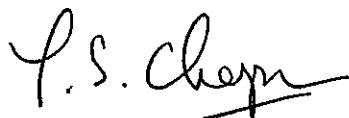


MTR Corporation Limited

**Shatin to Central Link
Tai Wai to Hung Hom Section**

**Supplementary Contamination Assessment
Report for New Territories
South Animal Centre**



Verified by: Tom Chapman

Position: Independent Environmental Checker

Date: 28 September 2012

MTR Corporation Limited

**Shatin to Central Link
Tai Wai to Hung Hom Section**

Supplementary Contamination Assessment
Report for New Territories
South Animal Centre

Certified by: Richard Kwan 

Position: Environmental Team Leader



Date: 28 September 2012

MTR Corporation Limited

Consultancy Agreement No. C11033

**Shatin to Central Link – Tai Wai to Hung
Hom Section
[SCL (TAW-HUH)]****Supplementary Contamination Assessment
Report for New Territories South Animal
Centre**

September 2012

	Name	Signature
Prepared & Checked:	David Paton	
Reviewed & Approved:	Josh Lam	

Version: A Date: 27 September 2011

Disclaimer

This Contamination Assessment Report is prepared for MTR Corporation Limited (MTRC) and is given for its sole benefit in relation to and pursuant to Consultancy Agreement No. C11033 and may not be disclosed to, quoted to or relied upon by any person other than MTRC without our prior written consent. No person (other than MTRC) into whose possession a copy of this report comes may rely on this report without our express written consent and MTRC may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.
15/F, Tower 1, Grand Central Plaza, 138 Shatin Rural Committee Road, Shatin, New Territories,
Hong Kong
Tel: (852) 3922 9362 Fax: (852) 2891 0305 www.aecom.com

Table of Contents

	Page
1 INTRODUCTION	2
1.1 Background information.....	2
1.2 Objectives	2
2 FINDINGS OF PREVIOUS LAND CONTAMINATION ASSESSMENT.....	3
3 CONTAMINATION ASSESSMENT REPORT	4
3.1 Assessment Methodology.....	4
3.2 Assessment Criteria	5
3.3 Analytical Results and Interpretation.....	6
4 CONCLUSION.....	7

List of Tables

Table 2.1	Potential Contaminative Land uses within Site L1
Table 3.1	Sampling Locations
Table 3.2	Relevant RBRGs for Soil and Groundwater - Industrial

List of Figures

C11033/C/SCL/ACM/M57/001 As-built Sampling Location

Appendices

Appendix A	Sampling and Testing Requirement Proposed in the endorsed CAP
Appendix B	Site Boring Log
Appendix C	Chain of Custody (COC) documents
Appendix D	Laboratory Result Summary and Certificates of Analysis
Appendix E	Standard Forms 3.2 and 3.4 – Soil Data Summary and Comparison to RBRGs and C_{sat}

1 INTRODUCTION

1.1 Background

- 1.1.1 Shatin to Central Link – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] (hereinafter known as “the Project”), is an approximately 11 km long extension of the Ma On Shan Line (MOL) which connects the existing West Rail Line (WRL) at Hung Hom, forming a strategic east-west rail corridor.
- 1.1.2 The EIA Report for SCL (TAW-HUH) (Register No.: AEIAR-167/2012) were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012 (EP No: EP-438/2012) for the construction and operation of the SCL (TAW-HUH). Variations of environmental permit (VEP) was subsequently applied and the latest EP (EP No: EP-438/2012/A) was issued by Director of Environmental Protection (DEP) on 12 July 2012.
- 1.1.3 During the time of the SCL (TAW-HUH) EIA study, New Territories South Animal Centre (Site L1) located at Hin Keng Station (HIK) was identified as an area with potential land contamination concerns. The location of Site L1 is shown in **Figure C11033/C/SCL/ACM/M57/001**. Land Contamination Assessment including Contamination Assessment Plan (CAP), Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) for Site L1 has been prepared and documented in the SCL (TAW-HUH) EIA Report. However, as mentioned in Section 3.1 of the endorsed CAR, the testing of cyanide (free) was missed for the soil samples collected from this site.
- 1.1.4 Pursuant to EP Condition 2.23, Supplementary Land Contamination Assessment (SLCA) for Site L1 for soil sampling and analysis of cyanide (free) shall be carried out and a Contamination Assessment Report (CAR) to document the SLCA findings should be submitted for approval. If land contamination is confirmed, a Remedial Action Plan (RAP) to formulate necessary remedial measures should also be submitted for approval.

