | ---- | ---- | ---- | <1 | <1 |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | ---- | ---- | ---- | 0.4 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 23 | 38 | 13 | 50 | 10 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 91 | 50 | 75 | 36 | 40 |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | ---- | ---- | ---- | 0.09 | 0.14 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | ---- | ---- | ---- | 6 | 8 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | ---- | ---- | ---- | 209 | 84 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 12 | 14 | 5 | 11 | 17 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 700 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 9 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | ---- | ---- | ---- | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | ---- | ---- | ---- | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | ---- | ---- | ---- | ---- | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | ---- | ---- | ---- | ---- | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | ---- | ---- | ---- | ---- | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | ---- | ---- | ---- | ---- | <0.1 | <0.1 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.6 | 111 | 97.6 | 97.5 | 89.8 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 102 | 100 | 99.4 | 98.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 107 | 108 | 105 | 103 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 93.6 | 111 | 97.6 | 97.5 | 89.8 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 102 | 100 | 99.4 | 98.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 107 | 108 | 105 | 103 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 69.5 | 71.2 | 58.2 | 54.6 | 71.4 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 70.0 | 71.4 | 66.6 | 54.6 | 79.1 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 74.1 | 79.1 | 86.2 | 69.9 | 73.6 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (0.5M-0.95M) | 2108/XRL/EDH30 (1.5M-1.95M) | 2108/XRL/EDH30 (3.0M-3.45M) | 2108/XRL/EDH34 (0.5M-0.95M) | 2108/XRL/EDH34 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 09:30 | 13-OCT-2008 10:30 | 13-OCT-2008 11:15 | 13-OCT-2008 10:20 | 13-OCT-2008 13:20 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-001 | HK0819723-002 | HK0819723-003 | HK0819723-004 | HK0819723-005 |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **74.5** | **77.8** | **62.7** | **58.6** | **81.6** |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **74.1** | **73.1** | **78.6** | **58.8** | **86.9** |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **82.9** | **82.3** | **92.6** | **63.1** | **95.1** |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | ---- | ---- | ---- | **53.5** | **81.8** |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | ---- | ---- | ---- | **55.4** | **91.5** |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | --- | 0.1 | % | | 26.4 | 25.2 | 15.8 | 21.4 | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | | ---- | --- | <1 | <1 | |
| **EG: Metals and Major Cations** | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | | --- | --- | <0.2 | <0.2 | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | | 19 | 4 | 12 | 11 | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | | 509 | 14 | 54 | 35 | |
| EG020: Mercury | 7439-97-6 | 0.20 | mg/kg | | --- | --- | 0.05 | <0.05 | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | | --- | --- | 4 | 4 | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | | --- | --- | 262 | 168 | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | | 3 | 9 | 10 | 4 | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | | <1 | <1 | <1 | <1 | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | | <200 | <200 | <200 | <200 | |
| C17 - C35 Fraction | --- | 500 | mg/kg | | <500 | <500 | <500 | <500 | |
| C6 - C8 Fraction | --- | 5 | mg/kg | | <5 | <5 | <5 | <5 | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Toluene | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Styrene | 100-42-5 | 0.5 | mg/kg | | ---- | ---- | <0.5 | <0.5 | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | | ---- | --- | <5 | <5 | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | | --- | --- | <5 | <5 | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | | --- | --- | <5 | <5 | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | | --- | --- | <0.5 | <0.5 | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | --- | --- | <5.0 | <5.0 | |
| **EP-075A: Phenols** | | | | | | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 |
| **EP-075A: Phenols - Continued** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | ---- | ---- | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | ---- | ---- | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | ---- | ---- | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | ---- | ---- | <0.1 | <0.1 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 91.4 | 87.9 | 95.3 | 94.2 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 99.9 | 98.6 | 101 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 103 | 102 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 91.4 | 87.9 | 95.3 | 94.2 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 99.9 | 98.6 | 101 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 104 | 104 | 103 | 102 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 48.2 | 70.0 | 77.2 | 46.4 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 67.3 | 74.5 | 74.5 | 63.2 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 27.8 | 72.4 | 72.9 | 35.2 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH30 (4.5M-4.95M) | 2108/XRL/EDH30 (6.0M-6.45M) | 2108/XRL/EDH34 (3.0M-3.45M) | 2108/XRL/EDH34 (4.5M-4.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-OCT-2008 13:40 | 13-OCT-2008 15:50 | 13-OCT-2008 15:15 | 13-OCT-2008 16:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | HK0819723-006 | HK0819723-007 | HK0819723-008 | HK0819723-009 | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | 64.6 | 83.5 | 79.4 | 75.5 | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | 99.4 | 90.1 | 88.4 | 85.2 | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | 98.5 | 99.0 | 97.4 | 94.6 | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | ---- | ---- | 98.5 | 78.3 | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | ---- | ---- | 106 | 82.7 | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 807971)** | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 13.6 | 12.6 | 7.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 811951)** | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | |
| HK0819526-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 52 | 57 | 9.5 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0819723-007 | 2108/XRL/EDH30 (6.0M-6.45M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 14 | 15 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 174 | 156 | 10.7 |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | |
| HK0819723-005 | 2108/XRL/EDH34 (1.5M-1.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | |
| HK0817256-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121) - Continued** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 808121)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399)** | | | | | | | | |
| HK0819151-001 | Anonymous | Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127) - Continued** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Bis(2-ethylhexyl)phthalate | 117-81-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 808127)** | | | | | | | | |
| HK0819723-001 | 2108/XRL/EDH30 (0.5M-0.95M) | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 808128)** | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 811951)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .19062 mg/kg<br>---- | 89.9<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.1 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 98.0 | ---- | 85 | 115 | ---- | ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 809209) - Continued** | | | | | | | | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 96.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 111 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 130 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | ---- | # Not Authorised | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | ---- | # Not Authorised | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 808121)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 99.1 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 89.1 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 808121)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 52.7 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 808121)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.9 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 808121)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 808127)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.3 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.9 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.2 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.9 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.6 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.6 | ---- | 69 | 106 | ---- | ---- |

Matrix: SOIL

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 802399) - Continued** | | | | | | | | | | | |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.4 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.7 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.5 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 68 | 112 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 808127)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.9 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.7 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.1 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.7 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.4 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.6 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.0 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 82.0 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.9 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.6 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 808127)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.4 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 808128)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 105 | ---- | 59 | 152 | ---- | ---- |

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

Matrix: SOIL

| | | | | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Concentration | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 809209)** | | | | | | | | | | |
| HK0819526-001 | Anonymous | | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 809209) - Continued** | | | | | | | | | | |
| HK0819526-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 98.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 100 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | 86.0 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 809280)** | | | | | | | | | | |
| HK0819723-004 | 2108/XRL/EDH34 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 811943)** | | | | | | | | | | |
| HK0817256-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808122)** | | | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 106 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 808125)** | | | | | | | | | | |
| HK0819723-002 | 2108/XRL/EDH30 (1.5M-1.95M) | C9 - C16 Fraction | ---- | ---- | # Not Authorised | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | ---- | # Not Authorised | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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** | | | |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| *Compound* | *CAS Number* | *Low* | *High* |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 23 | 120 |
| 2-Fluorobiphenyl | 321-60-8 | 30 | 115 |
| 4-Terphenyl-d14 | 1718-51-0 | 20 | 137 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 13 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817687 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 14-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 05-NOV-2008 |
| C-O-C number | : H004112 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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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** | **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: 30-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817687**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

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

**Water sample(s) analysed and reported on an as received basis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH37 (3.90M-4.80M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 14-OCT-2008 09:35 | | | | |
| | | | | HK0817687-002 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 35.7 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 137 | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Chromium | 7440-47-3 | 1 | mg/kg | 17 | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | | | | |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | | | | |
| EG020: Silver | 7440-22-4 | 0.1 | mg/kg | 0.2 | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | | | | |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 50 | µg/kg | <50 | | | | |
| Acenaphthylene | 208-96-8 | 50 | µg/kg | <50 | | | | |
| Acenaphthene | 83-32-9 | 50 | µg/kg | <50 | | | | |
| Fluorene | 86-73-7 | 50 | µg/kg | <50 | | | | |
| Phenanthrene | 85-01-8 | 50 | µg/kg | <50 | | | | |
| Anthracene | 120-12-7 | 50 | µg/kg | <50 | | | | |
| Fluoranthene | 206-44-0 | 150 | µg/kg | <150 | | | | |
| Pyrene | 129-00-0 | 150 | µg/kg | <150 | | | | |
| Benz(a)anthracene | 56-55-3 | 150 | µg/kg | <150 | | | | |
| Chrysene | 218-01-9 | 150 | µg/kg | <150 | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 300 | µg/kg | <300 | | | | |
| Benzo(a)pyrene | 50-32-8 | 150 | µg/kg | <150 | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 150 | µg/kg | <150 | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 150 | µg/kg | <150 | | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 150 | µg/kg | <150 | | | | |
| Low M.W. PAHs | ---- | 550 | µg/kg | <550 | | | | |
| High M.W. PAHs | ---- | 1700 | µg/kg | <1700 | | | | |
| **EP-065: PCB Single Congeners** | | | | | | | | |
| PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | | | | |
| PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | | | | |
| PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | | | | |
| PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | | | | |
| PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH37 (3.90M-4.80M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0817687-002 | | | |
| **EP-065: PCB Single Congeners - Continued** | | | | | | | | |
| PCB 66 | 32598-10-0 | 3 | µg/kg | | <3 | | | |
| PCB 101 | 37680-73-2 | 3 | µg/kg | | <3 | | | |
| PCB 77 | 32598-13-3 | 3 | µg/kg | | <3 | | | |
| PCB 149 | 38380-04-0 | 3 | µg/kg | | <3 | | | |
| PCB 118 | 31508-00-6 | 3 | µg/kg | | <3 | | | |
| PCB 153 | 35065-27-1 | 3 | µg/kg | | <3 | | | |
| PCB 105 | 32598-14-4 | 3 | µg/kg | | <3 | | | |
| PCB 138 | 35065-28-2 | 3 | µg/kg | | <3 | | | |
| PCB 126 | 57465-28-8 | 3 | µg/kg | | <3 | | | |
| PCB 187 | 52663-68-0 | 3 | µg/kg | | <3 | | | |
| PCB 128 | 38380-07-3 | 3 | µg/kg | | <3 | | | |
| PCB 156 | 38380-08-4 | 3 | µg/kg | | <3 | | | |
| PCB 180 | 35065-29-3 | 3 | µg/kg | | <3 | | | |
| PCB 169 | 60044-26-0 | 3 | µg/kg | | <3 | | | |
| PCB 170 | 35065-30-6 | 3 | µg/kg | | <3 | | | |
| PCB 195 | 52663-78-2 | 3 | µg/kg | | <3 | | | |
| PCB 206 | 40186-72-9 | 3 | µg/kg | | <3 | | | |
| **EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 57.8 | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 92.9 | | | |
| **EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | 99.2 | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH34 (WATER SAMPLE) | 2108/XRL/EDH30 (WATER SAMPLE) |
|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:50 | 14-OCT-2008 09:55 |
| Compound | CAS Number | LOR | Unit | | HK0817687-003 | HK0817687-004 |
| **EG: Metals and Major Cations - Filtered** | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | | <0.05 | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | |
| C9 - C16 Fraction | ---- | 500 | µg/L | | <500 | <500 |
| C17 - C35 Fraction | ---- | 500 | µg/L | | <500 | <500 |
| C6 - C8 Fraction | ---- | 20 | µg/L | | <20 | <20 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | | <5 | <5 |
| Toluene | 108-88-3 | 5 | µg/L | | <5 | <5 |
| Ethylbenzene | 100-41-4 | 5 | µg/L | | <5 | <5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 |
| Styrene | 100-42-5 | 5 | µg/L | | <5 | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | | <5 | <5 |
| **EP-074B: Oxygenated Compounds** | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | | <50 | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | | <50 | ---- |
| **EP-074E: Halogenated Aliphatics** | | | | | | |
| Methylene chloride | 75-09-2 | 50 | µg/L | | <50 | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | | <5 | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | | <5 | ---- |
| **EP-074G: Trihalomethanes (THM)** | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | | 5 | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | | <5 | ---- |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | | <5 | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | | <2 | <2 |
| Acenaphthylene | 208-96-8 | 2 | µg/L | | <2 | <2 |
| Acenaphthene | 83-32-9 | 2 | µg/L | | <2 | <2 |
| Fluorene | 86-73-7 | 2 | µg/L | | <2 | <2 |
| Phenanthrene | 85-01-8 | 2 | µg/L | | <2 | <2 |
| Anthracene | 120-12-7 | 2 | µg/L | | <2 | <2 |
| Fluoranthene | 206-44-0 | 2 | µg/L | | <2 | <2 |
| Pyrene | 129-00-0 | 2 | µg/L | | <2 | <2 |
| Chrysene | 218-01-9 | 2 | µg/L | | <2 | <2 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | | <4 | <4 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH34 (WATER SAMPLE) | 2108/XRL/EDH30 (WATER SAMPLE) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-OCT-2008 09:50 | 14-OCT-2008 09:55 | | |
| Compound | CAS Number | LOR | Unit | | HK0817687-003 | HK0817687-004 | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | | <4 | --- | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.10 | µg/L | | <0.10 | --- | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 94.4 | 98.0 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 102 | 101 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 112 | 110 | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 94.4 | 98.0 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 102 | 101 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 112 | 110 | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 61.0 | 39.6 | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 59.0 | 30.4 | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 49.2 | 71.8 | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 49.6 | 52.5 | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 52.4 | 55.5 | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 80.4 | 97.2 | | |
| **EP-066S: PCB Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | 99.9 | --- | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 790379)** | | | | | | | | |
| HK0817681-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 17.0 | 16.2 | 5.3 |
| HK0817703-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 13.6 | 12.6 | 8.1 |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Silver | 7440-22-4 | 0.1 | mg/kg | 0.2 | 0.2 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 137 | 118 | 14.6 |
| | | EG020: Chromium | 7440-47-3 | 1 | mg/kg | 17 | 14 | 16.1 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | 29 | 5.2 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | 77 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | 120 | 0.0 |
| HK0818139-002 | Anonymous | EG020: Silver | 7440-22-4 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Arsenic | 7440-38-2 | 1 | mg/kg | 3 | 4 | 0.0 |
| | | EG020: Chromium | 7440-47-3 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 23 | 23 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 140 | 125 | 11.5 |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | Fluoranthene | 206-44-0 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Pyrene | 129-00-0 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Chrysene | 218-01-9 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 150 | µg/kg | <150 | <150 | 0.0 |
| | | High M.W. PAHs | --- | 1700 | µg/kg | <1700 | <1700 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 300 | µg/kg | <300 | <300 | 0.0 |
| | | Naphthalene | 91-20-3 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Acenaphthene | 83-32-9 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Fluorene | 86-73-7 | 50 | µg/kg | <50 | <50 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757) - Continued** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | Phenanthrene | 85-01-8 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Anthracene | 120-12-7 | 50 | µg/kg | <50 | <50 | 0.0 |
| | | Low M.W. PAHs | --- | 550 | µg/kg | <550 | <550 | 0.0 |
| **EP-065: PCB Single Congeners (QC Lot: 789758)** | | | | | | | | |
| HK0817687-002 | 2108/XRL/EDH37 (3.90M-4.80M) | PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 66 | 32598-10-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 101 | 37680-73-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 77 | 32598-13-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 149 | 38380-04-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 118 | 31508-00-6 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 153 | 35065-27-1 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 105 | 32598-14-4 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 138 | 35065-28-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 126 | 57465-28-8 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 187 | 52663-68-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 128 | 38380-07-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 156 | 38380-08-4 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 180 | 35065-29-3 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 169 | 60044-26-0 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 170 | 35065-30-6 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 195 | 52663-78-2 | 3 | µg/kg | <3 | <3 | 0.0 |
| | | PCB 206 | 40186-72-9 | 3 | µg/kg | <3 | <3 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | |
| HK0817687-003 | 2108/XRL/EDH34 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | |
| HK0817140-001 | Anonymous | C6 - C8 Fraction | --- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | Benzene | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Toluene | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900) - Continued** | | | | | | | | |
| HK0817675-001 | Anonymous | Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Styrene | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Methylene chloride | 75-09-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Trichloroethene | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Chloroform | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | Spike Recovery (%): DCS | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | | | | |
| EG020: Arsenic | 7440-38-2 | 1 | mg/kg | <1 | 5 mg/kg | 94.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Chromium | 7440-47-3 | 1 | mg/kg | <1 | 5 mg/kg | 86.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Silver | 7440-22-4 | 0.1 | mg/kg | <0.1 | 5 mg/kg | 86.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 5 | µg/kg | ---- | 49.9 µg/kg | 71.1 | ---- | 37 | 127 | ---- | ---- |
| | | | | <10 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Acenaphthylene | 208-96-8 | 5 | µg/kg | <5 | 50.9 µg/kg | 69.5 | ---- | 26 | 119 | ---- | ---- |
| Acenaphthene | 83-32-9 | 5 | µg/kg | <5 | 50.4 µg/kg | 68.3 | ---- | 36 | 111 | ---- | ---- |
| Fluorene | 86-73-7 | 5 | µg/kg | <5 | 51.0 µg/kg | 57.2 | ---- | 40 | 113 | ---- | ---- |
| Phenanthrene | 85-01-8 | 5 | µg/kg | <5 | 51.2 µg/kg | 90.1 | ---- | 35 | 120 | ---- | ---- |
| Anthracene | 120-12-7 | 5 | µg/kg | <5 | 50.7 µg/kg | 83.5 | ---- | 24 | 118 | ---- | ---- |
| Fluoranthene | 206-44-0 | 5 | µg/kg | <5 | 51.0 µg/kg | 92.2 | ---- | 46 | 120 | ---- | ---- |
| Pyrene | 129-00-0 | 5 | µg/kg | <5 | 51.1 µg/kg | 101 | ---- | 42 | 126 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 789757) - Continued** | | | | | | | | | | | |
| Benz(a)anthracene | 56-55-3 | 5 | µg/kg | <5 | 50.1 µg/kg | 60.8 | ---- | 35 | 140 | ---- | ---- |
| Chrysene | 218-01-9 | 5 | µg/kg | <5 | 50.8 µg/kg | 59.7 | ---- | 46 | 139 | ---- | ---- |
| Benzo(b) & | 205-99-2 207-08-9 | 5 | µg/kg | ---- | 101.9 µg/kg | 64.7 | ---- | 41 | 141 | ---- | ---- |
| Benzo(k)fluoranthene | | | | <10 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 5 | µg/kg | <5 | 50.7 µg/kg | 58.5 | ---- | 20 | 134 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 5 | µg/kg | <5 | 49.0 µg/kg | 70.9 | ---- | 32 | 159 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 5 | µg/kg | <5 | 50.2 µg/kg | 64.8 | ---- | 31 | 150 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 5 | µg/kg | <5 | 50.7 µg/kg | 65.9 | ---- | 40 | 148 | ---- | ---- |
| Low M.W. PAHs | ---- | 5 | µg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| High M.W. PAHs | ---- | 5 | µg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-065: PCB Single Congeners (QC Lot: 789758)** | | | | | | | | | | | |
| PCB 8 | 34883-43-7 | 3 | µg/kg | <3 | 5 µg/kg | 106 | ---- | 51 | 119 | ---- | ---- |
| PCB 18 | 37680-65-2 | 3 | µg/kg | <3 | 5 µg/kg | 107 | ---- | 19 | 134 | ---- | ---- |
| PCB 28 | 7012-37-5 | 3 | µg/kg | <3 | 5 µg/kg | 81.7 | ---- | 52 | 107 | ---- | ---- |
| PCB 52 | 35693-99-3 | 3 | µg/kg | <3 | 5 µg/kg | 114 | ---- | 32 | 119 | ---- | ---- |
| PCB 44 | 41464-39-5 | 3 | µg/kg | <3 | 5 µg/kg | 92.5 | ---- | 29 | 118 | ---- | ---- |
| PCB 66 | 32598-10-0 | 3 | µg/kg | <3 | 5 µg/kg | 91.6 | ---- | 50 | 109 | ---- | ---- |
| PCB 101 | 37680-73-2 | 3 | µg/kg | <3 | 5 µg/kg | 86.0 | ---- | 35 | 150 | ---- | ---- |
| PCB 77 | 32598-13-3 | 3 | µg/kg | <3 | 5 µg/kg | 110 | ---- | 53 | 134 | ---- | ---- |
| PCB 149 | 38380-04-0 | 3 | µg/kg | <3 | 5 µg/kg | 72.4 | ---- | 23 | 148 | ---- | ---- |
| PCB 118 | 31508-00-6 | 3 | µg/kg | <3 | 5 µg/kg | 119 | ---- | 43 | 144 | ---- | ---- |
| PCB 153 | 35065-27-1 | 3 | µg/kg | <3 | 5 µg/kg | 120 | ---- | 41 | 144 | ---- | ---- |
| PCB 105 | 32598-14-4 | 3 | µg/kg | <3 | 5 µg/kg | 110 | ---- | 50 | 142 | ---- | ---- |
| PCB 138 | 35065-28-2 | 3 | µg/kg | <3 | 5 µg/kg | 117 | ---- | 43 | 153 | ---- | ---- |
| PCB 126 | 57465-28-8 | 3 | µg/kg | <3 | 5 µg/kg | 86.3 | ---- | 46 | 142 | ---- | ---- |
| PCB 187 | 52663-68-0 | 3 | µg/kg | <3 | 5 µg/kg | 113 | ---- | 42 | 142 | ---- | ---- |
| PCB 128 | 38380-07-3 | 3 | µg/kg | <3 | 5 µg/kg | 113 | ---- | 42 | 145 | ---- | ---- |
| PCB 156 | 38380-08-4 | 3 | µg/kg | <3 | 5 µg/kg | 107 | ---- | 44 | 134 | ---- | ---- |
| PCB 180 | 35065-29-3 | 3 | µg/kg | <3 | 5 µg/kg | 120 | ---- | 51 | 136 | ---- | ---- |
| PCB 169 | 60044-26-0 | 3 | µg/kg | <3 | 5 µg/kg | 93.3 | ---- | 46 | 136 | ---- | ---- |
| PCB 170 | 35065-30-6 | 3 | µg/kg | <3 | 5 µg/kg | 102 | ---- | 43 | 139 | ---- | ---- |
| PCB 195 | 52663-78-2 | 3 | µg/kg | <3 | 5 µg/kg | 101 | ---- | 47 | 136 | ---- | ---- |
| PCB 206 | 40186-72-9 | 3 | µg/kg | <3 | 5 µg/kg | 98.6 | ---- | 38 | 140 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567)** | | | | | | | | | | | |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 782567) - Continued** | | | | | | | | | | | |
| C6 - C8 Fraction | --- | 0.02 | mg/L | <0.02 | --- | --- | --- | --- | --- | --- | --- |
| | | | | --- | 0.15 mg/L | 117 | --- | 50 | 130 | --- | --- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 783970)** | | | | | | | | | | | |
| C9 - C16 Fraction | --- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 88.7 | --- | 25 | 90 | --- | --- |
| C17 - C35 Fraction | --- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 75.8 | --- | 29 | 116 | --- | --- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | --- | 54 | 132 | --- | --- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | --- | 59 | 128 | --- | --- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | --- | 68 | 125 | --- | --- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | --- | 75 | 122 | --- | --- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 108 | --- | 73 | 119 | --- | --- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | --- | 72 | 125 | --- | --- |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | --- | --- | --- | --- | --- | --- | --- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 46.0 | --- | 63 | 126 | --- | --- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | --- | --- | --- | --- | --- | --- | --- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 107 | --- | 67 | 125 | --- | --- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 110 | --- | 59 | 126 | --- | --- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 96.1 | --- | 68 | 123 | --- | --- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 104 | --- | 77 | 120 | --- | --- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | --- | --- | --- | --- | --- | --- | --- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | --- | 42 | 113 | --- | --- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | --- | 42 | 120 | --- | --- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | --- | 44 | 115 | --- | --- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | --- | 47 | 116 | --- | --- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | --- | 51 | 112 | --- | --- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | --- | 51 | 113 | --- | --- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | --- | 63 | 112 | --- | --- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | --- | 64 | 113 | --- | --- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | --- | 62 | 116 | --- | --- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | --- | 65 | 114 | --- | --- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 790431)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 92.5 | --- | 65 | 113 | --- | --- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 790432)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 91.4 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 790360)** | | | | | | | | | | |
| HK0817678-002 | Anonymous | EG036: Mercury | 7439-97-6 | 0.2 µg/L | 100 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 50 | 130 |
| 4-Terphenyl-d14 | 1718-51-0 | 50 | 130 |
| **EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate** | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

Sub-Matrix: WATER

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| 2-Fluorophenol | 367-12-4 | 21 | 100 |
| Phenol-d6 | 13127-88-3 | 20 | 94 |
| 2.4.6-Tribromophenol | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| Nitrobenzene -d5 | 4165-60-0 | 35 | 114 |
| 2-Fluorobiphenyl | 321-60-8 | 43 | 116 |
| 4-Terphenyl-d14 | 1718-51-0 | 33 | 141 |

| Sub-Matrix: WATER | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-066S: PCB Surrogate | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 16 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0818139 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 18-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 17-NOV-2008 |
| C-O-C number | : H004116 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 4 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 30-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0818139**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH35 (0.5M-0.95M) | 2108/XRL/EDH35 (1.5M-1.95M) | 2108/XRL/EDH35 (3.0M-3.45M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 18-OCT-2008 09:50 | 18-OCT-2008 10:30 | 18-OCT-2008 15:00 | | |
| | | | | HK0818139-001 | HK0818139-002 | HK0818139-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **20.5** | **21.5** | **17.5** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **30** | **9** | **15** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **55** | **23** | **63** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **7** | **3** | **5** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **130** | **140** | **117** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **13** | **8** | **16** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **trans-1.2-Dichloroethene** | 156-60-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH35 (0.5M-0.95M) | 2108/XRL/EDH35 (1.5M-1.95M) | 2108/XRL/EDH35 (3.0M-3.45M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 18-OCT-2008 09:50 | 18-OCT-2008 10:30 | 18-OCT-2008 15:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0818139-001 | HK0818139-002 | HK0818139-003 | | |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | **12.2** | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **104** | **103** | **103** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **101** | **100** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **102** | **101** | **102** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **104** | **103** | **103** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **101** | **100** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **102** | **101** | **102** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | **81.6** | **78.5** | **71.1** | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | **74.1** | **89.9** | **63.2** | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH35 (0.5M-0.95M) | 2108/XRL/EDH35 (1.5M-1.95M) | 2108/XRL/EDH35 (3.0M-3.45M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 18-OCT-2008 09:50 | 18-OCT-2008 10:30 | 18-OCT-2008 15:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0818139-001 | HK0818139-002 | HK0818139-003 | | |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **40.5** | **98.0** | **96.9** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **85.2** | **74.9** | **69.6** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **90.0** | **91.2** | **92.0** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **95.8** | **92.8** | **82.5** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **73.6** | **90.4** | **72.8** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **75.2** | **62.5** | **67.2** | | |

| Sub-Matrix: WATER | | | Client sample ID | 2108/XRL/EDH35 (WATER SAMPLE) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 18-OCT-2008 16:10 | | | | |
| Compound | CAS Number | LOR | Unit | HK0818139-004 | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | **1100** | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **2108/XRL/EDH35 (WATER SAMPLE)** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 18-OCT-2008 16:10 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0818139-004** | | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | | <4 | | | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.10 | µg/L | | <0.10 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **103** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **106** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **103** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **106** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **112** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **29.8** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **21.2** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **43.7** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **43.0** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **49.1** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **46.7** | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | **86.7** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 793812)** | | | | | | | | |
| HK0817886-001 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 20.5 | 20.8 | 1.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | |
| HK0818139-003 | 2108/XRL/EDH35 (3.0M-3.45M) | **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797220)** | | | | | | | | |
| HK0817992-011 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0818139-002 | 2108/XRL/EDH35 (1.5M-1.95M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | |
| HK0817687-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 27 | 29 | 5.2 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 75 | 77 | 2.8 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 9 | 8 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 121 | 120 | 0.0 |
| HK0818139-002 | 2108/XRL/EDH35 (1.5M-1.95M) | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 23 | 23 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 140 | 125 | 11.5 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | |
| HK0817886-001 | Anonymous | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | |
| HK0817886-001 | Anonymous | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: SOIL

| | | | | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **trans-1.2-Dichloroethene** | 156-60-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172) - Continued** | | | | | | | | |
| HK0817886-001 | Anonymous | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | |
| HK0818139-004 | 2108/XRL/EDH35 (WATER SAMPLE) | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methylene chloride** | 75-09-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900) - Continued** | | | | | | | | |
| HK0817675-001 | Anonymous | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | |
| HK0817675-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1<br>---- | ----<br>.1906 mg/kg | ----<br>96.1 | ----<br>---- | ----<br>85 | ----<br>115 | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 797220)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 110 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 75.4 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.4 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5<br>---- | ----<br>5.0 mg/kg | ----<br>115 | ----<br>---- | ----<br>16 | ----<br>138 | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| **trans-1.2-Dichloroethene** | 156-60-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 42 | 144 | ---- | ---- |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166) - Continued** | | | | | | | | | | | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 49 | 103 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.0 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.8 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.7 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.0 | ---- | 60 | 104 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172) - Continued** | | | | | | | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.5 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 88.6 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 125 | ---- | 56 | 141 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 794600)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 2 µg/L | 102 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 71.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795224)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 67.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 96.3 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 790900)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 94.0 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 84.6 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 109 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 108 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 101 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 790900)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 46.0 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 790900)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 107 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 110 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 96.1 | ---- | 68 | 123 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-074G: Trihalomethanes (THM) (QC Lot: 790900) - Continued** | | | | | | | | | | | |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 104 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 790900)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 790431)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 87.4 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 81.2 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 67.8 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 85.9 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 84.4 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 96.3 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.0 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 102 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 83.2 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 790431)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 92.5 | ---- | 65 | 113 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 790432)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 91.4 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 797220)** | | | | | | | | | | |
| HK0817992-010 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | |
| HK0817886-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 93.8 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | |
| HK0817886-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 62.4 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 61.3 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) | Recovery Limits (%) | RPD (%) |
|---|---|---|---|

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | MS Spike Recovery (%) | MSD | Low Recovery Limits (%) | High | Value RPD (%) | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 794600)** | | | | | | | | | | |
| HK0818139-004 | 2108/XRL/EDH35 (WATER SAMPLE) | **EG036: Mercury** | 7439-97-6 | 2 µg/L | 91.0 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | Recovery Limits (%) | |
|---|---|---|---|
| | | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%) | |
|---|---|---|---|
| | | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |
| **EP-066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/593<br>**FILE REF** :<br>**SIGNED** : P. P. John Fung<br>**DATE** : 06 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH31 and 2108/XRL/EDH36 | N | GCE/NEX/2108/2008/S593 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*
N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.
c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 10 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0817886 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 15-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 06-NOV-2008 |
| C-O-C number | : H004113 | | | No. of samples received | : 7 |
| Site | : ---- | | | No. of samples analysed | : 5 |

## 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: 30-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0817886**

**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.**

**Sample(s) as received, digested by in-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|
| Client sampling date / time | | | | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| | | | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 20.5 | 17.7 | 15.6 | 14.6 | 25.6 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | ---- | ---- | <1 | <1 | ---- |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 11 | 17 | 7 | 23 | 13 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 110 | 74 | 30 | 46 | 30 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 6 | 6 | 4 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 337 | 118 | 70 | 82 | 250 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 8 | 9 | 12 | 20 | 7 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| Compound | CAS Number | LOR | Unit | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | | --- | --- | <0.1 | <0.1 | --- |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 96.0 | 100 | 98.2 | 97.7 | 94.7 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 100 | 100 | 99.8 | 99.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 101 | 101 | 101 | 101 |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 96.0 | 100 | 98.2 | 97.7 | 94.7 |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 100 | 100 | 100 | 99.8 | 99.8 |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 102 | 101 | 101 | 101 | 101 |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 68.2 | 55.4 | 71.2 | 69.9 | 83.0 |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 61.1 | 46.5 | 65.3 | 61.7 | 78.0 |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 69.3 | 62.8 | 75.6 | 85.9 | 69.0 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH31 (0.5M-0.95M) | 2108/XRL/EDH31 (1.5M-1.95M) | 2108/XRL/EDH36 (0.5M-0.95M) | 2108/XRL/EDH36 (1.5M-1.95M) | 2108/XRL/EDH31 (6.0M-6.45M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 15-OCT-2008 09:30 | 15-OCT-2008 10:40 | 15-OCT-2008 13:40 | 15-OCT-2008 15:00 | 15-OCT-2008 15:15 |
| Compound | CAS Number | LOR | Unit | | HK0817886-001 | HK0817886-002 | HK0817886-004 | HK0817886-005 | HK0817886-007 |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 68.3 | 53.7 | 65.5 | 92.2 | 94.8 |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 69.6 | 62.2 | 62.0 | 57.0 | 94.2 |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 97.4 | 97.0 | 96.6 | 91.2 | 98.8 |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | ---- | ---- | 58.2 | 80.1 | ---- |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | ---- | ---- | 72.8 | 74.7 | ---- |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 793812)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 20.5 | 20.8 | 1.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | |
| HK0818139-003 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | |
| HK0817886-007 | 2108/XRL/EDH31 (6.0M-6.45M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | |
| HK0817687-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 27 | 29 | 5.2 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 75 | 77 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 9 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 121 | 120 | 0.0 |
| HK0818139-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 23 | 23 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 140 | 125 | 11.5 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166) - Continued** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 792478)** | | | | | | | | |
| HK0817992-005 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | 2108/XRL/EDH31 (0.5M-0.95M) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434) - Continued** | | | | | | | | |
| HK0817384-001 | Anonymous | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | |
| HK0817384-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | |
| HK0817384-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 798522)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | .1906 mg/kg | 96.1 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 97.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 797789)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165) - Continued** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 110 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 75.4 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 81.4 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 792478)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 91.0 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 100 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.6 | ---- | 72 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 792478)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 113 | ---- | 16 | 138 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 115 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 792478)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 74 | 128 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 792478)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.9 | ---- | 59 | 142 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 787434)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 49 | 103 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 787434)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.8 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.5 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.2 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.5 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.3 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.6 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 787434)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 86.3 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 787433)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 125 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 797219)** | | | | | | | | | | |
| HK0817681-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 79.0 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795165)** | | | | | | | | | | |
| HK0817886-002 | 2108/XRL/EDH31 (1.5M-1.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 93.8 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795171)** | | | | | | | | | | |
| HK0817886-002 | 2108/XRL/EDH31 (1.5M-1.95M) | C9 - C16 Fraction | ---- | 31 mg/kg | 62.4 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 61.3 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| | Recovery Limits (%) |
|---|---|

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/643<br>**FILE REF** :<br>**SIGNED** : p.p. John Fung<br>**DATE** : 19 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole nos.2108/XRL/EDH31 and 2108/XRL/EDH36 | N | GCE/NEX/2108/2008/S643 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 15 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0818773 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 16-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 19-NOV-2008 |
| C-O-C number | : H004114 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 31-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0818773**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 19.0 | | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 2.4 | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 37 | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 194 | | | | |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 407 | | | | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 4 | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | | | | |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | | | | |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | | | | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | | |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | | | | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | | | | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | | | | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | | | | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | | | | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | | | | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | | | | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | | | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | | | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | <0.1 | | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 92.9 | | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 99.8 | | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 100 | | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 92.9 | | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 99.8 | | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 100 | | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | 56.8 | | | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | 61.1 | | | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | 48.7 | | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH36 (4.5M-4.95M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 10:35 | | | | |
| Compound | CAS Number | LOR | Unit | HK0818773-003 | | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | 55.9 | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | 48.6 | | | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | 55.8 | | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | 74.1 | | | | | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | 64.6 | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH31 (WATER SAMPLE) | 2108/XRL/EDH36 (WATER SAMPLE) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 09:35 | 16-OCT-2008 13:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0818773-001 | HK0818773-004 | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | | <0.05 | <0.05 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| C9 - C16 Fraction | --- | 500 | µg/L | | <500 | <500 | | | |
| C17 - C35 Fraction | --- | 500 | µg/L | | <500 | <500 | | | |
| C6 - C8 Fraction | --- | 20 | µg/L | | <20 | <20 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | | <5 | <5 | | | |
| Toluene | 108-88-3 | 5 | µg/L | | <5 | <5 | | | |
| Ethylbenzene | 100-41-4 | 5 | µg/L | | <5 | <5 | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 | | | |
| Styrene | 100-42-5 | 5 | µg/L | | <5 | <5 | | | |
| ortho-Xylene | 95-47-6 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | | <50 | <50 | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | | <50 | <50 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| Methylene chloride | 75-09-2 | 50 | µg/L | | <50 | <50 | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | | <5 | <5 | | | |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | | 8 | 6 | | | |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | | <5 | <5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | | <2 | <2 | | | |
| Acenaphthylene | 208-96-8 | 2 | µg/L | | <2 | <2 | | | |
| Acenaphthene | 83-32-9 | 2 | µg/L | | <2 | <2 | | | |
| Fluorene | 86-73-7 | 2 | µg/L | | <2 | <2 | | | |
| Phenanthrene | 85-01-8 | 2 | µg/L | | <2 | <2 | | | |
| Anthracene | 120-12-7 | 2 | µg/L | | <2 | <2 | | | |
| Fluoranthene | 206-44-0 | 2 | µg/L | | <2 | <2 | | | |
| Pyrene | 129-00-0 | 2 | µg/L | | <2 | <2 | | | |
| Chrysene | 218-01-9 | 2 | µg/L | | <2 | <2 | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | | <4 | <4 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |

| Sub-Matrix: WATER | | | | Client sample ID | 2108/XRL/EDH31 (WATER SAMPLE) | 2108/XRL/EDH36 (WATER SAMPLE) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 16-OCT-2008 09:35 | 16-OCT-2008 13:35 | | | |
| Compound | CAS Number | LOR | Unit | | HK0818773-001 | HK0818773-004 | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | | <4 | <4 | | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | --- | 0.01 | µg/L | | --- | <0.01 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 103 | 105 | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 98.2 | 99.8 | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 107 | 113 | | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 103 | 105 | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 98.2 | 99.8 | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 107 | 113 | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 33.0 | 33.6 | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 37.1 | 23.7 | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 20.4 | 20.8 | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 43.6 | 38.2 | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 48.2 | 49.4 | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 42.5 | 39.4 | | | |
| **EP-066S: PCB Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | --- | 94.2 | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 800160)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 19.0 | 21.7 | 13.3 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 7 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 52 | 53 | 2.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 74 | 80 | 8.8 |
| HK0818774-003 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.4 | 0.3 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 13 | 9.3 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | 56 | 4.4 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 11 | 10 | 13.4 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 108 | 129 | 17.1 |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166) - Continued** | | | | | | | | |
| HK0817886-001 | Anonymous | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 795166)** | | | | | | | | |
| HK0817886-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | |
| HK0817886-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 799890)** | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | Total Polychlorinated biphenyls | --- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685) - Continued** | | | | | | | | |
| HK0818773-004 | 2108/XRL/EDH36 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | |
| HK0818139-004 | Anonymous | C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | meta- & para-Xylene | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | Benzene | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Toluene | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Styrene | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Trichloroethene | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Chloroform | 67-66-3 | 5 | µg/L | 8 | 9 | 20.7 |
| | | Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 804313)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1.0 | mg/kg | ----<br><1 | .2 mg/kg<br>---- | 99.1<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 88.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 804379) - Continued** | | | | | | | | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 94.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 92.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 111 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 100 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 77.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 795166)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 105 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 795166)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 115 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 795166)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 795166)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 108 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 795172)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.2 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.0 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.8 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 69 | 106 | ---- | ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 795172) - Continued** | | | | | | | | | | | |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.8 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.0 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 92.7 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.0 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.6 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.5 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 795172)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 88.6 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 799890)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 108 | ---- | 56 | 141 | ---- | ---- |

| Matrix: WATER | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 2 µg/L | 85.0 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 794584)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 71.4 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 795224)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 67.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 96.3 | ---- | 29 | 116 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 801216)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 70.3 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 73.8 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 88.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 98.1 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 100 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 92.2 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 801216)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | # 43.4 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 96.0 | ---- | 67 | 125 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 801216) - Continued** | | | | | | | | | | | |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 93.2 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 801216)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 90.9 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 98.4 | ---- | 77 | 120 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 801216)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 799892)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 85.3 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 88.9 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 77.1 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 82.2 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 83.2 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 81.0 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 86.9 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 86.3 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 83.8 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 84.6 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 799892)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 76.1 | ---- | 65 | 113 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 799893)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 105 | ---- | 67 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 804379)** | | | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 90.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 99.0 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 90.0 | ---- | 75 | 125 | ---- | ---- |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 804379) - Continued** | | | | | | | | | | |
| HK0818547-002 | Anonymous | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 805389)** | | | | | | | | | | |
| HK0818774-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 113 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799868)** | | | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C6 - C8 Fraction | ---- | 3 mg/kg | 76.6 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 799891)** | | | | | | | | | | |
| HK0818773-003 | 2108/XRL/EDH36 (4.5M-4.95M) | C9 - C16 Fraction | ---- | 31 mg/kg | 101 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 80.0 | ---- | 50 | 130 | ---- | ---- |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 800685)** | | | | | | | | | | |
| HK0818773-001 | 2108/XRL/EDH31 (WATER SAMPLE) | EG036: Mercury | 7439-97-6 | 2 µg/L | 80.0 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-075T: Base/Neutral Extractable Surrogates - Continued | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 20 | 137 |
| EP-066S: PCB Surrogate | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

| Sub-Matrix: WATER | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| EP-080S: TPH(Volatile)/BTEX Surrogate | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| EP-074S: VOC Surrogates | | | |
| Dibromofluoromethane | 1868-53-7 | 86 | 118 |
| Toluene-D8 | 2037-26-5 | 88 | 110 |
| 4-Bromofluorobenzene | 460-00-4 | 86 | 115 |
| EP-075S: Acid Extractable Surrogates | | | |
| 2-Fluorophenol | 367-12-4 | 21 | 100 |
| Phenol-d6 | 13127-88-3 | 20 | 94 |
| 2.4.6-Tribromophenol | 118-79-6 | 20 | 123 |
| EP-075T: Base/Neutral Extractable Surrogates | | | |
| Nitrobenzene -d5 | 4165-60-0 | 35 | 114 |
| 2-Fluorobiphenyl | 321-60-8 | 43 | 116 |
| 4-Terphenyl-d14 | 1718-51-0 | 33 | 141 |
| EP-066S: PCB Surrogate | | | |
| Decachlorobiphenyl | 2051-24-3 | 50 | 130 |

**Site S**

**(2108/XRL/EDHS-01 to 2108/XRL/EDHS-02)**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 13 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0900879 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
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| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 12-JAN-2009 |
| Order number | : ---- | | | Issue Date | : 03-FEB-2009 |
| C-O-C number | : H004322 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 4 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 24-JAN-2009

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: **HK0900879**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDHS01 (3M-3.45M) | 2108/XRL/EDHS01 (4.5M-4.95M) | 2108/XRL/EDHS01 (6.0M-6.45M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 12-JAN-2009 13:30 | 12-JAN-2009 14:30 | 12-JAN-2009 15:00 | | |
| | | | | HK0900879-001 | HK0900879-002 | HK0900879-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **14.3** | **14.7** | **13.8** | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **16** | **55** | **46** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **69** | **56** | **105** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **3** | **2** | **6** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **198** | **226** | **273** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **5** | **4** | **6** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDHS01 (3M-3.45M) | 2108/XRL/EDHS01 (4.5M-4.95M) | 2108/XRL/EDHS01 (6.0M-6.45M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 12-JAN-2009 13:30 | 12-JAN-2009 14:30 | 12-JAN-2009 15:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0900879-001 | HK0900879-002 | HK0900879-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **96.9** | **93.1** | **93.4** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **96.0** | **96.2** | **96.4** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **99.8** | **102** | **99.4** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **96.9** | **93.1** | **93.4** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **96.0** | **96.2** | **96.4** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **99.8** | **102** | **99.4** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | **59.2** | **65.9** | **69.8** | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | **48.8** | **56.0** | **55.9** | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | **64.1** | **72.7** | **66.3** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | **62.9** | **71.1** | **75.5** | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | **67.5** | **71.6** | **71.1** | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | **94.5** | **103** | **98.2** | | |

| Sub-Matrix: WATER | | | Client sample ID | 2108/XRL/EDHS01 (WATER SAMPLE) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 12-JAN-2009 15:45 | | | | |
| Compound | CAS Number | LOR | Unit | HK0900879-004 | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | **600** | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **2108/XRL/EDHS01 (WATER SAMPLE)** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 12-JAN-2009 15:45 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0900879-004** | | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | | <4 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **90.2** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **91.8** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **98.6** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **90.2** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **91.8** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **98.6** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **89.2** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **85.0** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **96.2** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **87.7** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **96.2** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **87.8** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 866596)** | | | | | | | | |
| HK0900793-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.4 | 12.4 | 8.3 |
| HK0900884-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.6 | 11.2 | 3.9 |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | |
| HK0900879-002 | 2108/XRL/EDHS01 (4.5M-4.95M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 55 | 59 | 7.8 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 59 | 3.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 2 | 2 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 226 | 232 | 2.7 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | |
| HK0900884-004 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 868045)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 868044) - Continued** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 96.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 92.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 112 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.3 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 89.6 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 70.6 | ---- | 45 | 122 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805) - Continued** | | | | | | | | | | | |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 72.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.5 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.7 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 89.8 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 88.3 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 86.7 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.1 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 96.6 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.0 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.4 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 85.2 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 83.8 | ---- | 59 | 142 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.2 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.3 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 68.8 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.7 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.4 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.4 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.0 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.9 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.5 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.7 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 85.4 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.9 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 68 | 111 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 66.8 | ---- | 61 | 105 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865808)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 80.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 87.4 | ---- | 29 | 116 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 868045)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 92.0 | ---- | 50 | 130 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 868044)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 102 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 92.2 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 99.5 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 104 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 94.8 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 102 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 868044)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 101 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 868044)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 89.2 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 103 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 868044)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 112 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 87.5 | ---- | 77 | 120 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865807)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 85.1 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 75.5 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 80.0 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 85.7 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 95.9 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 96.6 | ---- | 64 | 113 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | DCS | Recovery Limits (%): Low | High | RPD (%): Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865807) - Continued** | | | | | | | | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 89.4 | ---- | 62 | 116 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 105 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865807)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 79.5 | ---- | 65 | 113 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | MSD | Recovery Limits (%): Low | High | RPD (%): Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 84.5 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | |
| HK0900879-001 | 2108/XRL/EDHS01 (3M-3.45M) | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 88.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 82.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 94.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 89.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | |
| HK0900879-002 | 2108/XRL/EDHS01 (4.5M-4.95M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 94.2 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | |
| HK0900879-002 | 2108/XRL/EDHS01 (4.5M-4.95M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 80.3 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 64.3 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | MSD | Recovery Limits (%): Low | High | RPD (%): Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | | | |
| HK0900879-004 | 2108/XRL/EDHS01 (WATER SAMPLE) | **EG036: Mercury** | 7439-97-6 | 0.2 µg/L | 105 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Recovery Limits (%) |
|---|

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem HK Pty Ltd** | Page | : **1 of 7** |
| Contact | : **MR TOM LO** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0900882** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **tom@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **10-JAN-2008** |
| Order number | : **----** | | | Issue Date | : **03-FEB-2009** |
| C-O-C number | : **H004321** | | | No. of samples received | : **4** |
| Site | : **----** | | | 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 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: 24-JAN-2009

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: **HK0900882**

**Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.**

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

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDHS01 (0.5M-0.95M) | 2108/XRL/EDHS01 (1.5M-1.95M) | 2108/XRL/EDHS02 (0.5M-0.95M) | 2108/XRL/EDHS02 (1.5M-1.95M) |
|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 10-JAN-2009 10:00 | 10-JAN-2009 12:00 | 10-JAN-2009 14:00 | 10-JAN-2009 15:30 |
| | | | | HK0900882-001 | HK0900882-002 | HK0900882-003 | HK0900882-004 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **16.1** | **18.6** | **24.6** | **18.0** |
| **EG: Metals and Major Cations** | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | **0.4** | <0.2 | <0.2 | <0.2 |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **68** | **6** | **16** | **7** |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **66** | **47** | **59** | **49** |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **14** | **5** | **4** | **4** |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **444** | **115** | **118** | **83** |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **11** | **6** | **7** | **6** |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | <5.0 |
| **EP-075A: Phenols** | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDHS01 (0.5M-0.95M) | 2108/XRL/EDHS01 (1.5M-1.95M) | 2108/XRL/EDHS02 (0.5M-0.95M) | 2108/XRL/EDHS02 (1.5M-1.95M) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 10-JAN-2009 10:00 | 10-JAN-2009 12:00 | 10-JAN-2009 14:00 | 10-JAN-2009 15:30 | |
| Compound | CAS Number | LOR | Unit | | HK0900882-001 | HK0900882-002 | HK0900882-003 | HK0900882-004 | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **93.2** | **92.9** | **91.9** | **94.0** | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **97.3** | **97.6** | **96.3** | **96.4** | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **100** | **101** | **101** | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **93.2** | **92.9** | **91.9** | **94.0** | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **97.3** | **97.6** | **96.3** | **96.4** | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **100** | **101** | **101** | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **56.9** | **68.8** | **66.6** | **57.0** | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **49.8** | **55.2** | **60.7** | **47.9** | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **62.8** | **67.9** | **73.1** | **60.6** | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **63.7** | **72.6** | **69.4** | **63.2** | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **63.0** | **67.5** | **66.4** | **60.5** | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **93.7** | **96.9** | **93.5** | **90.3** | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 866596)** | | | | | | | | |
| HK0900793-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.4 | 12.4 | 8.3 |
| HK0900884-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.6 | 11.2 | 3.9 |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | |
| HK0900879-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 55 | 59 | 7.8 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 59 | 3.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 2 | 2 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 226 | 232 | 2.7 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | |
| HK0900879-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | |
| HK0900879-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804) - Continued** | | | | | | | | |
| HK0900879-001 | Anonymous | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 96.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 92.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 112 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.3 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 89.6 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 70.6 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 72.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | | | | |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802) - Continued** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.5 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.7 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 89.8 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 88.3 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 86.7 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.1 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 96.6 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.0 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.4 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 85.2 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 83.8 | ---- | 59 | 142 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.2 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.3 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 68.8 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.7 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.4 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.4 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.0 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.9 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.5 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.7 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 85.4 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.9 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 66.8 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | |
| HK0900879-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 84.5 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | |
| HK0900879-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 88.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 82.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 94.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 89.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | |
| HK0900879-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 94.2 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | |
| HK0900879-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 80.3 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 64.3 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%) | |
|---|---|---|---|
| | | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 13 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0900884 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 13-JAN-2009 |
| Order number | : ---- | | | Issue Date | : 03-FEB-2009 |
| C-O-C number | : H004323 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 4 |