1.2 Objectives

- 1.2.1 As per EP Condition 2.23, SLCA has been carried out for Site L1 for soil sampling and analysis of cyanide (free). This Supplementary CAR is prepared to document the findings of SLCA (including fieldworks and laboratory analyses).

2 FINDINGS OF PREVIOUS LAND CONTAMINATION ASSESSMENT

- 2.1.1 According to the endorsed CAP, the potential land contaminative activities identified at Site L1 are summarized in **Table 2.1**. The sampling requirements are extracted and provided in **Appendix A**. It was proposed that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, Total Petroleum hydrocarbon (TPH) and free cyanide should be analysed for.

Table 2.1 Potential Contaminative Land uses within Site L1

Potential Contaminative Area	Potential Contamination Impact
Store room for chemical	<ul style="list-style-type: none">Possible spillage/leakage of chemicals

- 2.1.2 Soil samples were collected from Site L1 at depth 0.5m, 1.5m, 3.0m, 6.0m and 9.0m below ground (blg), and were analyzed for all soil parameters except free cyanide. Groundwater was also collected and analyzed for all groundwater parameters.
- 2.1.3 Based on the findings of the endorsed CAR, all results from Site L1 indicated that soil/groundwater samples are below RBRGs for industrial land use. However, no samples were analyzed for free cyanide therefore the SLCA is required to report sampling and analysis of free cyanide at Site L1 as stated in EP Condition 2.23.

3 CONTAMINATION ASSESSMENT REPORT

3.1 Assessment Methodology

Soil Boring and Sampling

- 3.1.1 Additional SI works for Site L1 were carried out during the period 23 May to 26 May 2011 for the purpose of the SLCA. The site investigation, comprising rotary drilling of boreholes, excavation of trial pits, logging of ground materials and reinstatement of excavations was conducted by DrillTech Ground Engineering Limited under the supervision of MTR Corporation Limited (MTR). Laboratory analyses were carried out by ALS Technichem (HK) Pty Limited (ALS HK).
- 3.1.2 A single borehole has been constructed within Site L1 with a total of 8 soil samples (including duplicates) collected. Sampling details are summarized in **Table 3.1** below. The as-built sampling location is within 10m from the location proposed in the endorsed CAP and is shown in **Figure C11033/C/SCL/ACM/M57/001**.

Table 3.1 Sampling Locations

Sampling ID	Co-ordinates		Deviation from proposed location in CAP (m)
	Easting	Northing	
<i>Proposed Sampling ID and Coordinate in endorsed CAP</i>			
2209/SCL/EDH001(P)	835662.83	824942.49	NA
<i>As-Built Sampling ID and Coordinate in endorsed CAR</i>			
2209/SCL/EDH001(P)	835664.56	824947.53	5.3
<i>As-Built Sampling ID and Coordinate in this SLCA</i>			
11203/SCL/EB179	835664.85	824948.42	3.6

- 3.1.3 According to Section 6 of the endorsed CAP, soil samples were proposed to be collected at depths of 0.5m, 1.5m, 3m and then at 3m intervals to the termination level for environmental sampling. The proposed termination level for environmental sampling at Site L1 is 17m blg.
- 3.1.4 At each sampling location prior to drilling/trial pit construction, sampling tools and all equipment in contact with the ground were by high pressure jetting, then washed with phosphate-free detergent and finally rinsed with water.
- 3.1.5 Where an inspection pit was excavated, disturbed samples were proposed to be collected at 0.5m and 1.5m blg and undisturbed samples were proposed collected from all other depths.
- 3.1.6 Unlike the sampling in previous SI, soil samples were collected at 3.0m intervals down to 15.0m. The soil samples collected are 0.5m, 1.5m, 3.0m, 6.0m, 9.0m, 12.0m and 15.0m blg.
- 3.1.7 Soil samples were appropriately labelled, stored in cool boxes at 2°C - 4°C and delivered to laboratory for analysis. Chain of custody (COC) documents are provided in **Appendix C**. ALS HK was appointed to undertake chemical testing of samples collected under the SLCA. All soil samples collected during the SI were analyzed for free cyanide in accordance with the analytical schedules detailed in the endorsed CAP. The results of laboratory analyses are presented in **Appendix D**.

Strata Logging

- 3.1.8 Strata logging for boreholes was undertaken during the course of drilling and sampling by a qualified geologist. The logs included the general stratigraphic descriptions, depth of soil sampling and sample notation. The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics was also recorded. Soil boring logs are provided in **Appendix B**.

Groundwater Sampling

- 3.1.9 Since there is no relevant RBRGs for free cyanide in groundwater, groundwater analysis is not taken into consideration in the SLCA.