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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** | **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: 24-JAN-2009

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: **HK0900884**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDHS02 (3M-3.45M) | 2108/XRL/EDHS02 (4.5M-4.95M) | 2108/XRL/EDHS02 (6.0M-6.45M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 13-JAN-2009 09:30 | 13-JAN-2009 10:30 | 13-JAN-2009 11:20 | | |
| | | | | HK0900884-001 | HK0900884-002 | HK0900884-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **11.6** | **19.5** | **9.7** | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | **0.2** | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **13** | **30** | **33** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **56** | **60** | **38** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **2** | **2** | **2** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **97** | **133** | **123** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **4** | **4** | **6** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDHS02 (3M-3.45M) | 2108/XRL/EDHS02 (4.5M-4.95M) | 2108/XRL/EDHS02 (6.0M-6.45M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-JAN-2009 09:30 | 13-JAN-2009 10:30 | 13-JAN-2009 11:20 | | |
| Compound | CAS Number | LOR | Unit | | HK0900884-001 | HK0900884-002 | HK0900884-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **92.6** | **92.4** | **98.4** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **97.0** | **96.8** | **98.0** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **100** | **100** | **99.7** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **92.6** | **92.4** | **98.4** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **97.0** | **96.8** | **98.0** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **100** | **100** | **99.7** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | **58.5** | **73.0** | **62.6** | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | **47.9** | **56.9** | **49.7** | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | **55.0** | **63.6** | **64.4** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | **64.4** | **78.5** | **69.0** | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | **61.8** | **68.7** | **69.4** | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | **90.3** | **101** | **102** | | |

| Sub-Matrix: WATER | | | Client sample ID | 2108/XRL/EDHS02 (WATER SAMPLE) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 13-JAN-2009 14:45 | | | | |
| Compound | CAS Number | LOR | Unit | HK0900884-004 | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | <500 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | <2 | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | <2 | | | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | <2 | | | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | <2 | | | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | <2 | | | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | <2 | | | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | <2 | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | | | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |

| Sub-Matrix: **WATER** | | | *Client sample ID* | **2108/XRL/EDHS02 (WATER SAMPLE)** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sampling date / time* | 13-JAN-2009 14:45 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0900884-004** | | | | |
| **EP-075G: Chlorinated Hydrocarbons - Continued** | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | <4 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **88.3** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **92.2** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **102** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **88.3** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **92.2** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **102** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **54.8** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **53.6** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **88.2** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | **69.3** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | **72.0** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | **99.4** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 866596)** | | | | | | | | |
| HK0900793-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.4 | 12.4 | 8.3 |
| HK0900884-001 | 2108/XRL/EDHS02 (3M-3.45M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.6 | 11.2 | 3.9 |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | |
| HK0900879-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 55 | 59 | 7.8 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 56 | 59 | 3.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 2 | 2 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 226 | 232 | 2.7 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | |
| HK0900879-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | |
| HK0900879-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | |
| HK0900879-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804) - Continued** | | | | | | | | |
| HK0900879-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | |
| HK0900879-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | |
| HK0900884-004 | 2108/XRL/EDHS02 (WATER SAMPLE) | **EG036: Mercury** | 7439-97-6 | 0.05 | µg/L | <0.05 | <0.05 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 868045)** | | | | | | | | |
| HK0900879-004 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 868044) - Continued** | | | | | | | | |
| HK0900879-004 | Anonymous | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 868044)** | | | | | | | | |
| HK0900879-004 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 96.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 92.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 112 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.3 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 89.6 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 70.6 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 72.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 865802)** | | | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.5 | ---- | 57 | 144 | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.7 | ---- | 66 | 128 | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 89.8 | ---- | 76 | 134 | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 88.3 | ---- | 69 | 142 | ---- | ---- |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 86.7 | ---- | 69 | 126 | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.1 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 865802)** | | | | | | | | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5<br>---- | ----<br>5.0 mg/kg | ----<br>96.6 | ----<br>---- | ----<br>16 | ----<br>138 | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802)** | | | | | | | | | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 87.0 | ---- | 65 | 134 | ---- | ---- |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 88.4 | ---- | 74 | 128 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074E: Halogenated Aliphatics (QC Lot: 865802) - Continued** | | | | | | | | | | | |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 865802)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 85.2 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 83.8 | ---- | 59 | 142 | ---- | ---- |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 865802)** | | | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 865804)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.2 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865804)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.3 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 68.8 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.7 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.4 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.4 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.0 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.9 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.5 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.7 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 85.4 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.9 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865804)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 66.8 | ---- | 61 | 105 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.05 | µg/L | <0.05 | 0.2 µg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865808)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 80.4 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 87.4 | ---- | 29 | 116 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 868045)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 92.0 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 868044)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 102 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 92.2 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 99.5 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 104 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 94.8 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 102 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 868044)** | | | | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 50 | µg/L | <50 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 101 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 868044)** | | | | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | µg/L | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 89.2 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 103 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 868044)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 112 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 87.5 | ---- | 77 | 120 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 865807)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 85.1 | ---- | 42 | 113 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 75.5 | ---- | 42 | 120 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 80.0 | ---- | 44 | 115 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 85.7 | ---- | 47 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 51 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 86.2 | ---- | 51 | 113 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 95.9 | ---- | 63 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 96.6 | ---- | 64 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 89.4 | ---- | 62 | 116 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 105 | ---- | 65 | 114 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 865807)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 79.5 | ---- | 65 | 113 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 866561)** | | | | | | | | | | |
| HK0900879-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 84.5 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 867959)** | | | | | | | | | | |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| HK0900879-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 88.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 82.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 94.9 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 89.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865803)** | | | | | | | | | | |
| HK0900879-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 94.2 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 865805)** | | | | | | | | | | |
| HK0900879-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 80.3 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 64.3 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 866560)** | | | | | | | | | | |
| HK0900879-004 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.2 µg/L | 105 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |

| Sub-Matrix: **SOIL** | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 20 | 137 |

| Sub-Matrix: **WATER** | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |

**Site Q**

**(2108/XRL/EDHQ-01 to 2108/XRL/EDHQ-05)**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 8 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902905 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 17-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 03-MAR-2009 |
| C-O-C number | : H004336 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 27-FEB-2009

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: **HK0902905**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q01 (0.50-1.40M) | 2108/XRL/EDH-Q01 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 17-FEB-2009 11:10 | 17-FEB-2009 14:00 | | | |
| | | | | HK0902905-001 | HK0902905-002 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **17.5** | **17.6** | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **9** | **8** | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **41** | **62** | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | **6** | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **62** | **77** | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **16** | **9** | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q01 (0.50-1.40M) | 2108/XRL/EDH-Q01 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 17-FEB-2009 11:10 | 17-FEB-2009 14:00 | | | |
| Compound | CAS Number | LOR | Unit | | HK0902905-001 | HK0902905-002 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **102** | **101** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **100** | **101** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **102** | **101** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **100** | **101** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **76.4** | **84.9** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **71.5** | **76.4** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **59.2** | **66.9** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **71.7** | **83.3** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **60.2** | **70.6** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **68.7** | **83.8** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 896210)** | | | | | | | | |
| HK0902808-001 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 0.2 | 0.2 | 0.0 |
| HK0902912-002 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 15.7 | 15.8 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | |
| HK0902753-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 8 | 10 | 15.8 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 88 | 75 | 15.5 |
| HK0902912-002 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 6 | 6 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 44 | 45 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 67 | 72 | 7.1 |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | |
| HK0902905-002 | 2108/XRL/EDH-Q01 (1.50-2.40M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0903023-003 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 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 |
|---|---|

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 86.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 93.1 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 106 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 122 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 85.3 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 105 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 895463)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.7 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.7 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 96.7 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 94.5 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 895463)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 106 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 895463)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 895463)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 111 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895465)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.1 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.1 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 78.5 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.0 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.8 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.2 | ---- | 58 | 111 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465) - Continued** | | | | | | | | | | | |
| **Anthracene** | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 53 | 109 | ---- | ---- |
| **Fluoranthene** | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 60 | 114 | ---- | ---- |
| **Pyrene** | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.3 | ---- | 59 | 113 | ---- | ---- |
| **Benz(a)anthracene** | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.7 | ---- | 52 | 113 | ---- | ---- |
| **Chrysene** | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.4 | ---- | 57 | 115 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 93.4 | ---- | 63 | 117 | ---- | ---- |
| **Benzo(a)pyrene** | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.6 | ---- | 51 | 111 | ---- | ---- |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.7 | ---- | 72 | 111 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.1 | ---- | 67 | 114 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.1 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895465)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 79.0 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | | | |
| HK0902753-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 77.4 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | |
| HK0902905-001 | 2108/XRL/EDH-Q01 (0.50-1.40M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 124 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | | | |
| HK0902905-002 | 2108/XRL/EDH-Q01 (1.50-2.40M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 110 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | | | |
| HK0902905-002 | 2108/XRL/EDH-Q01 (1.50-2.40M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 101 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 121 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| *Compound* | *CAS Number* | *Recovery Limits (%)* | |
|---|---|---|---|
| | | *Low* | *High* |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 8 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0903023 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 18-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 04-MAR-2009 |
| C-O-C number | : H004337 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

## 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: 27-FEB-2009

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: **HK0903023**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q01 (3.0-3.90M) | 2108/XRL/EDH-Q01 (4.95-5.85M) | 2108/XRL/EDH-Q01 (5.85-6.30M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 18-FEB-2009 10:10 | 18-FEB-2009 11:30 | 18-FEB-2009 13:30 | | |
| | | | | HK0903023-001 | HK0903023-002 | HK0903023-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **17.6** | **19.5** | **18.3** | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | **0.4** | **0.2** | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **14** | **41** | **24** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **71** | **74** | **98** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **6** | **6** | **6** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **158** | **264** | **240** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **9** | **8** | **10** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q01 (3.0-3.90M) | 2108/XRL/EDH-Q01 (4.95-5.85M) | 2108/XRL/EDH-Q01 (5.85-6.30M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 18-FEB-2009 10:10 | 18-FEB-2009 11:30 | 18-FEB-2009 13:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0903023-001 | HK0903023-002 | HK0903023-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **96.2** | **96.2** | **95.8** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **101** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **103** | **103** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **96.2** | **96.2** | **95.8** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **101** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **103** | **103** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **40.7** | **29.1** | **34.0** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **82.8** | **66.1** | **64.8** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **82.1** | **64.5** | **81.4** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **61.6** | **63.1** | **67.3** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **91.3** | **65.9** | **66.3** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **101** | **88.6** | **98.3** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 897749)** | | | | | | | | |
| HK0902967-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 29.5 | 29.0 | 1.6 |
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 14 | 15 | 8.3 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 71 | 80 | 11.4 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 6 | 6 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 158 | 169 | 6.8 |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | |
| HK0902905-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0903023-003 | 2108/XRL/EDH-Q01 (5.85-6.30M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 897908)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074G: Trihalomethanes (THM) (QC Lot: 897908) - Continued** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | 2108/XRL/EDH-Q01 (3.0-3.90M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 87.0 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 897722) - Continued** | | | | | | | | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 95.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 92.1 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 92.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 106 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.0 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 83.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 87.5 | ---- | 57 | 141 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 897908)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.5 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 101 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 897908)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 98.2 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 897908)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 897908)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 897903)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 71.8 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 897903)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.3 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.8 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.0 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.8 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.3 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.3 | ---- | 53 | 109 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 897903) - Continued** | | | | | | | | | | | |
| **Fluoranthene** | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.9 | ---- | 60 | 114 | ---- | ---- |
| **Pyrene** | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.4 | ---- | 59 | 113 | ---- | ---- |
| **Benz(a)anthracene** | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 71.4 | ---- | 52 | 113 | ---- | ---- |
| **Chrysene** | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 57 | 115 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 75.9 | ---- | 63 | 117 | ---- | ---- |
| **Benzo(a)pyrene** | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 63.8 | ---- | 51 | 111 | ---- | ---- |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 66.1 | ---- | 72 | 111 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.1 | ---- | 67 | 114 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.1 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 897903)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 69.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | | | |
| HK0902967-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 92.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 94.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | |
| HK0902905-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 124 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | | | |
| HK0903023-002 | 2108/XRL/EDH-Q01 (4.95-5.85M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 72.6 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 83.9 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | | | |
| HK0903023-002 | 2108/XRL/EDH-Q01 (4.95-5.85M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 95.9 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 8 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902747 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 12-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 02-MAR-2009 |
| C-O-C number | : H004332 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 27-FEB-2009

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: **HK0902747**

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

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

**Sediment sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q02 (0.50-1.40M) | 2108/XRL/EDH-Q02 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 12-FEB-2009 15:00 | 12-FEB-2009 16:00 | | | |
| | | | | HK0902747-001 | HK0902747-002 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **11.3** | **16.4** | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **8** | **7** | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **44** | **34** | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **8** | **5** | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **65** | **67** | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **15** | **8** | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | | | |

| Sub-Matrix: SOIL | | | Client sample ID | 2108/XRL/EDH-Q02 (0.50-1.40M) | 2108/XRL/EDH-Q02 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 12-FEB-2009 15:00 | 12-FEB-2009 16:00 | | | |
| Compound | CAS Number | LOR | Unit | HK0902747-001 | HK0902747-002 | | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | **0.9** | <0.5 | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | **0.8** | <0.5 | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | **1.1** | <1.0 | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | **0.7** | <0.5 | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | **0.6** | <0.5 | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | **0.6** | <0.5 | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | **0.7** | <0.5 | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **99.9** | **98.1** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **101** | **101** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **99.9** | **98.1** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **101** | **101** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **84.0** | **66.2** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **77.8** | **83.2** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **83.5** | **72.9** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | **82.2** | **62.6** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | **86.4** | **80.2** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | **72.8** | **71.2** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 893709)** | | | | | | | | |
| HK0902637-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 63.6 | 63.2 | 0.7 |
| HK0902753-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 14.7 | 15.0 | 1.8 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 897102)** | | | | | | | | |
| HK0902761-001 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | |
| HK0902747-002 | 2108/XRL/EDH-Q02 (1.50-2.40M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | |
| HK0902747-002 | 2108/XRL/EDH-Q02 (1.50-2.40M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 34 | 35 | 3.7 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 67 | 75 | 12.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909) - Continued** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | 0.9 | 0.9 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | 0.8 | 1.0 | 19.1 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | 0.7 | 0.6 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | 0.7 | 0.7 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | 1.1 | <1.0 | 9.7 |
| **EP-075C: Phthalate Esters (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 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 |
|---|---|

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 897102)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1.0 | mg/kg | ----<br><1 | 2 mg/kg<br>---- | 99.7<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 127 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 57.2 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 59.4 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.3 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 113<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.4 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 49 | 105 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541) - Continued** | | | | | | | | | | | |
| **Acenaphthene** | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 59 | 105 | ---- | ---- |
| **Fluorene** | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 62 | 106 | ---- | ---- |
| **Phenanthrene** | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.7 | ---- | 58 | 111 | ---- | ---- |
| **Anthracene** | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.1 | ---- | 53 | 109 | ---- | ---- |
| **Fluoranthene** | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 60 | 114 | ---- | ---- |
| **Pyrene** | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 59 | 113 | ---- | ---- |
| **Benz(a)anthracene** | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.2 | ---- | 52 | 113 | ---- | ---- |
| **Chrysene** | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.0 | ---- | 57 | 115 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 104 | ---- | 63 | 117 | ---- | ---- |
| **Benzo(a)pyrene** | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 51 | 111 | ---- | ---- |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 72 | 111 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 67 | 114 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 119 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | |
| HK0902747-001 | 2108/XRL/EDH-Q02 (0.50-1.40M) | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 96.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 96.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | |
| HK0902747-002 | 2108/XRL/EDH-Q02 (1.50-2.40M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 125 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542) - Continued** | | | | | | | | | | |
| HK0902747-002 | 2108/XRL/EDH-Q02 (1.50-2.40M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 86.0 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 119 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 8 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902761 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 14-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 02-MAR-2009 |
| C-O-C number | : H004334 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

## 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: 27-FEB-2009

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: **HK0902761**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q02 (3.00-3.90M) | 2108/XRL/EDH-Q02 (4.95-5.85M) | 2108/XRL/EDH-Q02 (5.85-6.20M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 14-FEB-2009 09:20 | 14-FEB-2009 10:20 | 14-FEB-2009 11:10 | | |
| | | | | HK0902761-001 | HK0902761-002 | HK0902761-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **10.5** | **14.5** | **16.7** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **16** | **17** | **12** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **37** | **89** | **95** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **3** | **4** | **4** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **131** | **180** | **141** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **6** | **12** | **3** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q02 (3.00-3.90M) | 2108/XRL/EDH-Q02 (4.95-5.85M) | 2108/XRL/EDH-Q02 (5.85-6.20M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 14-FEB-2009 09:20 | 14-FEB-2009 10:20 | 14-FEB-2009 11:10 | | |
| Compound | CAS Number | LOR | Unit | | HK0902761-001 | HK0902761-002 | HK0902761-003 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **98.9** | **101** | **99.2** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **100** | **100** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **98.9** | **101** | **99.2** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **100** | **100** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **56.2** | **47.3** | **44.3** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **72.4** | **68.8** | **62.7** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **52.0** | **59.4** | **52.6** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **58.2** | **59.7** | **47.2** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **65.9** | **68.5** | **55.9** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **57.4** | **57.9** | **57.3** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 893709)** | | | | | | | | |
| HK0902637-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 63.6 | 63.2 | 0.7 |
| HK0902753-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 14.7 | 15.0 | 1.8 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 897102)** | | | | | | | | |
| HK0902761-001 | 2108/XRL/EDH-Q02 (3.00-3.90M) | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 34 | 35 | 3.7 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 67 | 75 | 12.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | |
| HK0902747-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | |
| HK0902747-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 893909)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 893909) - Continued** | | | | | | | | |
| HK0902747-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | 0.9 | 0.9 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | 0.8 | 1.0 | 19.1 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | 0.7 | 0.6 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | 0.7 | 0.7 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | 1.1 | <1.0 | 9.7 |
| **EP-075C: Phthalate Esters (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 897102)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | 2 mg/kg<br>---- | 99.7<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 896203) - Continued** | | | | | | | | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 127 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 57.2 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 59.4 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.3 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 113 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.4 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.7 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.1 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.2 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.0 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 104 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 51 | 111 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541) - Continued** | | | | | | | | | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 72 | 111 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 67 | 114 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 119 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 96.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 96.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 125 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 86.0 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 119 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-074S: VOC Surrogates - Continued** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 7 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902748 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 12-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 27-FEB-2009 |
| C-O-C number | : H004231 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 27-FEB-2009

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: **HK0902748**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID | 2108/XRL/EDH-Q03 (0.5-1.40M) | 2108/XRL/EDH-Q03 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 12-FEB-2009 11:50 | 12-FEB-2009 13:10 | | | |
| | | | | | HK0902748-001 | HK0902748-002 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | | **15.1** | **16.3** | | | |
| **EG: Metals and Major Cations** | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | | <0.2 | <0.2 | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | | **4** | **6** | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | | **24** | **41** | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | | <0.2 | <0.2 | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | | **4** | **4** | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | | **42** | **66** | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | | **16** | **7** | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | | <1 | <1 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | | <5 | <5 | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | | <200 | <200 | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | | <500 | <500 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | | <1.0 | <1.0 | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | | <5 | <5 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | | <5 | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | | <5 | <5 | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q03 (0.5-1.40M) | 2108/XRL/EDH-Q03 (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 12-FEB-2009 11:50 | 12-FEB-2009 13:10 | | | |
| Compound | CAS Number | LOR | Unit | | HK0902748-001 | HK0902748-002 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **97.2** | **101** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.8** | **101** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **97.2** | **101** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **100** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.8** | **101** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **76.0** | **65.2** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **89.8** | **86.6** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **76.3** | **72.6** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **76.9** | **65.6** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **81.9** | **79.3** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **86.4** | **73.2** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 893709)** | | | | | | | | |
| HK0902637-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 63.6 | 63.2 | 0.7 |
| HK0902753-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 14.7 | 15.0 | 1.8 |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 34 | 35 | 3.7 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 67 | 75 | 12.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | |
| HK0902747-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | |
| HK0902747-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | 0.9 | 0.9 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | 0.8 | 1.0 | 19.1 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | 0.7 | 0.6 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | 0.7 | 0.7 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | 1.1 | <1.0 | 9.7 |
| **EP-075C: Phthalate Esters (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 127 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 57.2 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 59.4 | ---- | 50 | 111 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.3 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 113<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.4 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.7 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.1 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.2 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.0 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 104 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 119 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 96.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 96.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 125 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 86.0 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 119 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 7 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902751 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 13-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 02-MAR-2009 |
| C-O-C number | : H004333 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

## 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: 27-FEB-2009

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: **HK0902751**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q03 (3.0-3.90M) | 2108/XRL/EDH-Q03 (4.95-5.40M) | 2108/XRL/EDH-Q03 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 13-FEB-2009 10:20 | 13-FEB-2009 10:10 | 13-FEB-2009 14:45 | | |
| | | | | HK0902751-001 | HK0902751-002 | HK0902751-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **7.6** | **12.0** | **8.3** | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **11** | **23** | **5** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **49** | **67** | **48** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **4** | **4** | **2** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **142** | **166** | **72** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **16** | **12** | **9** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q03 (3.0-3.90M) | 2108/XRL/EDH-Q03 (4.95-5.40M) | 2108/XRL/EDH-Q03 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 13-FEB-2009 10:20 | 13-FEB-2009 10:10 | 13-FEB-2009 14:45 | | |
| Compound | CAS Number | LOR | Unit | | HK0902751-001 | HK0902751-002 | HK0902751-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **98.9** | **99.6** | **98.3** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **100** | **99.7** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **102** | **102** | **99.6** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **98.9** | **99.6** | **98.3** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **100** | **99.7** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **102** | **102** | **99.6** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | **76.5** | **70.4** | **60.0** | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | **87.0** | **87.8** | **84.0** | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | **80.2** | **75.4** | **69.0** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | **80.2** | **69.8** | **64.2** | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | **88.2** | **83.0** | **74.6** | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | **74.3** | **70.8** | **65.8** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 893709)** | | | | | | | | |
| HK0902637-003 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 63.6 | 63.2 | 0.7 |
| HK0902753-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 14.7 | 15.0 | 1.8 |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | |
| HK0902747-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 34 | 35 | 3.7 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 67 | 75 | 12.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | |
| HK0902747-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | |
| HK0902747-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 893909)** | | | | | | | | |
| HK0902747-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | 0.9 | 0.9 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | 0.8 | 1.0 | 19.1 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | 0.7 | 0.6 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | 0.6 | 0.6 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | 0.7 | 0.7 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | 1.1 | <1.0 | 9.7 |
| **EP-075C: Phthalate Esters (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | |
| HK0902747-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 95.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 91.6 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 127 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 57.2 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 59.4 | ---- | 50 | 111 | ---- | ---- |

Matrix: **SOIL**

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 893909)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.3 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.2 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.5 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 893909)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 113<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 893909)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 893909)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895541)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.4 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895541)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.7 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.1 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.2 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.0 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 104 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.2 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895541)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 893697)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 119 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 896203)** | | | | | | | | | | |
| HK0902747-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 96.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 96.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 893910)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 125 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895542)** | | | | | | | | | | |
| HK0902747-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 86.0 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 119 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 10 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0902912 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 17-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 05-MAR-2009 |
| C-O-C number | : H004335 | | | No. of samples received | : 6 |
| Site | : ---- | | | No. of samples analysed | : 6 |

## 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: 27-FEB-2009

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: **HK0902912**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: SOIL

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q04 (0.5-1.40M) | 2108/XRL/EDH-Q04 (1.50-2.40M) | 2108/XRL/EDH-Q04 (3.0-3.90M) | 2108/XRL/EDH-Q04 (4.95-5.85M) | 2108/XRL/EDH-Q04 (5.85-6.75M) |
|---|---|---|---|---|---|---|---|---|
| Client sampling date / time | | | | 17-FEB-2009 08:40 | 17-FEB-2009 09:35 | 17-FEB-2009 11:10 | 17-FEB-2009 14:10 | 17-FEB-2009 14:50 |
| | | | | HK0902912-001 | HK0902912-002 | HK0902912-003 | HK0902912-004 | HK0902912-005 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 14.0 | 15.7 | 17.7 | 19.4 | 15.5 |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 8 | 6 | 11 | 14 | 8 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 31 | 44 | 46 | 86 | 34 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 4 | 4 | 3 | 3 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 36 | 67 | 125 | 138 | 59 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 39 | 7 | 7 | 8 | 2 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 2630 | <500 | <500 | <500 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| **EP-075A: Phenols** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q04 (0.5-1.40M) | 2108/XRL/EDH-Q04 (1.50-2.40M) | 2108/XRL/EDH-Q04 (3.0-3.90M) | 2108/XRL/EDH-Q04 (4.95-5.85M) | 2108/XRL/EDH-Q04 (5.85-6.75M) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 17-FEB-2009 08:40 | 17-FEB-2009 09:35 | 17-FEB-2009 11:10 | 17-FEB-2009 14:10 | 17-FEB-2009 14:50 |
| Compound | CAS Number | LOR | Unit | | HK0902912-001 | HK0902912-002 | HK0902912-003 | HK0902912-004 | HK0902912-005 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | **2540** | <5.0 | **31.1** | <5.0 |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **99.5** | **99.7** | **101** | **103** | **98.5** |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **99.7** | **99.5** | **99.7** | **100** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.6** | **99.6** | **101** | **100** | **100** |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **99.5** | **99.7** | **101** | **103** | **98.5** |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **99.7** | **99.5** | **99.7** | **100** |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **99.6** | **99.6** | **101** | **100** | **100** |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **82.7** | **36.9** | **88.0** | **82.8** | **93.3** |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **95.0** | **41.1** | **78.8** | **78.1** | **87.0** |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **93.5** | **33.5** | **75.5** | **65.4** | **69.6** |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **88.3** | **38.4** | **87.9** | **80.1** | **96.0** |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **92.8** | **67.6** | **78.1** | **75.1** | **82.3** |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **103** | **35.8** | **94.8** | **81.8** | **93.1** |

| Sub-Matrix: SOIL | | | Client sample ID | 2108/XRL/EDH-Q04 (6.75-7.20M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 17-FEB-2009 15:40 | | | | |
| Compound | CAS Number | LOR | Unit | HK0902912-006 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | **25.1** | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | **5** | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | **56** | | | | |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | **9** | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | **76** | | | | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | **21** | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | | | | |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | | | | |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | | | | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | | |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | | | | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |
| **EP-075A: Phenols** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q04 (6.75-7.20M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 17-FEB-2009 15:40 | | | | |
| Compound | CAS Number | LOR | Unit | | HK0902912-006 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) - Continued** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **99.9** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.0** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **100** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **99.9** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.0** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **100** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **86.1** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **75.5** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **63.3** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **85.2** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **77.2** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **81.7** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 896210)** | | | | | | | | |
| HK0902808-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 0.2 | 0.2 | 0.0 |
| HK0902912-002 | 2108/XRL/EDH-Q04 (1.50-2.40M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 15.7 | 15.8 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | |
| HK0902753-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 5 | 4 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 8 | 10 | 15.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 88 | 75 | 15.5 |
| HK0902912-002 | 2108/XRL/EDH-Q04 (1.50-2.40M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 44 | 45 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 67 | 72 | 7.1 |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | |
| HK0902905-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0903023-003 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | |
| HK0902905-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | |
| HK0902905-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 895463) - Continued** | | | | | | | | |
| HK0902905-001 | Anonymous | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 895463)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895465)** | | | | | | | | |
| HK0902905-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 86.3 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 93.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 896254) - Continued** | | | | | | | | | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 93.1 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 106 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 122 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 85.3 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 105 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 895463)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.7 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.7 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 96.7 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 94.5 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.3 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 895463)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 106 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 895463)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 895463)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 111 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 895465)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.1 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.1 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 78.5 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.0 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.8 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.2 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.1 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.3 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.7 | ---- | 52 | 113 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 895465) - Continued** | | | | | | | | | | | |
| **Chrysene** | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.4 | ---- | 57 | 115 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 93.4 | ---- | 63 | 117 | ---- | ---- |
| **Benzo(a)pyrene** | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 88.6 | ---- | 51 | 111 | ---- | ---- |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.7 | ---- | 72 | 111 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.1 | ---- | 67 | 114 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.1 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 895465)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 79.0 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 896254)** | | | | | | | | | | |
| HK0902753-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 87.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 77.4 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | |
| HK0902905-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 124 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895464)** | | | | | | | | | | |
| HK0902905-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 110 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 895466)** | | | | | | | | | | |
| HK0902905-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 101 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 121 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate - Continued** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 7 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0903026 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 19-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 04-MAR-2009 |
| C-O-C number | : H004338 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 27-FEB-2009

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: **HK0903026**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q05E (0.50-1.40M) | 2108/XRL/EDH-Q05E (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 18-FEB-2009 13:50 | 18-FEB-2009 15:20 | | | |
| | | | | HK0903026-001 | HK0903026-002 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **17.8** | **16.6** | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **13** | **10** | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **57** | **55** | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | **5** | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **95** | **120** | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **32** | **7** | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | **1** | <1 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |

| Sub-Matrix: SOIL | | | Client sample ID | 2108/XRL/EDH-Q05E (0.50-1.40M) | 2108/XRL/EDH-Q05E (1.50-2.40M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 18-FEB-2009 13:50 | 18-FEB-2009 15:20 | | | |
| Compound | CAS Number | LOR | Unit | HK0903026-001 | HK0903026-002 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | **68.1** | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | **95.1** | **89.6** | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | **100** | **99.3** | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | **102** | **102** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | **95.1** | **89.6** | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | **100** | **99.3** | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | **102** | **102** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | **30.2** | **26.5** | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | **78.5** | **69.0** | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | **70.3** | **64.6** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | **60.5** | **57.8** | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | **70.4** | **67.5** | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | **75.2** | **61.1** | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 897749)** | | | | | | | | |
| HK0902967-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 29.5 | 29.0 | 1.6 |
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | |
| HK0903023-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 14 | 15 | 8.3 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 71 | 80 | 11.4 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 6 | 6 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 158 | 169 | 6.8 |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | |
| HK0902905-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0903023-003 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | |
| HK0903023-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | |
| HK0903023-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 897908)** | | | | | | | | |
| HK0903023-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 897903)** | | | | | | | | |
| HK0903023-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 87.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 95.8 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 92.1 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 92.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 106 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.0 | ---- | 45 | 122 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 83.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 87.5 | ---- | 57 | 141 | ---- | ---- |

Matrix: **SOIL**

| | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 897908)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.5 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 101 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 100 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 897908)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 98.2<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 897908)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 897908)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 897903)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 71.8 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 897903)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.3 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.8 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.0 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.8 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.3 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.3 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.9 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.4 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 71.4 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 57 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 75.9 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 63.8 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 66.1 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.1 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.1 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 897903)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 69.6 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: **SOIL**

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 897722)** | | | | | | | | | | |
| HK0902967-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 92.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 94.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 899244)** | | | | | | | | | | |
| HK0902905-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 124 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897904)** | | | | | | | | | | |
| HK0903023-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 72.6 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 83.9 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 897909)** | | | | | | | | | | |
| HK0903023-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 95.9 | ---- | 50 | 130 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 8 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0903275 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 19-FEB-2009 |
| Order number | : ---- | | | Issue Date | : 06-MAR-2009 |
| C-O-C number | : H004339 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 3 |

## 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: 27-FEB-2009

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: **HK0903275**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH-Q05E (3.0-3.90M) | 2108/XRL/EDH-Q05E (4.95-5.85M) | 2108/XRL/EDH-Q05E (5.85-6.75M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 19-FEB-2009 09:00 | 19-FEB-2009 10:20 | 19-FEB-2009 11:30 | | |
| | | | | HK0903275-001 | HK0903275-002 | HK0903275-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **21.5** | **9.0** | **11.3** | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **10** | **22** | **9** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **64** | **51** | **55** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | **4** | **2** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **155** | **489** | **203** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **10** | **9** | **16** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/EDH-Q05E (3.0-3.90M) | 2108/XRL/EDH-Q05E (4.95-5.85M) | 2108/XRL/EDH-Q05E (5.85-6.75M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 19-FEB-2009 09:00 | 19-FEB-2009 10:20 | 19-FEB-2009 11:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0903275-001 | HK0903275-002 | HK0903275-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | **356** | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.2** | **96.0** | **95.5** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **98.6** | **99.7** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **103** | **104** | **104** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **95.2** | **96.0** | **95.5** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **100** | **98.6** | **99.7** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **103** | **104** | **104** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **49.7** | **65.9** | **52.7** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **43.8** | **84.9** | **49.9** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **48.6** | **94.2** | **73.1** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **49.5** | **80.7** | **51.2** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **47.5** | **93.8** | **56.4** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **42.0** | **71.6** | **66.0** | | |

## Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 902020)** | | | | | | | | |
| HK0903275-001 | 2108/XRL/EDH-Q05E (3.0-3.90M) | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 21.5 | 21.6 | 0.5 |
| **EG: Metals and Major Cations (QC Lot: 900985)** | | | | | | | | |
| HK0902960-002 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| HK0903250-002 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 903418)** | | | | | | | | |
| HK0903275-002 | 2108/XRL/EDH-Q05E (4.95-5.85M) | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 22 | 25 | 9.8 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 51 | 60 | 17.0 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 489 | 408 | 18.1 |
| HK0903434-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | 0.3 | 0.3 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 10 | 10 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 33 | 31 | 5.2 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 3 | 2 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 144 | 131 | 9.7 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900842)** | | | | | | | | |
| HK0902960-001 | Anonymous | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900852)** | | | | | | | | |
| HK0902960-001 | Anonymous | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 900851)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 900851)** | | | | | | | | |
| HK0902960-001 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 900851)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 900851) - Continued** | | | | | | | | |
| HK0902960-001 | Anonymous | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 900851)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 900851)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 900841)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 900841)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 900841)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 900841)** | | | | | | | | |
| HK0902960-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 900985)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 103 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 903418)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 94.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 96.4 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 903418) - Continued** | | | | | | | | | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 90.2 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 91.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900842)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 88.3 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 95.2 | ---- | 50 | 111 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900852)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 91.4 | ---- | 57 | 141 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 900851)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 102 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.3 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.8 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.0 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.3 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 900851)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 113 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 900851)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 900851)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 900841)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 73.9 | ---- | 50 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 900841)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 69.7 | ---- | 58 | 102 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 75.6 | ---- | 49 | 105 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.6 | ---- | 59 | 105 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 62 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.8 | ---- | 58 | 111 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.8 | ---- | 53 | 109 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 78.8 | ---- | 60 | 114 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.8 | ---- | 59 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 52 | 113 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.8 | ---- | 57 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | LOR | Unit | Result | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 900841) - Continued** | | | | | | | | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 83.5 | ---- | 63 | 117 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.9 | ---- | 51 | 111 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 74.5 | ---- | 72 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.3 | ---- | 67 | 114 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.3 | ---- | 68 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 900841)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 81.9 | ---- | 61 | 105 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 900985)** | | | | | | | | | | |
| HK0902960-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 903418)** | | | | | | | | | | |
| HK0903275-001 | 2108/XRL/EDH-Q05E (3.0-3.90M) | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 79.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 114 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 83.8 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900842)** | | | | | | | | | | |
| HK0902960-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 78.6 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 105 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 900852)** | | | | | | | | | | |
| HK0902960-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 86.5 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SOIL

| Compound | CAS Number | Recovery Limits (%) | |
|---|---|---|---|
| | | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |

**Site M**

**(2108/XRL/EDHM01 to 2108/XRL/EDHM04)**

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 15 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905257 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 18-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 16-APR-2009 |
| C-O-C number | : H004742 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

## 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: 27-MAR-2009

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: **HK0905257**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M01 (0.50-1.40M) | 2108/XRL/M01 (1.50-2.40M) | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: [18-MAR-2009] | [18-MAR-2009] | [18-MAR-2009] | | |
| | | | | HK0905257-001 | HK0905257-002 | HK0905257-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **19.1** | **13.9** | **19.8** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **9** | **6** | **9** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **55** | **43** | **58** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **9** | **5** | **9** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **67** | **76** | **58** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **15** | **13** | **14** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M01 (0.50-1.40M) | 2108/XRL/M01 (1.50-2.40M) | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [18-MAR-2009] | [18-MAR-2009] | [18-MAR-2009] | | |
| Compound | CAS Number | LOR | Unit | | HK0905257-001 | HK0905257-002 | HK0905257-003 | | |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **96.7** | **99.8** | **97.4** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.7** | **98.8** | **105** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **99.5** | **101** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **96.7** | **99.8** | **97.4** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.7** | **98.8** | **105** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **101** | **99.5** | **101** | | |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M01 (0.50-1.40M)** | **2108/XRL/M01 (1.50-2.40M)** | **2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | [18-MAR-2009] | [18-MAR-2009] | [18-MAR-2009] | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905257-001** | **HK0905257-002** | **HK0905257-003** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **62.5** | **88.0** | **81.2** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **59.3** | **83.6** | **78.0** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **58.5** | **87.8** | **78.9** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **70.4** | **97.2** | **79.5** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **66.4** | **94.2** | **86.3** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **72.2** | **97.6** | **93.0** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **65.0** | **93.2** | **56.0** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **68.4** | **88.6** | **58.8** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M01 (0.50-1.40M)** | **2108/XRL/M01 (1.50-2.40M)** | **2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | [18-MAR-2009] | [18-MAR-2009] | [18-MAR-2009] | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905257-001** | **HK0905257-002** | **HK0905257-003** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 926756)** | | | | | | | | |
| HK0905167-001 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 13.4 | 12.7 | 5.4 |
| HK0905264-001 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 15.4 | 15.6 | 0.8 |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 939139)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 19.8 | 20.9 | 5.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 928467)** | | | | | | | | |
| HK0905257-002 | 2108/XRL/M01 (1.50-2.40M) | **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 941877)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | |
| HK0905066-006 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 69 | 70 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 34 | 37 | 7.1 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 8 | 6 | 19.3 |
| | | **EG020: Zinc** | 7440-66-6 | 20 | mg/kg | 88 | 71 | 20.7 |
| HK0905121-003 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 1 | 1 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 46 | 43 | 7.1 |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | |
| HK0905056-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| HK0905271-003 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 939049)** | | | | | | | | |
| HK0905884-011 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 0.01 | mg/kg | 0.06 | 0.05 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.02 | mg/kg | 0.08 | 0.09 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 0.05 | mg/kg | 11.1 | 11.6 | 4.8 |
| | | **EG020: Lead** | 7439-92-1 | 0.05 | mg/kg | 23.3 | 24.4 | 4.9 |
| | | **EG020: Nickel** | 7440-02-0 | 0.05 | mg/kg | 7.12 | 7.19 | 1.0 |
| | | **EG020: Zinc** | 7440-66-6 | 0.5 | mg/kg | 44.2 | 44.0 | 0.6 |
| **EG: Metals and Major Cations (QC Lot: 939721)** | | | | | | | | |
| HK0905848-002 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286) - Continued** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 939239)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 939592)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 939238)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 939238)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285)** | | | | | | | | |

Matrix: **SOIL**

| | | | | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| *Laboratory sample ID* | *Client sample ID* | *Method: Compound* | *CAS Number* | *LOR* | *Unit* | *Original Result* | *Duplicate Result* | *RPD (%)* |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285) - Continued** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 939238)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 939238)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 939238)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075A: Phenols (QC Lot: 939591)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288) - Continued** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 939591)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 939591)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 939591)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 926287)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-066: Polychlorinated Biphenyls (QC Lot: 939590)** | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 932196)** | | | | | | | | |
| HK0905257-001 | 2108/XRL/M01 (0.50-1.40M) | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 928467)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ---- | 10 mg/kg | 94.0 | ---- | 85 | 115 | ---- | ---- |
| | | | | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 941877)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 2 mg/kg | 94.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 90.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.3 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 109 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 89.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 939049)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 100 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 98.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 96.1 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.1 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 939721)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 40 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286) - Continued** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 101 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 88.4 | ---- | 31 | 119 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 73.7 | ---- | 33 | 127 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 939239)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 84.5 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 939592)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 57.1 | ---- | 28 | 132 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 47.7 | ---- | 27 | 143 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 926285)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 119 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 120 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 119 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 117 | ---- | 72 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 939238)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 127 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 124 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 138 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 121 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 134 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 926285)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 93.3<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 939238)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 132<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 121 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 127 | ---- | 74 | 128 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 939238)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 119 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 128 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 926285)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 59 | 142 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 939238)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 926288)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.3 | ---- | 49 | 119 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 939591)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 68.3 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.8 | ---- | 63 | 109 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.5 | ---- | 56 | 114 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.4 | ---- | 70 | 110 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.9 | ---- | 68 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 68 | 114 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.4 | ---- | 70 | 108 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 68 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.9 | ---- | 70 | 111 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 65 | 114 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.5 | ---- | 69 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 88.1 | ---- | 69 | 121 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.1 | ---- | 62 | 113 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.6 | ---- | 66 | 114 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 71 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.7 | ---- | 66 | 111 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 939591)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.5 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.5 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.6 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.1 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.6 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.1 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.5 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 93.1 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.9 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 84.8 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.7 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.6 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.7 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 63 | 104 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 926288)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 60 | 119 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 939591)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 88.2 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 926287)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 109 | ---- | 71 | 138 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 939590)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 118 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 932196)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.02 mg/L | 96.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 943214)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.002 mg/L | 92.5 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | | | |
| HK0905066-003 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 87.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 76.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 90.3 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | | | |
| HK0905052-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 40 mg/kg | 112 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 939049)** | | | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 88.0 | ---- | 75 | 125 | ---- | ---- |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 939049) - Continued** | | | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 122 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 939721)** | | | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 105 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | | | |
| HK0905257-002 | 2108/XRL/M01 (1.50-2.40M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | | | |
| HK0905257-002 | 2108/XRL/M01 (1.50-2.40M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 96.7 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 74.7 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 932196)** | | | | | | | | | | |
| HK0905045-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 100 | 99.4 | 75 | 125 | 1.2 | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 943214)** | | | | | | | | | | |
| HK0905257-003 | 2108/XRL/M01 DUPLICATE SAMPLE (0.5-1.4M) | **EG020: Mercury** | 7439-97-6 | 0.002 mg/L | 90.0 | 90.0 | 75 | 125 | 0.0 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 25 | 121 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 14 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905733 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 20-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 16-APR-2009 |
| C-O-C number | : H004743, H004577 | | | No. of samples received | : 4 |
| Site | : ---- | | | No. of samples analysed | : 4 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 31-MAR-2009

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: **HK0905733**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M01 (3.00-3.90M) | 2108/XRL/M01 (4.50-5.40M) | 2108/XRL/M01 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 20-MAR-2009 10:30 | 20-MAR-2009 11:20 | 20-MAR-2009 13:50 | | |
| | | | | HK0905733-001 | HK0905733-002 | HK0905733-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **17.5** | **15.3** | **27.7** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **50** | **12** | **7** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **42** | **58** | **70** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **7** | **4** | **3** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **227** | **106** | **69** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **14** | **20** | **2** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M01 (3.00-3.90M) | 2108/XRL/M01 (4.50-5.40M) | 2108/XRL/M01 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 20-MAR-2009 10:30 | 20-MAR-2009 11:20 | 20-MAR-2009 13:50 | | |
| Compound | CAS Number | LOR | Unit | | HK0905733-001 | HK0905733-002 | HK0905733-003 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **89.9** | **89.2** | **91.9** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **101** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **103** | **106** | **105** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **89.9** | **89.2** | **91.9** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **101** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **103** | **106** | **105** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **76.7** | **64.1** | **67.1** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **82.9** | **72.3** | **68.8** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **91.3** | **73.4** | **69.2** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M01 (3.00-3.90M)** | **2108/XRL/M01 (4.50-5.40M)** | **2108/XRL/M01 (6.00-6.90M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 20-MAR-2009 10:30 | 20-MAR-2009 11:20 | 20-MAR-2009 13:50 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905733-001** | **HK0905733-002** | **HK0905733-003** | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **77.3** | **72.0** | **69.6** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **89.7** | **79.8** | **78.2** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **97.7** | **105** | **103** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **72.4** | **67.6** | **65.6** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **84.8** | **82.6** | **82.2** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sample ID* | **2108/XRL/M01 (3.00-3.90M)** | **2108/XRL/M01 (4.50-5.40M)** | **2108/XRL/M01 (6.00-6.90M)** | | |
| | | | *Client sampling date / time* | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 14-APR-2009 12:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0905733-001** | **HK0905733-002** | **HK0905733-003** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | <0.2 | | |
| **Sample Preparation Method** | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | **1** | **1** | **1** | | |

| Sub-Matrix: WATER | | | Client sample ID | TRIP BLANK | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | [20-MAR-2009] | | | | |
| Compound | CAS Number | LOR | Unit | HK0905733-004 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **107** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **99.6** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **99.9** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **107** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **99.6** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **99.9** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 933611)** | | | | | | | | |
| HK0905731-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 19.3 | 19.3 | 0.0 |
| HK0905735-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 21.1 | 21.2 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | |
| HK0905731-001 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 35 | 38 | 7.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 75 | 72 | 5.1 |
| HK0905735-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 14 | 14.9 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 53 | 58 | 9.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 60 | 62 | 3.0 |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0905735-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | |
| HK0905731-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | |
| HK0905731-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859) - Continued** | | | | | | | | |
| HK0905731-001 | Anonymous | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | |
| HK0905731-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| HK0905735-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | |
| HK0905352-002 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | 6 | 5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .1859 mg/kg<br>---- | 99.6<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 95.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 87.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 87.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 95.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 88.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.2 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 70.3 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866) - Continued** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.4 | ---- | 31 | 119 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 58.8 | ---- | 33 | 127 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 129 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 88.9 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.6 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.0 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.4 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.0 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 86.4 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.7 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 94.2 | ---- | 67 | 106 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 74.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 93.9 | ---- | 60 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 85.7 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 83.0 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 87.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 87.0 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 96.6 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 86.6 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 94.4 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 83.4 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 99.8 | ---- | 77 | 120 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.5 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 91.1 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 91.2 | ---- | 75 | 125 | ---- | ---- |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 933638) - Continued** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 103 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 87.8 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 65.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.3 | 93.1 | 75 | 125 | 0.2 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |

| Sub-Matrix: **SOIL** | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-066S: PCB Surrogate - Continued** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

| Sub-Matrix: **WATER** | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 12 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905731 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 20-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 16-APR-2009 |
| C-O-C number | : H004743 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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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** | **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: 31-MAR-2009

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: **HK0905731**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M02 (0.50-1.40M) | 2108/XRL/M02 (1.50-2.40M) | 2108/XRL/M02 (1.50-2.40M) - DUPLICATE | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 20-MAR-2009 14:30 | 20-MAR-2009 15:20 | 20-MAR-2009 14:30 | | |
| | | | | HK0905731-001 | HK0905731-002 | HK0905731-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **19.3** | **13.2** | **19.4** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **9** | **7** | **10** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **51** | **35** | **51** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **9** | **6** | **8** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **72** | **75** | **66** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **12** | **15** | **12** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M02 (0.50-1.40M) | 2108/XRL/M02 (1.50-2.40M) | 2108/XRL/M02 (1.50-2.40M) - DUPLICATE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 20-MAR-2009 14:30 | 20-MAR-2009 15:20 | 20-MAR-2009 14:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0905731-001 | HK0905731-002 | HK0905731-003 | | |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **91.1** | **91.8** | **91.0** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **105** | **107** | **101** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **105** | **104** | **105** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **91.1** | **91.8** | **91.0** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **105** | **107** | **101** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **105** | **104** | **105** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **64.1** | **66.6** | **59.2** | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M02 (0.50-1.40M) | 2108/XRL/M02 (1.50-2.40M) | 2108/XRL/M02 (1.50-2.40M) - DUPLICATE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 20-MAR-2009 14:30 | 20-MAR-2009 15:20 | 20-MAR-2009 14:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0905731-001 | HK0905731-002 | HK0905731-003 | | |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **70.7** | **72.4** | **61.3** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **82.7** | **84.4** | **71.0** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **65.6** | **65.8** | **58.1** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **77.3** | **76.9** | **66.5** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **98.1** | **89.9** | **82.7** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **63.4** | **64.6** | **53.4** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **76.6** | **77.4** | **63.8** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M02 (0.50-1.40M)** | **2108/XRL/M02 (1.50-2.40M)** | **2108/XRL/M02 (1.50-2.40M) - DUPLICATE** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 18-MAR-2009 12:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905731-001** | **HK0905731-002** | **HK0905731-003** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 933611)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 19.3 | 19.3 | 0.0 |
| HK0905735-001 | Anonymous | **EA055: Moisture Content (dried @ 103°C)** | ---- | 0.1 | % | 21.1 | 21.2 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | |
| HK0905731-002 | 2108/XRL/M02 (1.50-2.40M) | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 35 | 38 | 7.8 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 75 | 72 | 5.1 |
| HK0905735-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 1 | mg/kg | 12 | 14 | 14.9 |
| | | **EG020: Lead** | 7439-92-1 | 1 | mg/kg | 53 | 58 | 9.1 |
| | | **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | 60 | 62 | 3.0 |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | |
| HK0905731-002 | 2108/XRL/M02 (1.50-2.40M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0905735-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859) - Continued** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 932865)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075C: Phthalate Esters (QC Lot: 932865) - Continued** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | |
| HK0905731-003 | 2108/XRL/M02 (1.50-2.40M) - DUPLICATE | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | |
| HK0905731-002 | 2108/XRL/M02 (1.50-2.40M) | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| HK0905735-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .1859 mg/kg<br>---- | 99.6<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 95.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 87.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 87.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 95.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 88.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.2 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 70.3 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.4 | ---- | 31 | 119 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866) - Continued** | | | | | | | | | | | |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 58.8 | ---- | 33 | 127 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 129 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 88.9 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.6 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.0 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.4 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.0 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 86.4 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.7 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 94.2 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864) - Continued** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 74.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.002 mg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 93.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 91.1 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 91.2 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | EG3060: Hexavalent Chromium | 18540-29-9 | 40 mg/kg | 103 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | |
| HK0905731-002 | 2108/XRL/M02 (1.50-2.40M) | C6 - C8 Fraction | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | |
| HK0905731-002 | 2108/XRL/M02 (1.50-2.40M) | C9 - C16 Fraction | ---- | 31 mg/kg | 87.8 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 65.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | | | |
| HK0905352-003 | Anonymous | EG020: Mercury | 7439-97-6 | 0.002 mg/L | 96.5 | 99.0 | 75 | 125 | 2.6 | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | |
| HK0905731-001 | 2108/XRL/M02 (0.50-1.40M) | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.3 | 93.1 | 75 | 125 | 0.2 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 18 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905756 |
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| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 23-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 20-APR-2009 |
| C-O-C number | : H004745-H004746 | | | No. of samples received | : 6 |
| Site | : ---- | | | No. of samples analysed | : 6 |