3.2 Assessment Criteria

Criteria for Soil and Groundwater Contamination

- 3.2.1 The assessment methodology adopted in this SLCA is in accordance with the *Guidance Note for Contaminated Land Assessment and Remediation* (Guidance Note), *Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management* (Guidance Manual) and *Practice Guide for Investigation and Remediation of Contaminated Land* (PG) issued by the EPD.
- 3.2.2 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.
- 3.2.3 The RBRGs are 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.

- 3.2.4 In addition to the RBRGs, screening criteria (soil saturation limits, Csat, 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.
- 3.2.5 As reviewed in the endorsed CAP, Site L1 will be occupied for railway facilities. According to the Guidance Manual, the corresponding RBRG land use for railway related facilities would be "Industrial". Relevant soil and groundwater RBRGs level for this SLCA including soil saturation limit and solubility limit are presented in **Table 3.2**.

Table 3.2 Relevant RBRGs for Soil and Groundwater - Industrial

Chemical	Soil (mg/kg)		Groundwater (µg/L)	
	RBRGs for Industrial	Soil Saturation Limits	RBRGs for Industrial	Solubility Limits
Other Inorganic Compound				
Cyanide, Free	10,000	NA	NA	NA

Note: NA - Not Available

3.3 Analytical Results and Interpretation

Laboratory Analytical Results

Results of Soil Analysis

- 3.3.1 Based on the soil analysis results, the free cyanide concentration in all samples analyzed was below the laboratory detection limit. No exceedance of RBRG for free cyanide was identified.

Results of Groundwater Analysis

- 3.3.2 Groundwater analysis was not taken into consideration in the SLCA.

Results of QA/QC Analysis

- 3.3.3 QA/QC is the practice of ensuring that sample collection and analytical techniques provide precise and accurate information. This process is undertaken to validate that levels of contamination measured in the environmental samples reflect the actual environmental levels and are not due to accidental contamination of the sample or sample container. Under this SLCA, a duplicate sample, field blank, equipment blank and six trip blank were analyzed.
- 3.3.4 The laboratory results for QA/QC samples are presented in **Appendix D**. All parameters analysed for were not detected in the blank samples. This indicates that the decontamination of equipment during the sampling activities was conducted adequately.
- 3.3.5 In order to assess the sampling and laboratory reproducibility and precision, the relative percent difference (RPD) of the duplicate samples was not determined as both primary and duplicated sample are below reporting limit. Given that the laboratory duplicate, method blank, laboratory control spike, laboratory control spike duplicate, matrix spike and matrix spike duplicate are within the recovery limits. The overall data quality of soil sampling is considered to be acceptable.