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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** | **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: 30-MAR-2009

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: **HK0905756**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M02 (3.00-3.90M) | 2108/XRL/M02 (4.50-5.40M) | 2108/XRL/M02 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 23-MAR-2009 10:30 | 23-MAR-2009 13:10 | 23-MAR-2009 14:00 | | |
| | | | | HK0905756-004 | HK0905756-005 | HK0905756-006 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **15.0** | **15.4** | **28.0** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **14** | **12** | **19** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **59** | **161** | **92** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **6** | **3** | **4** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **196** | **168** | **212** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **15** | **9** | **4** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M02 (3.00-3.90M) | 2108/XRL/M02 (4.50-5.40M) | 2108/XRL/M02 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 23-MAR-2009 10:30 | 23-MAR-2009 13:10 | 23-MAR-2009 14:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0905756-004 | HK0905756-005 | HK0905756-006 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.3** | **92.0** | **93.1** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **107** | **100** | **101** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **104** | **103** | **105** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.3** | **92.0** | **93.1** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **107** | **100** | **101** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **104** | **103** | **105** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **54.1** | **85.5** | **71.1** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **53.0** | **89.9** | **59.6** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **80.1** | **75.2** | **67.5** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M02 (3.00-3.90M) | 2108/XRL/M02 (4.50-5.40M) | 2108/XRL/M02 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 23-MAR-2009 10:30 | 23-MAR-2009 13:10 | 23-MAR-2009 14:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0905756-004 | HK0905756-005 | HK0905756-006 | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **57.9** | **78.5** | **64.9** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **67.6** | **94.0** | **70.2** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **99.4** | **85.6** | **85.0** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **59.6** | **72.0** | **52.4** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **74.6** | **87.4** | **59.8** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M02 (3.00-3.90M)** | **2108/XRL/M02 (4.50-5.40M)** | **2108/XRL/M02 (6.00-6.90M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 23-MAR-2009 12:00 | 23-MAR-2009 12:00 | 23-MAR-2009 12:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905756-004** | **HK0905756-005** | **HK0905756-006** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | | |

| Sub-Matrix: WATER | | | | Client sample ID | TRIP BLANK | FIELD BLANK | EQUIPMENT BLANK | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [23-MAR-2009] | [23-MAR-2009] | [23-MAR-2009] | | |
| Compound | CAS Number | LOR | Unit | | HK0905756-001 | HK0905756-002 | HK0905756-003 | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | | |
| **EK025MD: Free Cyanide** | ---- | 0.01 | mg/L | | ---- | <0.01 | <0.01 | | |
| **EG: Metals and Major Cations** | | | | | | | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 0.02 | mg/L | | ---- | <0.02 | <0.02 | | |
| **EG050: Hexavalent Chromium** | 18540-29-9 | 0.02 | mg/L | | ---- | <0.02 | <0.02 | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.0002 | mg/L | | ---- | <0.0002 | <0.0002 | | |
| **EG020: Copper** | 7440-50-8 | 0.001 | mg/L | | ---- | <0.001 | <0.001 | | |
| **EG020: Lead** | 7439-92-1 | 0.001 | mg/L | | ---- | <0.001 | **0.001** | | |
| **EG020: Mercury** | 7439-97-6 | 0.0001 | mg/L | | ---- | <0.0001 | <0.0001 | | |
| **EG020: Nickel** | 7440-02-0 | 0.001 | mg/L | | ---- | <0.001 | <0.001 | | |
| **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | | ---- | <0.01 | **0.57** | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | | <20 | <20 | <20 | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | | ---- | <500 | <500 | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | | ---- | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Toluene** | 108-88-3 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 | <10 | | |
| **Styrene** | 100-42-5 | 5 | µg/L | | <5 | <5 | <5 | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | | <50 | <50 | <50 | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | | <50 | <50 | <50 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | | <50 | <50 | <50 | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 2 | µg/L | | ---- | <2 | <2 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | | ---- | <2 | <2 | | |

| Sub-Matrix: WATER | | | | Client sample ID | TRIP BLANK | FIELD BLANK | EQUIPMENT BLANK | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [23-MAR-2009] | [23-MAR-2009] | [23-MAR-2009] | | |
| Compound | CAS Number | LOR | Unit | | HK0905756-001 | HK0905756-002 | HK0905756-003 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) - Continued** | | | | | | | | | |
| **Acenaphthylene** | 208-96-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Acenaphthene** | 83-32-9 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Fluorene** | 86-73-7 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Phenanthrene** | 85-01-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Anthracene** | 120-12-7 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Fluoranthene** | 206-44-0 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Benz(a)anthracene** | 56-55-3 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Chrysene** | 218-01-9 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | | ---- | <4 | <4 | | |
| **Benzo(a)pyrene** | 50-32-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 2 | µg/L | | ---- | <2 | <2 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 2 | µg/L | | ---- | <2 | <2 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 20 | µg/L | | ---- | <20 | <20 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | | ---- | <4 | <4 | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.01 | µg/L | | ---- | <0.01 | <0.01 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **106** | **104** | **106** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.9** | **99.1** | **102** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **102** | **101** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **106** | **104** | **106** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.9** | **99.1** | **102** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **102** | **101** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | ---- | **37.8** | **38.8** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | ---- | **25.5** | **21.0** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | ---- | **55.0** | **52.9** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | ---- | **53.4** | **38.9** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | ---- | **53.0** | **45.7** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | ---- | **104** | **94.9** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **TRIP BLANK** | **FIELD BLANK** | **EQUIPMENT BLANK** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | [23-MAR-2009] | [23-MAR-2009] | [23-MAR-2009] | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905756-001** | **HK0905756-002** | **HK0905756-003** | | |
| **EP-066S: PCB Surrogate - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | ---- | **87.8** | **96.8** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 935138)** | | | | | | | | |
| HK0905714-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 46.2 | 46.3 | 0.2 |
| HK0905806-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.8 | 10.8 | 9.2 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | |
| HK0905734-002 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 935190)** | | | | | | | | |
| HK0905756-005 | 2108/XRL/M02 (4.50-5.40M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0905847-003 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | |
| HK0905751-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 16 | 15 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 10 | 9 | 11.3 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 64 | 68 | 7.4 |
| HK0905802-005 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.01 | mg/kg | 0.13 | 0.13 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.02 | mg/kg | 0.05 | 0.05 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 0.05 | mg/kg | 18.8 | 21.1 | 11.9 |
| | | EG020: Lead | 7439-92-1 | 0.05 | mg/kg | 30.0 | 27.0 | 10.6 |
| | | EG020: Nickel | 7440-02-0 | 0.05 | mg/kg | 3.72 | 3.75 | 0.7 |
| | | EG020: Zinc | 7440-66-6 | 0.5 | mg/kg | 247 | 292 | 16.8 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 935783)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074B: Oxygenated Compounds (QC Lot: 935783) - Continued** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 935801)** | | | | | | | | |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 935801) - Continued** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 935800)** | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | |
| HK0905352-003 | Anonymous | **EK025MD: Free Cyanide** | ---- | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | |
| HK0905756-003 | EQUIPMENT BLANK | **EG050: Hexavalent Chromium** | 18540-29-9 | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | |
| HK0905447-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.0005 | mg/L | <0.0005 | <0.0005 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.002 | mg/L | <0.002 | <0.002 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | 0.06 | 0.06 | 0.0 |
| HK0905819-005 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.0001 | mg/L | <0.0001 | <0.0001 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.0002 | mg/L | <0.0002 | <0.0002 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 942719)** | | | | | | | | |
| HK0905756-005 | 2108/XRL/M02 (4.50-5.40M) | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | |
| HK0905352-002 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | 6 | 5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | 10 mg/kg<br>---- | 98.0<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 935190)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 40 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 93.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 96.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 66.1 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 56.4 | ---- | 28 | 132 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 55.0 | ---- | 27 | 143 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 935783)** | | | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 57 | 144 | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 121 | ---- | 66 | 128 | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 76 | 134 | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 133 | ---- | 69 | 142 | ---- | ---- |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 69 | 126 | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 131 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 935783)** | | | | | | | | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 105 | ---- | 16 | 138 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074B: Oxygenated Compounds (QC Lot: 935783) - Continued** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 935783)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 117 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 935783)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.6 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 935801)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 935801)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.4 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.9 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.7 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.7 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.8 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 102 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.3 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.4 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.8 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 935801)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 92.8 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 935800)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 91.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | | | | |
| EK025MD: Free Cyanide | ---- | 0.01 | mg/L | <0.01 | 0.2 mg/L | 106 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | | | | |
| EG050: Hexavalent Chromium | 18540-29-9 | 0.02 | mg/L | <0.02 | 0.5 mg/L | 97.8 | ---- | 85 | 115 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.0002 | mg/L | <0.0002 | 0.1 mg/L | 87.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 90.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 93.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.002 mg/L | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 91.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 0.01 | mg/L | <0.01 | 0.1 mg/L | 90.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 942719)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 92.9 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934349)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 66.0 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 71.1 | ---- | 29 | 116 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 93.9 | ---- | 60 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 85.7 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 83.0 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 87.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 87.0 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 96.6 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 86.6 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 94.4 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 83.4 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 99.8 | ---- | 77 | 120 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 934347)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 2 | µg/L | <2 | 5 µg/L | 45.0 | ---- | 9 | 85 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 934347)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 75.7 | ---- | 67 | 100 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 70.3 | ---- | 64 | 100 | ---- | ---- |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 74.8 | ---- | 53 | 102 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 80.9 | ---- | 63 | 103 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 91.7 | ---- | 65 | 102 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 92.6 | ---- | 62 | 102 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 99.3 | ---- | 74 | 107 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 934347) - Continued** | | | | | | | | | | | |
| **Pyrene** | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.1 | ---- | 74 | 108 | ---- | ---- |
| **Benz(a)anthracene** | 56-55-3 | 2 | µg/L | <2 | 5 µg/L | 88.8 | ---- | 55 | 122 | ---- | ---- |
| **Chrysene** | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 98.2 | ---- | 64 | 115 | ---- | ---- |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 106 | ---- | 70 | 112 | ---- | ---- |
| **Benzo(a)pyrene** | 50-32-8 | 2 | µg/L | <2 | 5 µg/L | 99.4 | ---- | 64 | 105 | ---- | ---- |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 2 | µg/L | <2 | 5 µg/L | 83.0 | ---- | 77 | 106 | ---- | ---- |
| **Dibenz(a.h)anthracene** | 53-70-3 | 2 | µg/L | <2 | 5 µg/L | 83.2 | ---- | 72 | 109 | ---- | ---- |
| **Benzo(g.h.i)perylene** | 191-24-2 | 2 | µg/L | <2 | 5 µg/L | 87.9 | ---- | 73 | 109 | ---- | ---- |
| **EP-075C: Phthalate Esters (QC Lot: 934347)** | | | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 20 | µg/L | <20 | 5 µg/L | 97.8 | ---- | 79 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 934347)** | | | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 81.8 | ---- | 66 | 107 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 934348)** | | | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 124 | ---- | 59 | 149 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 935190)** | | | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | | | |
| HK0905751-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 84.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | 84.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 82.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | | | |
| HK0905756-005 | 2108/XRL/M02 (4.50-5.40M) | **C6 - C8 Fraction** | ---- | 3 mg/kg | 73.5 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | | | |
| HK0905756-005 | 2108/XRL/M02 (4.50-5.40M) | **C9 - C16 Fraction** | ---- | 31 mg/kg | 71.6 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 64.1 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

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

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | | | |
| HK0905352-001 | Anonymous | **EK025MD: Free Cyanide** | ---- | 0.2 mg/L | 106 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | | | |
| HK0905756-002 | FIELD BLANK | **EG050: Hexavalent Chromium** | 18540-29-9 | 0.5 mg/L | 91.6 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | | | |
| HK0905352-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 0.1 mg/L | 97.4 | 91.8 | 75 | 125 | 5.9 | ---- |
| | | **EG020: Copper** | 7440-50-8 | 0.1 mg/L | 96.4 | 91.5 | 75 | 125 | 5.2 | ---- |
| | | **EG020: Lead** | 7439-92-1 | 0.1 mg/L | 86.2 | 89.6 | 75 | 125 | 4.0 | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.002 mg/L | 99.5 | 105 | 75 | 125 | 5.4 | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 0.1 mg/L | 93.9 | 92.4 | 75 | 125 | 1.6 | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 0.1 mg/L | 92.0 | 97.2 | 75 | 125 | 5.6 | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 942719)** | | | | | | | | | | |
| HK0905756-004 | 2108/XRL/M02 (3.00-3.90M) | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.7 | 107 | 75 | 125 | 13.4 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |
| **EP-066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 14 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905734 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 21-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 16-APR-2009 |
| C-O-C number | : H004744, H004577 | | | No. of samples received | : 5 |
| Site | : ---- | | | No. of samples analysed | : 5 |

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **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: 31-MAR-2009

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: **HK0905734**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M03 (3.00-3.90M) | 2108/XRL/M03 (4.50-5.40M) | 2108/XRL/M03 (6.00-6.90M) | 2108/XRL/M03 (3.00-3.45M) - DUPLICATE |
|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-MAR-2009 10:00 | 21-MAR-2009 10:50 | 21-MAR-2009 11:30 | 21-MAR-2009 10:00 |
| | | | | HK0905734-001 | HK0905734-002 | HK0905734-003 | HK0905734-004 |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **15.4** | **9.3** | **16.7** | **17.2** |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | <1 |
| **EG: Metals and Major Cations** | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **7** | **2** | **15** | **6** |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **141** | **11** | **76** | **78** |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **3** | **2** | **2** | **3** |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **108** | **18** | **84** | **74** |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **3** | **1** | **3** | **4** |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | <200 |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | <500 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | <5 |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M03 (3.00-3.90M) | 2108/XRL/M03 (4.50-5.40M) | 2108/XRL/M03 (6.00-6.90M) | 2108/XRL/M03 (3.00-3.45M) - DUPLICATE | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-MAR-2009 10:00 | 21-MAR-2009 10:50 | 21-MAR-2009 11:30 | 21-MAR-2009 10:00 | |
| Compound | CAS Number | LOR | Unit | | HK0905734-001 | HK0905734-002 | HK0905734-003 | HK0905734-004 | |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | |
| **EP-075A: Phenols** | | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | <0.5 | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | <5.0 | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | <0.2 | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | <0.1 | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **91.6** | **92.6** | **91.1** | **93.4** | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **101** | **104** | **100** | **107** | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **106** | **105** | **104** | **104** | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **91.6** | **92.6** | **91.1** | **93.4** | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **101** | **104** | **100** | **107** | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **106** | **105** | **104** | **104** | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | **64.6** | **64.6** | **67.3** | **72.4** | |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M03 (3.00-3.90M)** | **2108/XRL/M03 (4.50-5.40M)** | **2108/XRL/M03 (6.00-6.90M)** | **2108/XRL/M03 (3.00-3.45M) - DUPLICATE** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 21-MAR-2009 10:00 | 21-MAR-2009 10:50 | 21-MAR-2009 11:30 | 21-MAR-2009 10:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905734-001** | **HK0905734-002** | **HK0905734-003** | **HK0905734-004** | |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **67.3** | **78.0** | **73.7** | **77.8** | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **85.0** | **61.8** | **88.6** | **82.7** | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **65.3** | **76.0** | **71.6** | **74.8** | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **73.0** | **86.0** | **82.2** | **84.4** | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **103** | **102** | **90.7** | **100** | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **66.0** | **87.8** | **77.6** | **77.0** | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **87.0** | **113** | **99.4** | **101** | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M03 (3.00-3.90M)** | **2108/XRL/M03 (4.50-5.40M)** | **2108/XRL/M03 (6.00-6.90M)** | **2108/XRL/M03 (3.00-3.45M) - DUPLICATE** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 14-APR-2009 12:00 | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905734-001** | **HK0905734-002** | **HK0905734-003** | **HK0905734-004** | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | <0.2 | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | **1** | |

| Sub-Matrix: **WATER** | | | *Client sample ID* | **TRIP BLANK** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sampling date / time* | [21-MAR-2009] | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0905734-005** | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | <20 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | <5 | | | | |
| **Toluene** | 108-88-3 | 5 | µg/L | <5 | | | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | <10 | | | | |
| **Styrene** | 100-42-5 | 5 | µg/L | <5 | | | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | | | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | <5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **106** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **102** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **99.9** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **106** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **102** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **99.9** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 933611)** | | | | | | | | |
| HK0905731-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 19.3 | 19.3 | 0.0 |
| HK0905735-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 21.1 | 21.2 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | |
| HK0905731-001 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | |
| HK0905734-002 | 2108/XRL/M03 (4.50-5.40M) | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 35 | 38 | 7.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 75 | 72 | 5.1 |
| HK0905735-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 14 | 14.9 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 53 | 58 | 9.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 60 | 62 | 3.0 |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0905735-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | |
| HK0905731-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | |
| HK0905731-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859) - Continued** | | | | | | | | |
| HK0905731-001 | Anonymous | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | |
| HK0905731-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880) - Continued** | | | | | | | | |
| HK0905735-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | |
| HK0905352-002 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | 6 | 5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 943995)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | .1859 mg/kg<br>---- | 99.6<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | 10 mg/kg<br>---- | 98.0<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 95.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 87.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 87.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 95.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 88.4 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 933638) - Continued** | | | | | | | | | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.2 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 70.3 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.4 | ---- | 31 | 119 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 58.8 | ---- | 33 | 127 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 129 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 5.0 mg/kg | 88.9 | ---- | 16 | 138 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.6 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.0 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.4 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.0 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 102 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865) - Continued** | | | | | | | | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 86.4 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.7 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 94.2 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 74.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 93.9 | ---- | 60 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 85.7 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 83.0 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 87.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 87.0 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 96.6 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 86.6 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 94.4 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 83.4 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 99.8 | ---- | 77 | 120 | ---- | ---- |

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

Matrix: **SOIL**

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.5 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 91.1 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 91.2 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 103 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 87.8 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 65.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.3 | 93.1 | 75 | 125 | 0.2 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 11 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905264 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 18-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 07-APR-2009 |
| C-O-C number | : H004742 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 27-MAR-2009

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: **HK0905264**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M03 (1.00-1.90M) | 2108/XRL/M03 (2.00-2.90M) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 18-MAR-2009 14:30 | 18-MAR-2009 16:00 | | | |
| | | | | HK0905264-001 | HK0905264-002 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **15.4** | **15.4** | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **7** | **9** | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **46** | **60** | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | **4** | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **84** | **76** | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **7** | **27** | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M03 (1.00-1.90M) | 2108/XRL/M03 (2.00-2.90M) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 18-MAR-2009 14:30 | 18-MAR-2009 16:00 | | | |
| Compound | CAS Number | LOR | Unit | | HK0905264-001 | HK0905264-002 | | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **101** | **99.0** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.6** | **99.5** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **100** | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **101** | **99.0** | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **98.6** | **99.5** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **102** | **100** | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **57.0** | **73.6** | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **68.7** | **71.5** | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **70.0** | **87.2** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M03 (1.00-1.90M)** | **2108/XRL/M03 (2.00-2.90M)** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 18-MAR-2009 14:30 | 18-MAR-2009 16:00 | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905264-001** | **HK0905264-002** | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **80.7** | **78.5** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **77.6** | **79.1** | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **75.1** | **77.7** | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **75.8** | **78.1** | | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **74.8** | **77.1** | | | |

| Sub-Matrix: TCLP LEACHATE | | | | Client sample ID | 2108/XRL/M03 (1.00-1.90M) | 2108/XRL/M03 (2.00-2.90M) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 18-MAR-2009 12:00 | 18-MAR-2009 12:00 | | | |
| Compound | CAS Number | LOR | Unit | | HK0905264-001 | HK0905264-002 | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | 1 | 1 | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 926756)** | | | | | | | | |
| HK0905167-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 13.4 | 12.7 | 5.4 |
| HK0905264-001 | 2108/XRL/M03 (1.00-1.90M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 15.4 | 15.6 | 0.8 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 928467)** | | | | | | | | |
| HK0905257-002 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | |
| HK0905066-006 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 69 | 70 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 34 | 37 | 7.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 8 | 6 | 19.3 |
| | | EG020: Zinc | 7440-66-6 | 20 | mg/kg | 88 | 71 | 20.7 |
| HK0905121-003 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 4 | 4 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 1 | 1 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 46 | 43 | 7.1 |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | |
| HK0905056-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| HK0905271-003 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | |
| HK0905257-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | |
| HK0905257-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285)** | | | | | | | | |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285) - Continued** | | | | | | | | |
| HK0905257-001 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 926285)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 926288)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 926287)** | | | | | | | | |
| HK0905257-001 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 932238)** | | | | | | | | |
| HK0905264-002 | 2108/XRL/M03 (2.00-2.90M) | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 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 | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 928467)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1.0 | mg/kg | ----<br><1 | 10 mg/kg<br>---- | 94.0<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 85.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 90.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 109 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 89.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 89.4 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 101 | ---- | 57 | 141 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 88.4 | ---- | 31 | 119 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 73.7 | ---- | 33 | 127 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 926285)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 119 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 120 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 119 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 117 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 926285)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 93.3<br>---- | ----<br>---- | 16<br>---- | 138<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 926285)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 121 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 127 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 926285)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 110 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 926288)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.3 | ---- | 49 | 119 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.8 | ---- | 63 | 109 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.5 | ---- | 56 | 114 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 926288) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.4 | ---- | 70 | 110 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.9 | ---- | 68 | 116 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.4 | ---- | 68 | 114 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.4 | ---- | 70 | 108 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.4 | ---- | 68 | 112 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.9 | ---- | 70 | 111 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.2 | ---- | 65 | 114 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.5 | ---- | 69 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 88.1 | ---- | 69 | 121 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.1 | ---- | 62 | 113 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 79.6 | ---- | 66 | 114 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.8 | ---- | 71 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.7 | ---- | 66 | 111 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 926288)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 99.6 | ---- | 60 | 119 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 926287)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 109 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 932238)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 100 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 926718)** | | | | | | | | | | |
| HK0905066-003 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 87.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 76.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 90.3 | ---- | 75 | 125 | ---- | ---- |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 926718) - Continued** | | | | | | | | | | |
| HK0905066-003 | Anonymous | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 926735)** | | | | | | | | | | |
| HK0905052-002 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 112 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926286)** | | | | | | | | | | |
| HK0905257-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 926289)** | | | | | | | | | | |
| HK0905257-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 96.7 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 74.7 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 932238)** | | | | | | | | | | |
| HK0905264-001 | 2108/XRL/M03 (1.00-1.90M) | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 103 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-066S: PCB Surrogate - Continued** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 12 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905735 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 23-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 17-APR-2009 |
| C-O-C number | : H004744, H004577 | | | No. of samples received | : 3 |
| Site | : ---- | | | No. of samples analysed | : 3 |

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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** | **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: 31-MAR-2009

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: **HK0905735**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M04 (0.50-1.40M) | 2108/XRL/M04 (1.50-2.40M) | 2108/XRL/M04 (0.50-1.40M) - DUPLICATE | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 23-MAR-2009 15:00 | 23-MAR-2009 15:40 | 23-MAR-2009 15:00 | | |
| | | | | HK0905735-001 | HK0905735-002 | HK0905735-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **21.1** | **21.5** | **21.1** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **12** | **9** | **11** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **53** | **86** | **94** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **8** | **6** | **8** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **60** | **61** | **122** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **12** | **8** | **11** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M04 (0.50-1.40M) | 2108/XRL/M04 (1.50-2.40M) | 2108/XRL/M04 (0.50-1.40M) - DUPLICATE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 23-MAR-2009 15:00 | 23-MAR-2009 15:40 | 23-MAR-2009 15:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0905735-001 | HK0905735-002 | HK0905735-003 | | |
| **EP-074L: Methyl-tert-butyl Ether - Continued** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **94.8** | **96.7** | **98.6** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **107** | **108** | **108** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **105** | **107** | **105** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **94.8** | **96.7** | **98.6** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **107** | **108** | **108** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **105** | **107** | **105** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **74.8** | **63.0** | **76.3** | | |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M04 (0.50-1.40M)** | **2108/XRL/M04 (1.50-2.40M)** | **2108/XRL/M04 (0.50-1.40M) - DUPLICATE** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 23-MAR-2009 15:00 | 23-MAR-2009 15:40 | 23-MAR-2009 15:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905735-001** | **HK0905735-002** | **HK0905735-003** | | |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **80.6** | **67.8** | **83.5** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **79.0** | **75.2** | **77.9** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **77.8** | **65.5** | **79.0** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **86.6** | **74.1** | **87.1** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **101** | **102** | **87.6** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **63.6** | **61.4** | **73.0** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **73.8** | **76.8** | **88.6** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M04 (0.50-1.40M)** | **2108/XRL/M04 (1.50-2.40M)** | **2108/XRL/M04 (0.50-1.40M) - DUPLICATE** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 18-MAR-2009 12:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905735-001** | **HK0905735-002** | **HK0905735-003** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 933611)** | | | | | | | | |
| HK0905731-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 19.3 | 19.3 | 0.0 |
| HK0905735-001 | 2108/XRL/M04 (0.50-1.40M) | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 21.1 | 21.2 | 0.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | |
| HK0905734-002 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 35 | 38 | 7.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 75 | 72 | 5.1 |
| HK0905735-001 | 2108/XRL/M04 (0.50-1.40M) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | 14 | 14.9 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 53 | 58 | 9.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 60 | 62 | 3.0 |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | |
| HK0905731-002 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| HK0905735-001 | 2108/XRL/M04 (0.50-1.40M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | |
| HK0905731-001 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | |
| HK0905731-001 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 932859)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | |
| HK0905731-001 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | |
| HK0905731-003 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | |
| HK0905731-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880) - Continued** | | | | | | | | |
| HK0905735-001 | 2108/XRL/M04 (0.50-1.40M) | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | 10 mg/kg<br>---- | 98.0<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 95.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 87.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 87.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.2 | 0.1 mg/kg | 95.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 88.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.2 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <0.5 | 40 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 70.3 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 76.4 | ---- | 31 | 119 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 58.8 | ---- | 33 | 127 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 932859)** | | | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.4 | ---- | 57 | 144 | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 66 | 128 | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 76 | 134 | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 129 | ---- | 69 | 142 | ---- | ---- |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 105 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 932859)** | | | | | | | | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5<br>---- | ----<br>5.0 mg/kg | ----<br>88.9 | ----<br>---- | ----<br>16 | ----<br>138 | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 932859)** | | | | | | | | | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.8 | ---- | 65 | 134 | ---- | ---- |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859)** | | | | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 90.6 | ---- | 59 | 145 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 932859) - Continued** | | | | | | | | | | | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 92.0 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 932865)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 77.4 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 932865)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.1 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.0 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.7 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.0 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 94.3 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 86.4 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.7 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.2 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 80.2 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 932865)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 94.2 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 932864)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 74.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.002 mg/L | 100 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | MS | MSD | Low | High | Value | Control Limit |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 933638)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 93.5 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 91.1 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 91.2 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 933651)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 103 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932860)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 932866)** | | | | | | | | | | |
| HK0905731-002 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 87.8 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 65.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 935165)** | | | | | | | | | | |
| HK0905352-003 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.002 mg/L | 96.5 | 99.0 | 75 | 125 | 2.6 | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.3 | 93.1 | 75 | 125 | 0.2 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 25 | 121 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-075S: Acid Extractable Surrogates - Continued** | | | |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem HK Pty Ltd | Page | : 1 of 18 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0905819 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 24-MAR-2009 |
| Order number | : ---- | | | Issue Date | : 20-APR-2009 |
| C-O-C number | : H004747-H004748 | | | No. of samples received | : 6 |
| Site | : ---- | | | No. of samples analysed | : 6 |