4 CONCLUSION

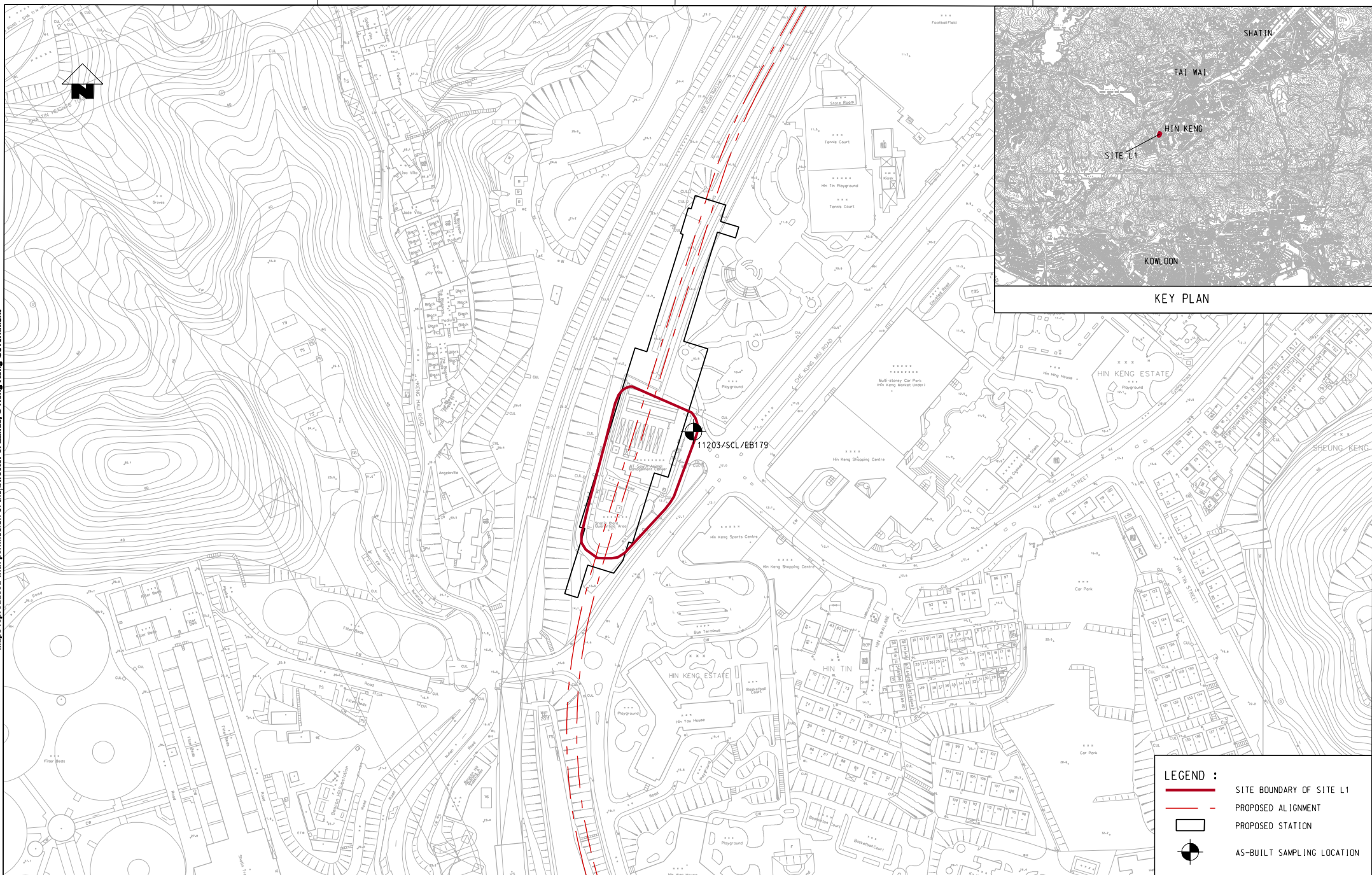
- 4.1.1 Based on the findings of SI conducted from 23 May to 26 May 2011, no detection of free cyanide above the analytical method detection limit was identified. No RBRG or soil saturation exceedances were identified for the industrial land use.
- 4.1.2 According to the Guidance Note, Guidance Manual and PG, the site has no exceedance of RBRGs and therefore remediation is not required.

FIGURE

Maps reproduced with permission of the Director of Lands, © Hong Kong Government

PRINTED BY: BUSSES \$ DATES \$ TIME \$

PLOT DRWG: #PLOTDRWG \$
 MODEL NAME: #MODEL \$
 FILE NAME: #FILE \$



LEGEND :

- SITE BOUNDARY OF SITE L1
- - - PROPOSED ALIGNMENT
- PROPOSED STATION
- AS-BUILT SAMPLING LOCATION

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	RCCP	
DESIGNED	RCCP	
CHECKED	RCCP	
APPROVED	PDA	
DATE	25 / JULY / 2012	ORIGINATOR
AECOM		
SHATIN TO CENTRAL LINK		
<small>DO NOT SCALE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED ON SITE. © THE CORPORATION LIMITED 2008. COPYRIGHT IN RESPECT OF THIS DRAWING ACCORDS TO OWNED BY THE MTR CORPORATION LIMITED OF HONG KONG. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WHETHER MEANS, IS PERMITTED WITHOUT THE PRIOR WRITTEN CONSENT OF THE MTR CORPORATION LIMITED.</small>		
CADD REF.	C11033_C_SCL_ACM_M57_001.dgn	

TITLE		CONSULTANCY AGREEMENT NO. C11033	
		SCL (TAW-HUH)	
		AS-BUILT SAMPLING LOCATION	
SCALE	1 : 2000 (A3)	FIGURE NO.	C11033/C_SCL/ACM/M57/001
REV.		REV.	A

APPENDIX A

**SAMPLING AND TESTING REQUIREMENT PROPOSED IN THE
ENDORSED CAP**

6 Site Investigation

6.1 Proposed Site Investigation

Potentially contaminated sites have been identified in **Section 4** based on desktop study, Preliminary Site Investigation (PSI) and site survey. Further site investigation is required to confirm and quantify the presence of soil and groundwater contamination along SCL. Location of potentially contaminated sites in relation to the SCL alignment boundary, PSI data, construction method and landuse activities has been referenced for the selection of sampling points. Sampling and analysis will be conducted following the EPD's Guidance Note for Contaminated Land Assessment and Remediation. For each of the potentially contaminated sites, 1-2 sampling points closed to the hot spot areas, as far as practicable, have been identified. Taking the relatively heavy industrial activities in the past and large site area into consideration, a total of 15 sampling points was identified at the former Tai Hom Village (L4). Proposed sampling locations and parameters for site investigation are shown in **Table 6.1**.