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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** | **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: 30-MAR-2009

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: **HK0905819**

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

**Water sample(s) analysed and reported on an as received basis.**

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

**Water sample(s) were filtered prior to dissolved metal analysis.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/M04 (3.00-3.90M) | 2108/XRL/M04 (4.50-5.40M) | 2108/XRL/M04 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 24-MAR-2009 10:35 | 24-MAR-2009 11:30 | 24-MAR-2009 14:00 | | |
| | | | | HK0905819-001 | HK0905819-002 | HK0905819-003 | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **15.0** | **4.9** | **24.8** | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | <1 | <1 | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **6** | **2** | **21** | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **40** | **23** | **89** | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | <0.2 | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | **1** | **3** | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **50** | **17** | **117** | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **5** | **2** | **4** | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | <1 | <1 | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | <5 | <5 | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | <200 | <200 | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | <1.0 | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | <5 | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | <5 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | <5 | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | <0.5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | <5.0 | | |

| Sub-Matrix: SOIL | | | | Client sample ID | 2108/XRL/M04 (3.00-3.90M) | 2108/XRL/M04 (4.50-5.40M) | 2108/XRL/M04 (6.00-6.90M) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 24-MAR-2009 10:35 | 24-MAR-2009 11:30 | 24-MAR-2009 14:00 | | |
| Compound | CAS Number | LOR | Unit | | HK0905819-001 | HK0905819-002 | HK0905819-003 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | <1.0 | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.1** | **94.2** | **94.6** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.9** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **104** | **103** | **105** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | | **92.1** | **94.2** | **94.6** | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | | **99.9** | **100** | **100** | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | | **104** | **103** | **105** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | | **73.3** | **70.4** | **78.3** | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | | **70.1** | **66.1** | **76.3** | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | | **84.2** | **73.8** | **85.1** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/M04 (3.00-3.90M)** | **2108/XRL/M04 (4.50-5.40M)** | **2108/XRL/M04 (6.00-6.90M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 24-MAR-2009 10:35 | 24-MAR-2009 11:30 | 24-MAR-2009 14:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905819-001** | **HK0905819-002** | **HK0905819-003** | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **72.8** | **74.2** | **80.1** | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **82.1** | **79.2** | **81.7** | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **105** | **99.1** | **106** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **65.0** | **58.0** | **64.2** | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **82.6** | **70.4** | **81.4** | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/M04 (3.00-3.90M)** | **2108/XRL/M04 (4.50-5.40M)** | **2108/XRL/M04 (6.00-6.90M)** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 14-APR-2009 12:00 | 14-APR-2009 12:00 | 14-APR-2009 12:00 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905819-001** | **HK0905819-002** | **HK0905819-003** | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | <0.2 | <0.2 | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | **1** | **1** | | |

| Sub-Matrix: WATER | | | | Client sample ID | TRIP BLANK | FIELD BLANK | EQUIPMENT BLANK | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [24-MAR-2009] | 24-MAR-2009 13:00 | 24-MAR-2009 13:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0905819-004 | HK0905819-005 | HK0905819-006 | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | | |
| **EK025MD: Free Cyanide** | ---- | 0.01 | mg/L | | ---- | <0.01 | <0.01 | | |
| **EG: Metals and Major Cations** | | | | | | | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 0.02 | mg/L | | ---- | <0.02 | <0.02 | | |
| **EG050: Hexavalent Chromium** | 18540-29-9 | 0.02 | mg/L | | ---- | <0.02 | <0.02 | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.0002 | mg/L | | ---- | <0.0002 | <0.0002 | | |
| **EG020: Copper** | 7440-50-8 | 0.001 | mg/L | | ---- | <0.001 | <0.001 | | |
| **EG020: Lead** | 7439-92-1 | 0.001 | mg/L | | ---- | <0.001 | **0.001** | | |
| **EG020: Mercury** | 7439-97-6 | 0.0001 | mg/L | | ---- | <0.0001 | <0.0001 | | |
| **EG020: Nickel** | 7440-02-0 | 0.001 | mg/L | | ---- | <0.001 | <0.001 | | |
| **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | | ---- | <0.01 | **0.20** | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 20 | µg/L | | <20 | <20 | <20 | | |
| **C9 - C16 Fraction** | ---- | 500 | µg/L | | ---- | <500 | <500 | | |
| **C17 - C35 Fraction** | ---- | 500 | µg/L | | ---- | <500 | <500 | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | | |
| **Benzene** | 71-43-2 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Toluene** | 108-88-3 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Ethylbenzene** | 100-41-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 10 | µg/L | | <10 | <10 | <10 | | |
| **Styrene** | 100-42-5 | 5 | µg/L | | <5 | <5 | <5 | | |
| **ortho-Xylene** | 95-47-6 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | | <50 | **80** | <50 | | |
| **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | | <50 | <50 | <50 | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 50 | µg/L | | <50 | <50 | <50 | | |
| **Trichloroethene** | 79-01-6 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Tetrachloroethene** | 127-18-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | | |
| **Chloroform** | 67-66-3 | 5 | µg/L | | <5 | <5 | <5 | | |
| **Bromodichloromethane** | 75-27-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | | <5 | <5 | <5 | | |
| **EP-075A: Phenols** | | | | | | | | | |
| **Phenol** | 108-95-2 | 2 | µg/L | | ---- | <2 | <2 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | | |
| **Naphthalene** | 91-20-3 | 2 | µg/L | | ---- | <2 | <2 | | |

| Sub-Matrix: WATER | | | | Client sample ID | TRIP BLANK | FIELD BLANK | EQUIPMENT BLANK | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [24-MAR-2009] | 24-MAR-2009 13:00 | 24-MAR-2009 13:30 | | |
| Compound | CAS Number | LOR | Unit | | HK0905819-004 | HK0905819-005 | HK0905819-006 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) - Continued** | | | | | | | | | |
| Acenaphthylene | 208-96-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| Acenaphthene | 83-32-9 | 2 | µg/L | | ---- | <2 | <2 | | |
| Fluorene | 86-73-7 | 2 | µg/L | | ---- | <2 | <2 | | |
| Phenanthrene | 85-01-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| Anthracene | 120-12-7 | 2 | µg/L | | ---- | <2 | <2 | | |
| Fluoranthene | 206-44-0 | 2 | µg/L | | ---- | <2 | <2 | | |
| Pyrene | 129-00-0 | 2 | µg/L | | ---- | <2 | <2 | | |
| Benz(a)anthracene | 56-55-3 | 2 | µg/L | | ---- | <2 | <2 | | |
| Chrysene | 218-01-9 | 2 | µg/L | | ---- | <2 | <2 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | | ---- | <4 | <4 | | |
| Benzo(a)pyrene | 50-32-8 | 2 | µg/L | | ---- | <2 | <2 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 2 | µg/L | | ---- | <2 | <2 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 2 | µg/L | | ---- | <2 | <2 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 2 | µg/L | | ---- | <2 | <2 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 20 | µg/L | | ---- | <20 | <20 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | | ---- | <4 | <4 | | |
| **EP-066_67: Total Polychlorinated Biphenyls** | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | | ---- | <0.01 | <0.01 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **102** | **102** | **104** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **99.5** | **97.5** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **97.6** | **98.5** | **96.4** | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | **102** | **102** | **104** | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **100** | **99.5** | **97.5** | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **97.6** | **98.5** | **96.4** | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | ---- | **30.1** | **26.5** | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | ---- | **28.0** | **25.0** | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | ---- | **80.8** | **65.7** | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | ---- | **62.3** | **54.8** | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | ---- | **63.2** | **53.5** | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | ---- | **79.4** | **67.4** | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: **WATER** | | | | *Client sample ID* | **TRIP BLANK** | **FIELD BLANK** | **EQUIPMENT BLANK** | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | [24-MAR-2009] | 24-MAR-2009 13:00 | 24-MAR-2009 13:30 | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0905819-004** | **HK0905819-005** | **HK0905819-006** | | |
| **EP-066S: PCB Surrogate - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | ---- | **93.0** | **97.8** | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 935138)** | | | | | | | | |
| HK0905714-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 46.2 | 46.3 | 0.2 |
| HK0905806-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 11.8 | 10.8 | 9.2 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | |
| HK0905734-002 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 934218)** | | | | | | | | |
| HK0905819-002 | 2108/XRL/M04 (4.50-5.40M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | |
| HK0905751-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 5 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 16 | 15 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 10 | 9 | 11.3 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 64 | 68 | 7.4 |
| HK0905802-005 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.01 | mg/kg | 0.13 | 0.13 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.02 | mg/kg | 0.05 | 0.05 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 0.05 | mg/kg | 18.8 | 21.1 | 11.9 |
| | | EG020: Lead | 7439-92-1 | 0.05 | mg/kg | 30.0 | 27.0 | 10.6 |
| | | EG020: Nickel | 7440-02-0 | 0.05 | mg/kg | 3.72 | 3.75 | 0.7 |
| | | EG020: Zinc | 7440-66-6 | 0.5 | mg/kg | 247 | 292 | 16.8 |
| **EG: Metals and Major Cations (QC Lot: 937940)** | | | | | | | | |
| HK0905826-001 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 9 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 24 | 25 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 15 | 14 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 58 | 52 | 11.1 |
| HK0905900-006 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.06 | 0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | 0.4 | 0.4 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 31 | 33 | 4.1 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 40 | 47 | 15.8 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 160 | 163 | 1.8 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | |
| HK0905756-004 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | |
| HK0905756-004 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 935783)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 935801)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 935800)** | | | | | | | | |
| HK0905756-004 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | |
| HK0905352-003 | Anonymous | **EK025MD: Free Cyanide** | ---- | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | |
| HK0905756-003 | Anonymous | **EG050: Hexavalent Chromium** | 18540-29-9 | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | |
| HK0905447-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.0005 | mg/L | <0.0005 | <0.0005 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.002 | mg/L | <0.002 | <0.002 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | 0.06 | 0.06 | 0.0 |
| HK0905819-005 | FIELD BLANK | **EG020: Mercury** | 7439-97-6 | 0.0001 | mg/L | <0.0001 | <0.0001 | 0.0 |
| | | **EG020: Cadmium** | 7440-43-9 | 0.0002 | mg/L | <0.0002 | <0.0002 | 0.0 |
| | | **EG020: Copper** | 7440-50-8 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Lead** | 7439-92-1 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Nickel** | 7440-02-0 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | **EG020: Zinc** | 7440-66-6 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | |
| HK0905731-002 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| HK0905735-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | |
| HK0905352-002 | Anonymous | **C6 - C8 Fraction** | ---- | 0.02 | mg/L | <0.02 | <0.02 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **meta- & para-Xylene** | 108-38-3<br>106-42-3 | 10 | µg/L | <10 | <10 | 0.0 |
| | | **Benzene** | 71-43-2 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Toluene** | 108-88-3 | 5 | µg/L | 6 | 5 | 0.0 |
| | | **Ethylbenzene** | 100-41-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Styrene** | 100-42-5 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **ortho-Xylene** | 95-47-6 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **2-Propanone (Acetone)** | 67-64-1 | 50 | µg/L | <50 | <50 | 0.0 |
| | | **2-Butanone (MEK)** | 78-93-3 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416) - Continued** | | | | | | | | |
| HK0905352-002 | Anonymous | **Trichloroethene** | 79-01-6 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Tetrachloroethene** | 127-18-4 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Methylene chloride** | 75-09-2 | 50 | µg/L | <50 | <50 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Chloroform** | 67-66-3 | 5 | µg/L | <5 | <5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 5 | µg/L | <5 | <5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 934416)** | | | | | | | | |
| HK0905352-002 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5 | µg/L | <5 | <5 | 0.0 |

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

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 947594)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1.0 | mg/kg | ----<br><1 | 10 mg/kg<br>---- | 98.0<br>---- | ----<br>---- | 85<br>---- | 115<br>---- | ----<br>---- | ----<br>---- |
| **EG: Metals and Major Cations (QC Lot: 934218)** | | | | | | | | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 0.5 | mg/kg | <1 | 40 mg/kg | 105 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 93.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 96.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 95.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 95.2 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937940)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 95.8 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 106 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 93.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 98.8 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 96.3 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 103 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | 3 mg/kg | 66.1 | ---- | 61 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | 31 mg/kg | 56.4 | ---- | 28 | 132 | ---- | ---- |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | 75 mg/kg | 55.0 | ---- | 27 | 143 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 935783)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 935783) - Continued** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 106 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 121 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 133 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 131 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 935783)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 105 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 935783)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 103 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 117 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 935783)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 101 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.6 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 935801)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 82.9 | ---- | 52 | 98 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 935801)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.4 | ---- | 57 | 103 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.9 | ---- | 61 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 90.7 | ---- | 64 | 106 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 92.7 | ---- | 68 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 98.9 | ---- | 71 | 101 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 63 | 101 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 65 | 102 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.3 | ---- | 64 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 89.8 | ---- | 71 | 100 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.1 | ---- | 68 | 102 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 102 | ---- | 67 | 109 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.3 | ---- | 59 | 103 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.8 | ---- | 64 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.4 | ---- | 64 | 106 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.8 | ---- | 63 | 104 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 935801)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 92.8 | ---- | 67 | 106 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 935800)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 91.3 | ---- | 71 | 138 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | | | | |
| EK025MD: Free Cyanide | ---- | 0.01 | mg/L | <0.01 | 0.2 mg/L | 106 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | | | | |
| EG050: Hexavalent Chromium | 18540-29-9 | 0.02 | mg/L | <0.02 | 0.5 mg/L | 97.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.0002 | mg/L | <0.0002 | 0.1 mg/L | 87.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 90.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 93.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.002 mg/L | 94.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 0.001 | mg/L | <0.001 | 0.1 mg/L | 91.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 0.01 | mg/L | <0.01 | 0.1 mg/L | 90.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | | |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.2 | 0.02 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934349)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.25 mg/L | 66.0 | ---- | 25 | 90 | ---- | ---- |
| C17 - C35 Fraction | ---- | 0.5 | mg/L | <0.5 | 0.5 mg/L | 71.1 | ---- | 29 | 116 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 934417)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 0.02 | mg/L | <0.02 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 0.15 mg/L | 93.9 | ---- | 60 | 139 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 934416)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 5 | µg/L | <5 | 10 µg/L | 85.7 | ---- | 54 | 132 | ---- | ---- |
| Toluene | 108-88-3 | 5 | µg/L | <5 | 10 µg/L | 83.0 | ---- | 59 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 5 | µg/L | <5 | 10 µg/L | 87.6 | ---- | 68 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 10 | µg/L | <10 | 20 µg/L | 87.0 | ---- | 75 | 122 | ---- | ---- |
| Styrene | 100-42-5 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 73 | 119 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 5 | µg/L | <5 | 10 µg/L | 96.6 | ---- | 72 | 125 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 934416)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 50 | µg/L | <50 | 100 µg/L | 86.6 | ---- | 63 | 126 | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 934416)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 5 | µg/L | <5 | 10 µg/L | 94.4 | ---- | 67 | 125 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 5 | µg/L | <5 | 10 µg/L | 83.4 | ---- | 59 | 126 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 934416)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 5 | µg/L | <5 | 10 µg/L | 92.5 | ---- | 68 | 123 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 5 | µg/L | <5 | 10 µg/L | 99.8 | ---- | 77 | 120 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 934347)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 2 | µg/L | <2 | 5 µg/L | 45.0 | ---- | 9 | 85 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 934347)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 2 | µg/L | <2 | 5 µg/L | 75.7 | ---- | 67 | 100 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 2 | µg/L | <2 | 5 µg/L | 70.3 | ---- | 64 | 100 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 934347) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 2 | µg/L | <2 | 5 µg/L | 74.8 | ---- | 53 | 102 | ---- | ---- |
| Fluorene | 86-73-7 | 2 | µg/L | <2 | 5 µg/L | 80.9 | ---- | 63 | 103 | ---- | ---- |
| Phenanthrene | 85-01-8 | 2 | µg/L | <2 | 5 µg/L | 91.7 | ---- | 65 | 102 | ---- | ---- |
| Anthracene | 120-12-7 | 2 | µg/L | <2 | 5 µg/L | 92.6 | ---- | 62 | 102 | ---- | ---- |
| Fluoranthene | 206-44-0 | 2 | µg/L | <2 | 5 µg/L | 99.3 | ---- | 74 | 107 | ---- | ---- |
| Pyrene | 129-00-0 | 2 | µg/L | <2 | 5 µg/L | 97.1 | ---- | 74 | 108 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 2 | µg/L | <2 | 5 µg/L | 88.8 | ---- | 55 | 122 | ---- | ---- |
| Chrysene | 218-01-9 | 2 | µg/L | <2 | 5 µg/L | 98.2 | ---- | 64 | 115 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 4 | µg/L | <4 | 10 µg/L | 106 | ---- | 70 | 112 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 2 | µg/L | <2 | 5 µg/L | 99.4 | ---- | 64 | 105 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 2 | µg/L | <2 | 5 µg/L | 83.0 | ---- | 77 | 106 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 2 | µg/L | <2 | 5 µg/L | 83.2 | ---- | 72 | 109 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 2 | µg/L | <2 | 5 µg/L | 87.9 | ---- | 73 | 109 | ---- | ---- |
| **EP-075C: Phthalate Esters (QC Lot: 934347)** | | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 20 | µg/L | <20 | 5 µg/L | 97.8 | ---- | 79 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 934347)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 4 | µg/L | <4 | 5 µg/L | 81.8 | ---- | 66 | 107 | ---- | ---- |
| **EP-066_67: Total Polychlorinated Biphenyls (QC Lot: 934348)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.01 | µg/L | <0.01 | 0.1 µg/L | 124 | ---- | 59 | 149 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 934218)** | | | | | | | | | | |
| HK0905819-001 | 2108/XRL/M04 (3.00-3.90M) | **EG3060: Hexavalent Chromium** | 18540-29-9 | 40 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937939)** | | | | | | | | | | |
| HK0905751-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 95.0 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 84.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | 84.7 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 107 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 82.3 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 937940)** | | | | | | | | | | |
| HK0905819-003 | 2108/XRL/M04 (6.00-6.90M) | **EG020: Cadmium** | 7440-43-9 | 5 mg/kg | 96.4 | ---- | 75 | 125 | ---- | ---- |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 937940) - Continued** | | | | | | | | | | |
| HK0905819-003 | 2108/XRL/M04 (6.00-6.90M) | **EG020: Copper** | 7440-50-8 | 5 mg/kg | 99.2 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Lead** | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.1 mg/kg | 102 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 5 mg/kg | 98.6 | ---- | 75 | 125 | ---- | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935784)** | | | | | | | | | | |
| HK0905756-005 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 73.5 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 935802)** | | | | | | | | | | |
| HK0905756-005 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 71.6 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 64.1 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 935486)** | | | | | | | | | | |
| HK0905352-001 | Anonymous | **EK025MD: Free Cyanide** | ---- | 0.2 mg/L | 106 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 934566)** | | | | | | | | | | |
| HK0905756-002 | Anonymous | **EG050: Hexavalent Chromium** | 18540-29-9 | 0.5 mg/L | 91.6 | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 934634)** | | | | | | | | | | |
| HK0905352-001 | Anonymous | **EG020: Cadmium** | 7440-43-9 | 0.1 mg/L | 97.4 | 91.8 | 75 | 125 | 5.9 | ---- |
| | | **EG020: Copper** | 7440-50-8 | 0.1 mg/L | 96.4 | 91.5 | 75 | 125 | 5.2 | ---- |
| | | **EG020: Lead** | 7439-92-1 | 0.1 mg/L | 86.2 | 89.6 | 75 | 125 | 4.0 | ---- |
| | | **EG020: Mercury** | 7439-97-6 | 0.002 mg/L | 99.5 | 105 | 75 | 125 | 5.4 | ---- |
| | | **EG020: Nickel** | 7440-02-0 | 0.1 mg/L | 93.9 | 92.4 | 75 | 125 | 1.6 | ---- |
| | | **EG020: Zinc** | 7440-66-6 | 0.1 mg/L | 92.0 | 97.2 | 75 | 125 | 5.6 | ---- |
| **EG: Metals and Major Cations - Filtered (QC Lot: 941880)** | | | | | | | | | | |
| HK0905731-001 | Anonymous | **EG020: Mercury** | 7439-97-6 | 0.02 mg/L | 93.3 | 93.1 | 75 | 125 | 0.2 | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |

Sub-Matrix: **SOIL**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

Sub-Matrix: **WATER**

| | | Recovery Limits (%) | |
|---|---|---|---|
| ***Compound*** | ***CAS Number*** | ***Low*** | ***High*** |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 86 | 118 |
| **Toluene-D8** | 2037-26-5 | 88 | 110 |
| **4-Bromofluorobenzene** | 460-00-4 | 86 | 115 |
| **EP-075S: Acid Extractable Surrogates** | | | |
| **2-Fluorophenol** | 367-12-4 | 21 | 100 |
| **Phenol-d6** | 13127-88-3 | 20 | 94 |
| **2.4.6-Tribromophenol** | 118-79-6 | 20 | 123 |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | |
| **Nitrobenzene -d5** | 4165-60-0 | 35 | 114 |
| **2-Fluorobiphenyl** | 321-60-8 | 43 | 116 |
| **4-Terphenyl-d14** | 1718-51-0 | 33 | 141 |
| **EP-066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 50 | 130 |

**Site H**

**(2108/XRL/D329, 2108/XRL/EDH27 to 2108/XRL/EDH28)**

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/587<br>**FILE REF** :<br>**SIGNED** : P.P. John Fung<br>**DATE** : 06 November 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole no. 2108/XRL/D329 | N | GCE/NEX/2108/2008/S587 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0816122 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : MTR CORPORATION LIMITED CONTRACT NEX_2108 GROUND INVESTIGATION WORKS FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 26-SEP-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H004105 | | | No. of samples received | : 2 |
| Site | : ---- | | | No. of samples analysed | : 2 |

## 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: 14-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0816122**

**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.**

**Sample(s) as received, digested by in-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**This report may not be reproduced except with prior written approval from the testing laboratory.**

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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

| Sub-Matrix: SEDIMENT | | | Client sample ID | 2108/XRL/D329 (1.5-1.85) | 2108/XRL/D329 (3.0-3.33) |
|---|---|---|---|---|---|
| | | | Client sampling date / time | 26-SEP-2008 13:45 | 26-SEP-2008 15:15 |
| Compound | CAS Number | LOR | Unit | HK0816122-001 | HK0816122-002 |
| **EA/ED: Physical and Aggregate Properties** | | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 10.5 | 11.4 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 |
| **EG: Metals and Major Cations** | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 6 | 9 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 143 | 62 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 16 | <1 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 158 | 1220 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 34 | 2 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/D329 (1.5-1.85) | 2108/XRL/D329 (3.0-3.33) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 26-SEP-2008 13:45 | 26-SEP-2008 15:15 | | |
| Compound | CAS Number | LOR | Unit | | HK0816122-001 | HK0816122-002 | | |
| **EP-075A: Phenols** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | | <1.0 | <1.0 | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | <0.5 | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | | <5.0 | <5.0 | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | | <0.2 | <0.2 | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | | <0.1 | <0.1 | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 85.0 | 86.3 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 96.5 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 103 | 103 | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 85.0 | 86.3 | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.0 | 96.5 | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 103 | 103 | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 45.5 | 51.3 | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 44.2 | 52.8 | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 41.1 | 44.0 | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/D329 (1.5-1.85) | 2108/XRL/D329 (3.0-3.33) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 26-SEP-2008 13:45 | 26-SEP-2008 15:15 | | | |
| Compound | CAS Number | LOR | Unit | | HK0816122-001 | HK0816122-002 | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 50.7 | 61.1 | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 43.8 | 48.0 | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 40.3 | 52.8 | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. | |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 100 | 104 | | | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 105 | 99.6 | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 775082)** | | | | | | | | |
| HK0815962-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 24.7 | 25.0 | 1.0 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | |
| HK0815703-001 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 775789)** | | | | | | | | |
| HK0816122-002 | 2108/XRL/D329 (3.0-3.33) | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 9 | 11 | 19.8 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 62 | 69 | 10.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | <1 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 1220 | 1320 | 8.3 |
| **EG: Metals and Major Cations (QC Lot: 775790)** | | | | | | | | |
| HK0816122-002 | 2108/XRL/D329 (3.0-3.33) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775478)** | | | | | | | | |
| HK0816122-001 | 2108/XRL/D329 (1.5-1.85) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775479)** | | | | | | | | |
| HK0816122-001 | 2108/XRL/D329 (1.5-1.85) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | |
| HK0815703-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | Spike Recovery (%): DCS | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 9.48 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 775789)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 90.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 93.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 94.7 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 97.5 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 88.4 | ---- | 85 | 115 | ---- | ---- |

| Matrix: SOIL | | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| Method: Compound | CAS Number | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 775790)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775478)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 102 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775479)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 106 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | # 114 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 108 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 109 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 128 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.8 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.1 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.7 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.5 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 64.1 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.9 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.0 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 65.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 68.4 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 67.6 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 81.4 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.7 | ---- | 60 | 104 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321) - Continued** | | | | | | | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.8 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.2 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.0 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 75.4 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 126 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 775789)** | | | | | | | | | | |
| HK0816122-001 | 2108/XRL/D329 (1.5-1.85) | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 91.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 82.2 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 94.6 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 86.7 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 775790)** | | | | | | | | | | |
| HK0816122-001 | 2108/XRL/D329 (1.5-1.85) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 108 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775478)** | | | | | | | | | | |
| HK0816122-002 | 2108/XRL/D329 (3.0-3.33) | C6 - C8 Fraction | ---- | 3 mg/kg | 116 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 775479)** | | | | | | | | | | |
| HK0816122-002 | 2108/XRL/D329 (3.0-3.33) | C9 - C16 Fraction | ---- | 31 mg/kg | 76.8 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 84.4 | ---- | 50 | 130 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| Compound | CAS Number | Recovery Limits (%) Low | Recovery Limits (%) High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate - Continued** | | | |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| | | |
|---|---|---|
| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/425<br>**FILE REF** :<br>**SIGNED** : p.p. John Fung<br>**DATE** : 15 October 2008 |

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole no. 2108/XRL/D329 | N | GCE/NEX/2108/2008/S425 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*
N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.
c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0815703 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : MTR CORPORATION LIMITED CONTRACT NEX_2108 GROUND INVESTIGATION WORKS FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 25-SEP-2008 |
| Order number | : ---- | | | Issue Date | : 14-OCT-2008 |
| C-O-C number | : H004104 | | | 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 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: 14-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0815703**

**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.**

**Sample(s) as received, digested by in-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/D329 (0.5M-0.95M) |
|---|---|---|---|---|
| | | | Client sampling date / time | 25-SEP-2008 13:15 |
| | | | | HK0815703-001 |
| **EA/ED: Physical and Aggregate Properties** | | | | |
| EA055: Moisture Content (dried @ 103° C) | ---- | 0.1 | % | 11.9 |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 |
| **EG: Metals and Major Cations** | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 7 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 149 |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | <1 |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 |
| **EP-074B: Oxygenated Compounds** | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 |
| **EP-074E: Halogenated Aliphatics** | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 |
| **EP-074G: Trihalomethanes (THM)** | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 |
| **EP-074L: Methyl-tert-butyl Ether** | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 |

Sub-Matrix: **SEDIMENT**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/D329 (0.5M-0.95M)<br>Client sampling date / time: 25-SEP-2008 13:15<br>HK0815703-001 | |
|---|---|---|---|---|---|
| **EP-075A: Phenols** | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | |
| **EP-075C: Phthalate Esters** | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | |
| **EP-066: Polychlorinated Biphenyls** | | | | | |
| Total Polychlorinated biphenyls | ---- | 1.0 | mg/kg | <1.0 | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 82.6 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 97.1 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 103 | |
| **EP-074S: VOC Surrogates** | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 82.6 | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 97.1 | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 103 | |
| **EP-075S: Acid Extractable Surrogates** | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | 59.8 | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | 53.3 | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | 51.9 | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/D329 (0.5M-0.95M) | |
|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 25-SEP-2008 13:15 | |
| Compound | CAS Number | LOR | Unit | HK0815703-001 | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | 61.7 | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | 49.0 | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | 57.6 | | |
| **EP-066S: PCB Surrogate** | | | | | | Surrogate control limits listed at end of this report. |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | 105 | | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | 89.9 | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EA/ED: Physical and Aggregate Properties (QC Lot: 771654)** | | | | | | | | |
| HK0815369-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 17.9 | 17.8 | 0.9 |
| HK0815698-002 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 18.8 | 18.2 | 3.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 773206)** | | | | | | | | |
| HK0815369-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 7 | 6 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 13 | 13 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 11 | 10 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 155 | 144 | 7.9 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 773318)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 773322)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report LOR | Unit | Original Result | Duplicate Result | RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317) - Continued** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | Total Polychlorinated biphenyls | --- | 1.0 | mg/kg | <1.0 | <1.0 | 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 |
|---|---|

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 9.48 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 773206)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 92.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 91.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 88.1 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 97.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 89.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 92.7 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 773208)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 2.5 mg/kg | 93.7 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 773318)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 102 | ---- | 63 | 135 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 773322)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 77.9 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 75.0 | ---- | 50 | 111 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 108 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 109 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 128 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.8 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.1 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.7 | ---- | 49 | 103 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.5 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 64.1 | ---- | 56 | 104 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.9 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.0 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 65.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 68.4 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 67.6 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 81.4 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.7 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.8 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.2 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.0 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 75.4 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 126 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 773206)** | | | | | | | | | | |
| HK0815369-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 90.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 108 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | 86.2 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 87.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 82.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 773208)** | | | | | | | | | | |
| HK0815703-001 | 2108/XRL/D329 (0.5M-0.95M) | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 108 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: SEDIMENT

| | Recovery Limits (%) |
|---|---|

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/648<br>**FILE REF** :<br>**SIGNED** : p.p. John Fung<br>**DATE** : 20 November 2008 |
|---|---|---|

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole no. 2108/XRL/EDH27 | N | GCE/NEX/2108/2008/S648 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

## CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 4 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0820037 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | | |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 13-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 20-NOV-2008 |
| C-O-C number | : H005353 | | | 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 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: 19-NOV-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0820037**

**Sample(s) were received in a chilled condition.**

**Sample(s) analysed and reported on an as received basis.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98.**

**Water sample(s) were filtered prior to dissolved metal analysis.**

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| *Signatories* | *Position* | *Authorised results for* |
|---|---|---|
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: TCLP LEACHATE

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH27 0.50M<br>Client sampling date / time: 13-OCT-2008 14:15<br>HK0820037-001 |
|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered** | | | | |
| EG020: Antimony | 7440-36-0 | 1 | mg/L | <1 |
| EG020: Arsenic | 7440-38-2 | 1 | mg/L | <1 |
| EG020: Barium | 7440-39-3 | 1 | mg/L | <1 |
| EG020: Beryllium | 7440-41-7 | 1 | mg/L | <1 |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/L | <0.2 |
| EG020: Chromium | 7440-47-3 | 1 | mg/L | <1 |
| EG020: Copper | 7440-50-8 | 1 | mg/L | <1 |
| EG020: Lead | 7439-92-1 | 1 | mg/L | <1 |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/L | <0.2 |
| EG020: Nickel | 7440-02-0 | 1 | mg/L | <1 |
| EG020: Selenium | 7782-49-2 | 0.2 | mg/L | <0.2 |
| EG020: Silver | 7440-22-4 | 1 | mg/L | <1 |
| EG020: Thallium | 7440-28-0 | 1 | mg/L | <1 |
| EG020: Tin | 7440-31-5 | 1 | mg/L | <1 |
| EG020: Vanadium | 7440-62-2 | 1 | mg/L | <1 |
| EG020: Zinc | 7440-66-6 | 1 | mg/L | <1 |
| **Sample Preparation Method** | | | | |
| E-TCLP: Extraction Fluid Number | ---- | - | -- | 1 |

## Laboratory Duplicate (DUP) Report

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| EG: Metals and Major Cations - Filtered (QC Lot: 816733) | | | | | | | | |
| HK0819661-001 | Anonymous | EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | <0.0001 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.0002 | mg/L | <0.0002 | <0.0002 | 0.0 |
| | | EG020: Antimony | 7440-36-0 | 0.001 | mg/L | 0.013 | 0.011 | 17.3 |
| | | EG020: Barium | 7440-39-3 | 0.001 | mg/L | 0.102 | 0.085 | 18.5 |
| | | EG020: Beryllium | 7440-41-7 | 0.001 | mg/L | 0.001 | <0.001 | 0.0 |
| | | EG020: Chromium | 7440-47-3 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 0.001 | mg/L | 0.002 | 0.002 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 0.001 | mg/L | 0.011 | 0.010 | 0.0 |
| | | EG020: Silver | 7440-22-4 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | EG020: Thallium | 7440-28-0 | 0.001 | mg/L | <0.001 | <0.001 | 0.0 |
| | | EG020: Arsenic | 7440-38-2 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | EG020: Selenium | 7782-49-2 | 0.01 | mg/L | 0.02 | 0.01 | 0.0 |
| | | EG020: Tin | 7440-31-5 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | EG020: Vanadium | 7440-62-2 | 0.01 | mg/L | <0.01 | <0.01 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 0.01 | mg/L | 0.23 | 0.23 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 0.010 | mg/L | 1.92 | 1.65 | 15.5 |

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

Matrix: WATER

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| EG: Metals and Major Cations - Filtered (QC Lot: 816733) | | | | | | | | | | | |
| EG020: Antimony | 7440-36-0 | 0.001 | mg/L | <0.001 | 1 mg/L | 85.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Arsenic | 7440-38-2 | 0.01 | mg/L | <0.01 | 1 mg/L | 92.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Barium | 7440-39-3 | 0.001 | mg/L | <0.001 | 1 mg/L | 111 | ---- | 85 | 115 | ---- | ---- |
| EG020: Beryllium | 7440-41-7 | 0.001 | mg/L | <0.001 | 1 mg/L | 96.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Cadmium | 7440-43-9 | 0.0002 | mg/L | <0.0002 | 1 mg/L | 91.9 | ---- | 85 | 115 | ---- | ---- |
| EG020: Chromium | 7440-47-3 | 0.001 | mg/L | <0.001 | 1 mg/L | 98.2 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 0.001 | mg/L | <0.001 | 1 mg/L | 97.5 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 0.001 | mg/L | <0.01 | 1 mg/L | 89.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.0001 | mg/L | <0.0001 | 0.02 mg/L | 90.2 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 0.001 | mg/L | <0.001 | 1 mg/L | 95.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Selenium | 7782-49-2 | 0.01 | mg/L | <0.01 | 1 mg/L | 91.6 | ---- | 85 | 115 | ---- | ---- |
| EG020: Silver | 7440-22-4 | 0.001 | mg/L | <0.001 | 1 mg/L | 91.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Thallium | 7440-28-0 | 0.001 | mg/L | <0.001 | 1 mg/L | 85.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Tin | 7440-31-5 | 0.01 | mg/L | <0.01 | 1 mg/L | 97.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Vanadium | 7440-62-2 | 0.01 | mg/L | <0.01 | 1 mg/L | 93.8 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 0.01 | mg/L | <0.01 | 1 mg/L | 90.0 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: WATER

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | | | | MS | MSD | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations - Filtered (QC Lot: 816733)** | | | | | | | | | | |
| HK0819661-001 | Anonymous | EG020: Antimony | 7440-36-0 | 1 mg/L | 84.2 | 80.5 | 75 | 125 | 4.5 | ---- |
| | | EG020: Arsenic | 7440-38-2 | 1 mg/L | 89.3 | 90.3 | 75 | 125 | 1.1 | ---- |
| | | EG020: Barium | 7440-39-3 | 1 mg/L | 105 | 99.3 | 75 | 125 | 5.8 | ---- |
| | | EG020: Beryllium | 7440-41-7 | 1 mg/L | 86.6 | 89.2 | 75 | 125 | 2.9 | ---- |
| | | EG020: Cadmium | 7440-43-9 | 1 mg/L | 87.0 | 89.1 | 75 | 125 | 2.4 | ---- |
| | | EG020: Chromium | 7440-47-3 | 1 mg/L | 95.8 | 90.9 | 75 | 125 | 5.2 | ---- |
| | | EG020: Copper | 7440-50-8 | 1 mg/L | 90.8 | 87.3 | 75 | 125 | 3.9 | ---- |
| | | EG020: Lead | 7439-92-1 | 1 mg/L | 93.4 | 87.8 | 75 | 125 | 6.2 | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.02 mg/L | 96.1 | 96.6 | 75 | 125 | 0.5 | ---- |
| | | EG020: Nickel | 7440-02-0 | 1 mg/L | 94.9 | 87.9 | 75 | 125 | 7.6 | ---- |
| | | EG020: Selenium | 7782-49-2 | 1 mg/L | 88.8 | 82.5 | 75 | 125 | 7.4 | ---- |
| | | EG020: Silver | 7440-22-4 | 1 mg/L | 78.9 | 77.0 | 75 | 125 | 2.4 | ---- |
| | | EG020: Thallium | 7440-28-0 | 1 mg/L | 80.3 | 85.8 | 75 | 125 | 6.7 | ---- |
| | | EG020: Tin | 7440-31-5 | 1 mg/L | 96.6 | 95.2 | 75 | 125 | 1.5 | ---- |
| | | EG020: Vanadium | 7440-62-2 | 1 mg/L | 94.0 | 92.8 | 75 | 125 | 1.3 | ---- |
| | | EG020: Zinc | 7440-66-6 | 1 mg/L | 87.0 | 84.4 | 75 | 125 | 3.0 | ---- |

# MTR CORPORATION
# EXPRESS RAIL LINK (XRL)
# CONTRACTOR'S SUBMISSION FORM (CSF)

Project Management - XRL Department
4/F MTR Kam Tin Bldg., 23 Kam Ho Road, NT
Tel : (852) 2208-3333 Direct Fax : (852) 2208-3283

| FROM : GEOTECHNICS & CONCRETE ENGINEERING (H.K.) LTD.<br>6 KO SHAN ROAD, GROUND FLOOR,<br>HUNG HOM, KOWLOON | TO : CONSTRUCTION MANAGER<br>CONTRACT NEX/2108<br>MTR CORPORATION<br>HONG KONG | **CSF No.** : NEX2108/SUB/588<br>**FILE REF** :<br>**SIGNED** : P.L. John Fung<br>**DATE** : 06 November 2008 |
|---|---|---|

| DOCUMENT TITLE | * N / R | DOCUMENT NO | SRF / ERF NO | CONTRACTOR'S COMMENTS |
|---|---|---|---|---|
| Preliminary environmental lab test results for drillhole no. 2108/XRL/EDH28 | N | GCE/NEX/2108/2008/S588 | | |

| REGISTRATION | INTERNAL DISTRIBUTION | | | EXTERNAL DISTRIBUTION | | |
|---|---|---|---|---|---|---|
| Receipt date : | | | | | | |
| Registration No : | | | | | | |
| | | | | | | |

*

N = New Submission R = Re-submission

PIMS/PN/11-4/F9.A1

w/encl.

c.c. MTRCL by Fax No. 2208 3283 (Mr. Derek KWOK) DKWOK@mtr.com.hk
SWL by Fax No. 2428 9922 (Mr. Benjamin SUN / Mr. Sam LAM) sam.lam@scottwilson.com.hk
GCE Mr. S.L. HAU / Mr. Tom LO / Mr. Eric YEUNG

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : MASS TRANSIT RAILWAY CORPORATION | Laboratory | : ALS Technichem (HK) Pty Ltd | Page | : 1 of 9 |
| Contact | : MR TOM LO | Contact | : Wong Wai Man, Alice | Work Order | : HK0816621 |
| Address | : 6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG | Address | : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong | Amendment | : 1 |
| E-mail | : tom@gce.com.hk | E-mail | : Alice.Wong@alsenviro.com | | |
| Telephone | : +852 2365 9123 | Telephone | : +852 2610 1044 | | |
| Facsimile | : +852 2765 8034 | Facsimile | : +852 2610 2021 | | |
| Project | : GROUND INVESTIGATION FOR EXPRESS RAIL LINK | Quote number | : ---- | Date Samples Received | : 03-OCT-2008 |
| Order number | : ---- | | | Issue Date | : 04-NOV-2008 |
| C-O-C number | : H005352 | | | 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 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: 18-OCT-2008

Key: LOR = Limit of reporting; CAS Number = Chemistry Abstract Services number

Specific comments for Work Order: **HK0816621**

**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.**

**Sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

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

## Analytical Results

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH28 (0.5M) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: [03-OCT-2008] | | | |
| | | | | HK0816621-001 | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | |
| EA055: Moisture Content (dried @ 103° C) | --- | 0.1 | % | 8.6 | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | |
| EK025: Free Cyanide | --- | 1 | mg/kg | 1 | | | |
| **EG: Metals and Major Cations** | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | 12 | | | |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | 59 | | | |
| EG020: Mercury | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | 14 | | | |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | 124 | | | |
| EG049: Trivalent Chromium | 16065-83-1 | 1 | mg/kg | 4 | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | | | |
| **EP-080: BTEX** | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | <0.2 | | | |
| Toluene | 108-88-3 | 0.2 | mg/kg | <0.2 | | | |
| Chlorobenzene | 108-90-7 | 0.2 | mg/kg | <0.2 | | | |
| Ethylbenzene | 100-41-4 | 0.2 | mg/kg | <0.2 | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 0.4 | mg/kg | <0.4 | | | |
| ortho-Xylene | 95-47-6 | 0.2 | mg/kg | <0.2 | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | |
| C9 - C16 Fraction | --- | 200 | mg/kg | <200 | | | |
| C17 - C35 Fraction | --- | 500 | mg/kg | <500 | | | |
| C6 - C8 Fraction | --- | 5 | mg/kg | <5 | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | | | |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | | | |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | | | |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | | | |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | |
| 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | | | |
| 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | |
| Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | | | |

Sub-Matrix: SEDIMENT

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/EDH28 (0.5M) | Client sampling date / time: [03-OCT-2008] | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | HK0816621-001 | | | | |
| **EP-074E: Halogenated Aliphatics - Continued** | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |
| **EP-075A: Phenols** | | | | | | | | |
| Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | | | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | | | | |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | | | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | | | | |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | | | | |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | | | | |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | | | | |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | | | | |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | | | | |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | | | | |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | | | | |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | | | | |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | 0.2 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | 84.3 | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | 97.6 | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | 105 | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: SEDIMENT | | | | Client sample ID | 2108/XRL/EDH28 (0.5M) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [03-OCT-2008] | | | | |
| Compound | CAS Number | LOR | Unit | | HK0816621-001 | | | | |
| **EP-074S: VOC Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Dibromofluoromethane | 1868-53-7 | 0.1 | % | | 84.3 | | | | |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | 97.6 | | | | |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | 105 | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| 2-Fluorophenol | 367-12-4 | 0.1 | % | | 79.0 | | | | |
| Phenol-d6 | 13127-88-3 | 0.1 | % | | 74.2 | | | | |
| 2.4.6-Tribromophenol | 118-79-6 | 0.1 | % | | 82.8 | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Nitrobenzene -d5 | 4165-60-0 | 0.1 | % | | 75.4 | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.1 | % | | 74.1 | | | | |
| 4-Terphenyl-d14 | 1718-51-0 | 0.1 | % | | 79.2 | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| Tetrachlorometaxylene | 877-09-8 | 0.1 | % | | 118 | | | | |
| Dibutylchlorendate | 1770-80-5 | 0.1 | % | | 117 | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EA/ED: Physical and Aggregate Properties (QC Lot: 780530)** | | | | | | | | |
| HK0816500-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | --- | 0.1 | % | 35.1 | 34.9 | 0.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | |
| HK0815703-001 | Anonymous | EK025: Free Cyanide | --- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 780003)** | | | | | | | | |
| HK0816799-005 | Anonymous | EG020: Cadmium | 7440-43-9 | 0.5 | mg/kg | 1.7 | 1.7 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 0.5 | mg/kg | 197 | 198 | 0.8 |
| | | EG020: Lead | 7439-92-1 | 0.5 | mg/kg | 30.1 | 30.8 | 2.2 |
| | | EG020: Mercury | 7439-97-6 | 0.5 | mg/kg | 0.7 | 0.7 | 0.0 |
| | | EG020: Nickel | 7440-02-0 | 0.5 | mg/kg | 12.2 | 11.0 | 10.8 |
| | | EG020: Zinc | 7440-66-6 | 0.5 | mg/kg | 585 | 606 | 3.4 |
| **EP-080: BTEX (QC Lot: 779506)** | | | | | | | | |
| HK0816621-001 | 2108/XRL/EDH28 (0.5M) | Benzene | 71-43-2 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | Toluene | 108-88-3 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | Chlorobenzene | 108-90-7 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 0.4 | mg/kg | <0.4 | <0.4 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 779505)** | | | | | | | | |
| HK0816621-001 | 2108/XRL/EDH28 (0.5M) | C9 - C16 Fraction | --- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | --- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 779506)** | | | | | | | | |
| HK0816621-001 | 2108/XRL/EDH28 (0.5M) | C6 - C8 Fraction | --- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | LOR | Unit | Laboratory Duplicate (DUP) Report: Original Result | Laboratory Duplicate (DUP) Report: Duplicate Result | Laboratory Duplicate (DUP) Report: RPD (%) |
|---|---|---|---|---|---|---|---|---|
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 773317)** | | | | | | | | |
| HK0815703-001 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Phenol | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Naphthalene | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthylene | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Acenaphthene | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Benzo(b) & Benzo(k)fluoranthene | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Bis(2-ethylhexyl)phthalate | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | |
| HK0815703-001 | Anonymous | Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | |
| HK0815703-001 | Anonymous | Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report: LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%): LCS | Spike Recovery (%): DCS | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 781255)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 9.48 mg/kg | 101 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 780003)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.1 | ---- | 85 | 115 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | Concentration | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 780003) - Continued** | | | | | | | | | | | |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 94.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 92.4 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 114 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 96.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 90.8 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 783452)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <1 | 25 mg/kg | 104 | ---- | 85 | 115 | ---- | ---- |
| **EP-080: BTEX (QC Lot: 779506)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | <0.2 | 0.2 mg/kg | 120 | ---- | 50 | 129 | ---- | ---- |
| Toluene | 108-88-3 | 0.2 | mg/kg | <0.2 | 0.2 mg/kg | # 130 | ---- | 73 | 112 | ---- | ---- |
| Chlorobenzene | 108-90-7 | 0.2 | mg/kg | <0.2 | 0.2 mg/kg | # 137 | ---- | 88 | 120 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.2 | mg/kg | <0.2 | 0.2 mg/kg | # 126 | ---- | 83 | 125 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 0.4 | mg/kg | <0.4 | 0.4 mg/kg | 122 | ---- | 78 | 143 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.2 | mg/kg | <0.2 | 0.2 mg/kg | 121 | ---- | 72 | 140 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 779505)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 89.6 | ---- | 45 | 122 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 103 | ---- | 50 | 111 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 779506)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 98.0 | ---- | 63 | 135 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 773317)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 57 | 144 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 115 | ---- | 66 | 128 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 76 | 134 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 108 | ---- | 69 | 142 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 126 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 72 | 139 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 773317)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 109 | ---- | 16 | 138 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 773317)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 65 | 134 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 128 | ---- | 74 | 128 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 773317)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 95.8 | ---- | 59 | 145 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 96.1 | ---- | 59 | 142 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 773321)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 76.7 | ---- | 49 | 103 | ---- | ---- |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | Spike Recovery (%) DCS | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 773321)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.5 | ---- | 61 | 101 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 64.1 | ---- | 56 | 104 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.2 | ---- | 63 | 104 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 72.9 | ---- | 65 | 106 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 70.0 | ---- | 66 | 103 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 65.9 | ---- | 66 | 98 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 68.4 | ---- | 69 | 106 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | # 67.6 | ---- | 68 | 106 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.8 | ---- | 57 | 109 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 67.2 | ---- | 66 | 109 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 81.4 | ---- | 72 | 104 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 66.7 | ---- | 60 | 104 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 84.8 | ---- | 63 | 111 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 85.2 | ---- | 64 | 111 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.0 | ---- | 68 | 112 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 773321)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 75.4 | ---- | 68 | 109 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 773320)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 126 | ---- | 56 | 141 | ---- | ---- |

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

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | Spike Recovery (%) MSD | Recovery Limits (%) Low | Recovery Limits (%) High | RPD (%) Value | RPD (%) Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 780003)** | | | | | | | | | | |
| HK0816608-008 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 93.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | 88.5 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 87.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 82.3 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 783452)** | | | | | | | | | | |
| HK0816621-001 | 2108/XRL/EDH28 (0.5M) | EG3060: Hexavalent Chromium | 18540-29-9 | 25 mg/kg | 111 | ---- | 75 | 125 | ---- | ---- |

## Surrogate Control Limits

| Sub-Matrix: SEDIMENT | | Recovery Limits (%) | |
|---|---|---|---|
| Compound | CAS Number | Low | High |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| Dibromofluoromethane | 1868-53-7 | 80 | 120 |
| Toluene-D8 | 2037-26-5 | 81 | 117 |
| 4-Bromofluorobenzene | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| Tetrachlorometaxylene | 877-09-8 | 50 | 130 |
| Dibutylchlorendate | 1770-80-5 | 50 | 130 |

**Landfill**

**(2108/XRL/A4a to 2108/XRL/A4b)**

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem HK Pty Ltd** | Page | : **1 of 10** |
| Contact | : **MR TOM LO** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0908751** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **tom@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **05-MAY-2009** |
| Order number | : **----** | | | Issue Date | : **16-MAY-2009** |
| C-O-C number | : **H004753** | | | 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 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: 15-MAY-2009

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: **HK0908751**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98. Extraction Fluid #2 pH 2.83 - 2.93.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/A4a (48.35-48.72M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 05-MAY-2009 11:00 | | | | |
| | | | | HK0908751-001 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **24.6** | | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | **0.3** | | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **33** | | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **12** | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **5** | | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **381** | | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **11** | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |

| Sub-Matrix: SOIL | | | Client sample ID | 2108/XRL/A4a (48.35-48.72M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 05-MAY-2009 11:00 | | | | |
| Compound | CAS Number | LOR | Unit | HK0908751-001 | | | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **94.0** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **96.9** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **108** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **94.0** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **96.9** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **108** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **61.8** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **56.3** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **55.3** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | | Surrogate control limits listed at end of this report. |

| Sub-Matrix: **SOIL** | | | | *Client sample ID* | **2108/XRL/A4a (48.35-48.72M)** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 05-MAY-2009 11:00 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0908751-001** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | | **69.2** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | | **60.3** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | | **65.6** | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | | **97.6** | | | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | | **96.9** | | | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | *Client sample ID* | **2108/XRL/A4a (48.35-48.72M)** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | *Client sampling date / time* | 05-MAY-2009 12:00 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | | **HK0908751-001** | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.2 | mg/L | | <0.2 | | | | |
| **Sample Preparation Method** | | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | | **1** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 974145)** | | | | | | | | |
| HK0908745-001 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 13.0 | 12.5 | 3.6 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 975079)** | | | | | | | | |
| HK0908746-004 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 975634)** | | | | | | | | |
| HK0908340-002 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 4 | 6 | 24.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 16 | 18 | 11.7 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 5 | 5 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 33 | 40 | 19.2 |
| HK0908745-006 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | 0.26 | 0.26 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 14 | 16 | 9.6 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 54 | 47 | 12.5 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 3 | 4 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 79 | 89 | 11.9 |
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | |
| HK0908260-001 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | |
| HK0907747-004 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | |
| HK0907747-004 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075A: Phenols (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 968940)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EG: Metals and Major Cations - Filtered (QC Lot: 979962)** | | | | | | | | |
| HK0908340-001 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 0.0 |
| HK0908751-001 | 2108/XRL/A4a (48.35-48.72M) | **EG036: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | <0.2 | 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 |
|---|---|

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 975079)** | | | | | | | | | | | |
| EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 10 mg/kg | 110 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 975634)** | | | | | | | | | | | |
| EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 89.3 | ---- | 85 | 115 | ---- | ---- |
| EG020: Copper | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 90.1 | ---- | 85 | 115 | ---- | ---- |
| EG020: Lead | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 98.0 | ---- | 85 | 115 | ---- | ---- |
| EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 102 | ---- | 85 | 115 | ---- | ---- |
| EG020: Nickel | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 89.7 | ---- | 85 | 115 | ---- | ---- |
| EG020: Zinc | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 92.6 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 110 | ---- | 41 | 140 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 63.8 | ---- | 47 | 112 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 64.1 | ---- | 43 | 109 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 968938)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 69 | 141 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.1 | ---- | 68 | 149 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.5 | ---- | 77 | 137 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 62 | 160 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 79 | 136 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.2 | ---- | 71 | 149 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 968938)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ---- | 5.0 mg/kg | 94.4 | ---- | 26 | 177 | ---- | ---- |
| | | | | <5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 968938)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 74 | 136 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 151 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 968938)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 69 | 139 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 71 | 137 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 968941)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.2 | ---- | 55 | 100 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 68 | 104 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.6 | ---- | 72 | 108 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941) - Continued** | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 73 | 107 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 77 | 108 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.8 | ---- | 75 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.0 | ---- | 72 | 114 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.2 | ---- | 74 | 113 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.7 | ---- | 75 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 77 | 107 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.1 | ---- | 84 | 104 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 88.2 | ---- | 74 | 101 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.9 | ---- | 66 | 101 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 65 | 110 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.0 | ---- | 73 | 95 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.4 | ---- | 71 | 97 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 968941)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 93.8 | ---- | 82 | 104 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 968940)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 123 | ---- | 71 | 135 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 979962)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.00005 | mg/L | <0.2 | 0.0002 mg/L | 94.0 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 975634)** | | | | | | | | | | |
| HK0908340-001 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 84.4 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | 82.8 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 86.9 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 92.3 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | | | |
| HK0907747-004 | Anonymous | **EG3060: Hexavalent Chromium** | 18540-29-9 | 2.5 mg/kg | 110 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | | | |
| HK0908260-001 | Anonymous | **C6 - C8 Fraction** | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | | | |
| HK0908260-001 | Anonymous | **C9 - C16 Fraction** | ---- | 31 mg/kg | 67.2 | ---- | 50 | 130 | ---- | ---- |
| | | **C17 - C35 Fraction** | ---- | 75 mg/kg | 77.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 979962)** | | | | | | | | | | |
| HK0908340-001 | Anonymous | **EG036: Mercury** | 7439-97-6 | 0.0002 mg/L | 95.0 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |

# CERTIFICATE OF ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Client | : **MASS TRANSIT RAILWAY CORPORATION** | Laboratory | : **ALS Technichem HK Pty Ltd** | Page | : **1 of 10** |
| Contact | : **MR JOHN FUNG** | Contact | : **Wong Wai Man, Alice** | **Work Order** | : **HK0908260** |
| Address | : **6 KO SHAN ROAD, GROUND FLOOR, HUNG HOM, KOWLOON, HONG KONG** | Address | : **11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong** | | |
| E-mail | : **si@gce.com.hk** | E-mail | : **Alice.Wong@alsenviro.com** | | |
| Telephone | : **+852 2365 9123** | Telephone | : **+852 2610 1044** | | |
| Facsimile | : **+852 2765 8034** | Facsimile | : **+852 2610 2021** | | |
| Project | : **GROUND INVESTIGATION FOR EXPRESS RAIL LINK** | Quote number | : **----** | Date Samples Received | : **24-APR-2009** |
| Order number | : **----** | | | Issue Date | : **15-MAY-2009** |
| C-O-C number | : **H004749** | | | No. of samples received | : **2** |
| 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 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: 14-MAY-2009

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: **HK0908260**

**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.**

**Soil sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.**

**The metal concentrations reported are those determined on the TCLP leachate. Extraction Fluid #1 pH 4.88 - 4.98. Extraction Fluid #2 pH 2.83 - 2.93.**

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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** | **Senior Chemist** | **Organics** |
| **Fung Lim Chee, Richard** | **General Manager** | **Inorganics** |

## Analytical Results

Sub-Matrix: **SOIL**

| Compound | CAS Number | LOR | Unit | Client sample ID: 2108/XRL/A4b (36.70-37.15M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time: 24-APR-2009 11:00 | | | | |
| | | | | HK0908260-001 | | | | |
| **EA/ED: Physical and Aggregate Properties** | | | | | | | | |
| **EA055: Moisture Content (dried @ 103° C)** | ---- | 0.1 | % | **27.0** | | | | |
| **ED/EK: Inorganic Nonmetallic Parameters** | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | | | | |
| **EG: Metals and Major Cations** | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | **0.3** | | | | |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | **42** | | | | |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | **50** | | | | |
| **EG020: Mercury** | 7439-97-6 | 0.2 | mg/kg | <0.2 | | | | |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | **7** | | | | |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | **641** | | | | |
| **EG049: Trivalent Chromium** | 16065-83-1 | 1 | mg/kg | **11** | | | | |
| **EG3060: Hexavalent Chromium** | 18540-29-9 | 1 | mg/kg | <1 | | | | |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH)** | | | | | | | | |
| **C6 - C8 Fraction** | ---- | 5 | mg/kg | <5 | | | | |
| **C9 - C16 Fraction** | ---- | 200 | mg/kg | <200 | | | | |
| **C17 - C35 Fraction** | ---- | 500 | mg/kg | <500 | | | | |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH)** | | | | | | | | |
| **Benzene** | 71-43-2 | 0.5 | mg/kg | <0.5 | | | | |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | <0.5 | | | | |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | | | | |
| **Styrene** | 100-42-5 | 0.5 | mg/kg | <0.5 | | | | |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074B: Oxygenated Compounds** | | | | | | | | |
| **2-Propanone (Acetone)** | 67-64-1 | 5 | mg/kg | <5 | | | | |
| **2-Butanone (MEK)** | 78-93-3 | 5 | mg/kg | <5 | | | | |
| **EP-074E: Halogenated Aliphatics** | | | | | | | | |
| **Methylene chloride** | 75-09-2 | 5 | mg/kg | <5 | | | | |
| **Trichloroethene** | 79-01-6 | 0.5 | mg/kg | <0.5 | | | | |
| **Tetrachloroethene** | 127-18-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074G: Trihalomethanes (THM)** | | | | | | | | |
| **Chloroform** | 67-66-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Bromodichloromethane** | 75-27-4 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-074L: Methyl-tert-butyl Ether** | | | | | | | | |
| **Methyl tert-Butyl Ether (MTBE)** | 1634-04-4 | 5.0 | mg/kg | <5.0 | | | | |

| Sub-Matrix: SOIL | | | Client sample ID | 2108/XRL/A4b (36.70-37.15M) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 24-APR-2009 11:00 | | | | |
| Compound | CAS Number | LOR | Unit | HK0908260-001 | | | | |
| **EP-075A: Phenols** | | | | | | | | |
| **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs)** | | | | | | | | |
| **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | | | | |
| **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | | | | |
| **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | | | | |
| **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | | | | |
| **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | | | | |
| **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | | | | |
| **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2 207-08-9 | 1.0 | mg/kg | <1.0 | | | | |
| **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | | | | |
| **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | | | | |
| **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | | | | |
| **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | | | | |
| **EP-075C: Phthalate Esters** | | | | | | | | |
| **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | | | | |
| **EP-075G: Chlorinated Hydrocarbons** | | | | | | | | |
| **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | | | | |
| **EP-066: Polychlorinated Biphenyls** | | | | | | | | |
| **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | | | | |
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **100** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **103** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **96.6** | | | | |
| **EP-074S: VOC Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| **Dibromofluoromethane** | 1868-53-7 | 0.1 | % | **100** | | | | |
| **Toluene-D8** | 2037-26-5 | 0.1 | % | **103** | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.1 | % | **96.6** | | | | |
| **EP-075S: Acid Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |
| **2-Fluorophenol** | 367-12-4 | 0.1 | % | **76.3** | | | | |
| **Phenol-d6** | 13127-88-3 | 0.1 | % | **73.6** | | | | |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.1 | % | **78.0** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates** | | | | | | | Surrogate control limits listed at end of this report. | |

| Sub-Matrix: **SOIL** | | | *Client sample ID* | **2108/XRL/A4b (36.70-37.15M)** | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sampling date / time* | 24-APR-2009 11:00 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0908260-001** | | | | |
| **EP-075T: Base/Neutral Extractable Surrogates - Continued** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Nitrobenzene -d5** | 4165-60-0 | 0.1 | % | **79.8** | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.1 | % | **83.1** | | | | |
| **4-Terphenyl-d14** | 1718-51-0 | 0.1 | % | **88.0** | | | | |
| **EP-066S: PCB Surrogate** | | | | | | | | Surrogate control limits listed at end of this report. |
| **Tetrachlorometaxylene** | 877-09-8 | 0.1 | % | **115** | | | | |
| **Dibutylchlorendate** | 1770-80-5 | 0.1 | % | **126** | | | | |

| Sub-Matrix: **TCLP LEACHATE** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | *Client sample ID* | **2108/XRL/A4b (36.70-37.15M)** | | | | |
| | | | *Client sampling date / time* | 24-APR-2009 12:00 | | | | |
| *Compound* | *CAS Number* | *LOR* | *Unit* | **HK0908260-001** | | | | |
| **EG: Metals and Major Cations - Filtered** | | | | | | | | |
| **EG036: Mercury** | 7439-97-6 | 0.2 | mg/L | <0.2 | | | | |
| **Sample Preparation Method** | | | | | | | | |
| **E-TCLP: Extraction Fluid Number** | ---- | - | -- | **1** | | | | |

## Laboratory Duplicate (DUP) Report

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EA/ED: Physical and Aggregate Properties (QC Lot: 969614)** | | | | | | | | |
| HK0907747-004 | Anonymous | EA055: Moisture Content (dried @ 103°C) | ---- | 0.1 | % | 29.4 | 29.8 | 1.5 |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 970581)** | | | | | | | | |
| HK0907747-004 | Anonymous | EK025: Free Cyanide | ---- | 1 | mg/kg | <1 | <1 | 0.0 |
| **EG: Metals and Major Cations (QC Lot: 971225)** | | | | | | | | |
| HK0908226-001 | Anonymous | EG020: Mercury | 7439-97-6 | 0.05 | mg/kg | <0.05 | <0.05 | 0.0 |
| | | EG020: Cadmium | 7440-43-9 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| | | EG020: Copper | 7440-50-8 | 1 | mg/kg | 8 | 8 | 0.0 |
| | | EG020: Lead | 7439-92-1 | 1 | mg/kg | 26 | 25 | 6.1 |
| | | EG020: Nickel | 7440-02-0 | 1 | mg/kg | 4 | 3 | 0.0 |
| | | EG020: Zinc | 7440-66-6 | 1 | mg/kg | 118 | 109 | 8.3 |
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | |
| HK0908260-001 | 2108/XRL/A4b (36.70-37.15M) | EG3060: Hexavalent Chromium | 18540-29-9 | 1 | mg/kg | <1 | <1 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | |
| HK0907747-004 | Anonymous | C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | |
| HK0907747-004 | Anonymous | C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | <200 | 0.0 |
| | | C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | <500 | 0.0 |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | meta- & para-Xylene | 108-38-3<br>106-42-3 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-074B: Oxygenated Compounds (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | 2-Propanone (Acetone) | 67-64-1 | 5 | mg/kg | <5 | <5 | 0.0 |
| | | 2-Butanone (MEK) | 78-93-3 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074E: Halogenated Aliphatics (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Methylene chloride | 75-09-2 | 5 | mg/kg | <5 | <5 | 0.0 |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-074L: Methyl-tert-butyl Ether (QC Lot: 968938)** | | | | | | | | |
| HK0907747-004 | Anonymous | Methyl tert-Butyl Ether (MTBE) | 1634-04-4 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |

Matrix: SOIL

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Laboratory Duplicate (DUP) Report | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LOR | Unit | Original Result | Duplicate Result | RPD (%) |
| **EP-075A: Phenols (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Phenol** | 108-95-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Naphthalene** | 91-20-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthylene** | 208-96-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Acenaphthene** | 83-32-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluorene** | 86-73-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Phenanthrene** | 85-01-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Anthracene** | 120-12-7 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Fluoranthene** | 206-44-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Pyrene** | 129-00-0 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benz(a)anthracene** | 56-55-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Chrysene** | 218-01-9 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(a)pyrene** | 50-32-8 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Indeno(1.2.3.cd)pyrene** | 193-39-5 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Dibenz(a.h)anthracene** | 53-70-3 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(g.h.i)perylene** | 191-24-2 | 0.5 | mg/kg | <0.5 | <0.5 | 0.0 |
| | | **Benzo(b) & Benzo(k)fluoranthene** | 205-99-2<br>207-08-9 | 1.0 | mg/kg | <1.0 | <1.0 | 0.0 |
| **EP-075C: Phthalate Esters (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Bis(2-ethylhexyl)phthalate** | 117-81-7 | 5.0 | mg/kg | <5.0 | <5.0 | 0.0 |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 968941)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Hexachlorobenzene (HCB)** | 118-74-1 | 0.2 | mg/kg | <0.2 | <0.2 | 0.0 |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 968940)** | | | | | | | | |
| HK0907747-004 | Anonymous | **Total Polychlorinated biphenyls** | ---- | 0.1 | mg/kg | <0.1 | <0.1 | 0.0 |

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

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 970581)** | | | | | | | | | | | |
| **EK025: Free Cyanide** | ---- | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | | ---- | 10 mg/kg | 99.0 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 971225)** | | | | | | | | | | | |
| **EG020: Cadmium** | 7440-43-9 | 0.2 | mg/kg | <0.2 | 5 mg/kg | 91.4 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Copper** | 7440-50-8 | 1 | mg/kg | <1 | 5 mg/kg | 97.9 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Lead** | 7439-92-1 | 1 | mg/kg | <1 | 5 mg/kg | 88.6 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Mercury** | 7439-97-6 | 0.05 | mg/kg | <0.05 | 0.1 mg/kg | 99.2 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Nickel** | 7440-02-0 | 1 | mg/kg | <1 | 5 mg/kg | 94.0 | ---- | 85 | 115 | ---- | ---- |
| **EG020: Zinc** | 7440-66-6 | 1 | mg/kg | <1 | 5 mg/kg | 99.4 | ---- | 85 | 115 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | | | | |

Matrix: SOIL

| Method: Compound | CAS Number | Method Blank (MB) Report | | | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike Concentration | Spike Recovery (%) | | Recovery Limits (%) | | RPD (%) | |
| | | LOR | Unit | Result | | LCS | DCS | Low | High | Value | Control Limit |
| **EG: Metals and Major Cations (QC Lot: 975636) - Continued** | | | | | | | | | | | |
| EG3060: Hexavalent Chromium | 18540-29-9 | 0.5 | mg/kg | <0.5 | 2.5 mg/kg | 108 | ---- | 85 | 115 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | | | | |
| C6 - C8 Fraction | ---- | 5 | mg/kg | <5 | 3 mg/kg | 110 | ---- | 41 | 140 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | | | | |
| C9 - C16 Fraction | ---- | 200 | mg/kg | <200 | 31 mg/kg | 63.8 | ---- | 47 | 112 | ---- | ---- |
| C17 - C35 Fraction | ---- | 500 | mg/kg | <500 | 75 mg/kg | 64.1 | ---- | 43 | 109 | ---- | ---- |
| **EP-074A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 968938)** | | | | | | | | | | | |
| Benzene | 71-43-2 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 114 | ---- | 69 | 141 | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 99.1 | ---- | 68 | 149 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 98.5 | ---- | 77 | 137 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 1.0 | mg/kg | <1.0 | 1.0 mg/kg | 98.4 | ---- | 62 | 160 | ---- | ---- |
| Styrene | 100-42-5 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 107 | ---- | 79 | 136 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 97.2 | ---- | 71 | 149 | ---- | ---- |
| **EP-074B: Oxygenated Compounds (QC Lot: 968938)** | | | | | | | | | | | |
| 2-Butanone (MEK) | 78-93-3 | 5.0 | mg/kg | ----<br><5 | 5.0 mg/kg<br>---- | 94.4<br>---- | ----<br>---- | 26<br>---- | 177<br>---- | ----<br>---- | ----<br>---- |
| **EP-074E: Halogenated Aliphatics (QC Lot: 968938)** | | | | | | | | | | | |
| Trichloroethene | 79-01-6 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 109 | ---- | 74 | 136 | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 104 | ---- | 69 | 151 | ---- | ---- |
| **EP-074G: Trihalomethanes (THM) (QC Lot: 968938)** | | | | | | | | | | | |
| Chloroform | 67-66-3 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 118 | ---- | 69 | 139 | ---- | ---- |
| Bromodichloromethane | 75-27-4 | 0.5 | mg/kg | <0.5 | 0.5 mg/kg | 112 | ---- | 71 | 137 | ---- | ---- |
| **EP-075A: Phenols (QC Lot: 968941)** | | | | | | | | | | | |
| Phenol | 108-95-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.2 | ---- | 55 | 100 | ---- | ---- |
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941)** | | | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 87.2 | ---- | 68 | 104 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.6 | ---- | 72 | 108 | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.3 | ---- | 73 | 107 | ---- | ---- |
| Fluorene | 86-73-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 91.9 | ---- | 77 | 108 | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.8 | ---- | 75 | 112 | ---- | ---- |
| Anthracene | 120-12-7 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.0 | ---- | 72 | 114 | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.2 | ---- | 74 | 113 | ---- | ---- |
| Pyrene | 129-00-0 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 97.7 | ---- | 75 | 113 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 96.9 | ---- | 77 | 107 | ---- | ---- |
| Chrysene | 218-01-9 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 95.1 | ---- | 84 | 104 | ---- | ---- |
| Benzo(b) & Benzo(k)fluoranthene | 205-99-2 207-08-9 | 0.2 | mg/kg | <0.2 | 0.50 mg/kg | 88.2 | ---- | 74 | 101 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 86.9 | ---- | 66 | 101 | ---- | ---- |

Matrix: **SOIL**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EP-075B: Polyaromatic Hydrocarbons (PAHs) (QC Lot: 968941) - Continued** | | | | | | | | | | | |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 99.6 | ---- | 65 | 110 | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 83.0 | ---- | 73 | 95 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.1 | mg/kg | <0.1 | 0.25 mg/kg | 81.4 | ---- | 71 | 97 | ---- | ---- |
| **EP-075G: Chlorinated Hydrocarbons (QC Lot: 968941)** | | | | | | | | | | | |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.2 | mg/kg | <0.2 | 0.25 mg/kg | 93.8 | ---- | 82 | 104 | ---- | ---- |
| **EP-066: Polychlorinated Biphenyls (QC Lot: 968940)** | | | | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | 0.5 mg/kg | 123 | ---- | 71 | 135 | ---- | ---- |

Matrix: **WATER**

| Method: Compound | CAS Number | Method Blank (MB) Report LOR | Unit | Result | Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration | Spike Recovery (%) LCS | DCS | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 972838)** | | | | | | | | | | | |
| EG036: Mercury | 7439-97-6 | 0.00005 | mg/L | <0.2 | 0.0002 mg/L | 100 | ---- | 85 | 115 | ---- | ---- |

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

Matrix: **SOIL**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%) MS | MSD | Recovery Limits (%) Low | High | RPD (%) Value | Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations (QC Lot: 971225)** | | | | | | | | | | |
| HK0907747-004 | Anonymous | EG020: Cadmium | 7440-43-9 | 5 mg/kg | 90.3 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Copper | 7440-50-8 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Lead | 7439-92-1 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Mercury | 7439-97-6 | 0.1 mg/kg | 108 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Nickel | 7440-02-0 | 5 mg/kg | 92.7 | ---- | 75 | 125 | ---- | ---- |
| | | EG020: Zinc | 7440-66-6 | 5 mg/kg | # Not Determined | ---- | 75 | 125 | ---- | ---- |
| **EG: Metals and Major Cations (QC Lot: 975636)** | | | | | | | | | | |
| HK0907747-004 | Anonymous | EG3060: Hexavalent Chromium | 18540-29-9 | 2.5 mg/kg | 110 | ---- | 75 | 125 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968939)** | | | | | | | | | | |
| HK0908260-001 | 2108/XRL/A4b (36.70-37.15M) | C6 - C8 Fraction | ---- | 3 mg/kg | 102 | ---- | 50 | 130 | ---- | ---- |
| **EP-071HK: Total Petroleum Hydrocarbons (TPH) (QC Lot: 968942)** | | | | | | | | | | |
| HK0908260-001 | 2108/XRL/A4b (36.70-37.15M) | C9 - C16 Fraction | ---- | 31 mg/kg | 67.2 | ---- | 50 | 130 | ---- | ---- |
| | | C17 - C35 Fraction | ---- | 75 mg/kg | 77.9 | ---- | 50 | 130 | ---- | ---- |

Matrix: **WATER**

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

Matrix: **WATER**

| Laboratory sample ID | Client sample ID | Method: Compound | CAS Number | Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration | Spike Recovery (%): MS | Spike Recovery (%): MSD | Recovery Limits (%): Low | Recovery Limits (%): High | RPD (%): Value | RPD (%): Control Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **EG: Metals and Major Cations - Filtered (QC Lot: 972838)** | | | | | | | | | | |
| HK0908260-001 | 2108/XRL/A4b (36.70-37.15M) | **EG036: Mercury** | 7439-97-6 | 0.0002 mg/L | 105 | ---- | 75 | 125 | ---- | ---- |

## *Surrogate Control Limits*

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%): Low | Recovery Limits (%): High |
|---|---|---|---|
| **EP-080S: TPH(Volatile)/BTEX Surrogate** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **EP-074S: VOC Surrogates** | | | |
| **Dibromofluoromethane** | 1868-53-7 | 80 | 120 |
| **Toluene-D8** | 2037-26-5 | 81 | 117 |
| **4-Bromofluorobenzene** | 460-00-4 | 74 | 121 |
| **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 |
| **EP-066S: PCB Surrogate** | | | |
| **Tetrachlorometaxylene** | 877-09-8 | 50 | 130 |
| **Dibutylchlorendate** | 1770-80-5 | 50 | 130 |