Sampling depths have been proposed based on the geological profile given in **Appendix A**, and terminated at saprolite level. On-site Land Contamination Specialist will decide the appropriate depths for sampling on a point by point basis.

Sampling locations with the study area of SCL are shown in **Figure 4.1.1-4.1.9**. Sampling parameters for each location are shown in **Table 6.3**.

Table 6.1 Sampling strategy

Site ID	Area (m ²)	Sampling Strategy ⁽¹⁾⁽²⁾					
		Coordinate		Drillhole / Trial Trench No.		Termination Level for Env Sampling (bgl) ⁽³⁾	Sampling Frequency for Analysis
		Easting	Northing	Type	No.		
L1 (Fig 4.1.2)	4,230	835662.83	824942.49	Drillhole	2209/SCL/EDH001(P)	17	Drillhole: Drilling of a borehole and collection of soil samples at depths of 0.5, 1.5 & 3.0, and then at 3.0m intervals to the termination level for environmental sampling. One groundwater sample if encountered. Trial pit: Drilling of trial trenches and collection of soil samples up to 3m deep.
L3 ⁽⁴⁾ (Fig 4.1.2)	3,170	835607.90	824680.02	Trial Trench	2209/SCL/ETT166	3	
		835620.62	824605.38	Trial Trench	2209/SCL/ETT167	3	
L4 (Fig 4.1.4)	69,680	838518.63	822355.77	Drillhole	2209/SCL/EDH028	29	
		838599.03	822323.61	Drillhole	2209/SCL/EDH033	28	
		838602.00	822359.00	Drillhole	2209/SCL/EDH031	28	
		838642.17	822268.38	Drillhole	2209/SCL/EDH125	28	
		838675.00	822287.00	Drillhole	2209/SCL/EDH036	28	
		838697.78	822271.70	Drillhole	2209/SCL/EDH039	28	
		838657.12	822232.69	Drillhole	2209/SCL/EDH038	28	
		838641.06	822241.83	Drillhole	2209/SCL/EDH126	28	
		838749.00	822263.00	Drillhole	2209/SCL/EDH043	28	
		838800.00	822240.00	Drillhole	2209/SCL/EDH042	28	
		838883.53	822209.48	Drillhole	2209/SCL/EDH046(P)	33	
		838879.37	822156.78	Drillhole	2209/SCL/EDH045	30	
838743.14	822189.27	Drillhole	2209/SCL/EDH127	28			
838763.62	822180.97	Drillhole	2209/SCL/EDH128	28			
838676.09	822328.36	Drillhole	2209/SCL/EDH037(P)	28			
L13 (Fig 4.1.7)	860	836801.80	818820.07	Drillhole	2209/SCL/EDH119	23	
L14 (Fig 4.1.7)	360	836818.98	818892.85	Trial Trench	2209/SCL/ETT105	3	

Site ID	Area (m ²)	Sampling Strategy ⁽¹⁾⁽²⁾					Termination Level for Env Sampling (bgl) ⁽³⁾	Sampling Frequency for Analysis
		Coordinate		Drillhole / Trial Trench No.				
		Easting	Northing	Type	No.			
		836827.43	818874.15	Drillhole	2209/SCL/EDH118	22		
L15 (Fig 4.1.6)	1,280	837385.63	819796.74	Drillhole	2209/SCL/EDH252	35		
L16 (Fig 4.1.6)	250	837388.73	819689.06	Drillhole	2209/SCL/EDH253(P)	35		
L17 (Fig 4.1.8)	6,978	836731.12	817957.16	Trail Trench	2209/SCL/ETT068	3		
		836708.88	817918.50	Trail Trench	2209/SCL/ETT106	3		
		836726.23	817947.19	Drillhole	2209/SCL/EDH256	8		
		836726.23	817912.97	Drillhole	2209/SCL/EDH257	8		
SM-1 (Fig 4.1.9)	Approx 100	839650.27	827364.97	Drillhole	EDHSM-1	Refer to Note 3		

- Note:
- (1) Sampling locations are shown in Figures 4.1.1 – 4.1.9.
 - (2) Selection of sampling location referenced to EPD's Guidance Note for Contaminated Land Assessment and Remediation.
 - (3) Exact termination level will be determined by on-site Land Contamination Specialist.
 - (4) Towngas Ltd. confirmed that detail SI would not be allowed within and in the vicinity of the Towngas Offtake Station (Site L3). Therefore, the original proposed 2 drillholes were replaced by 2 trial pits located opposite to the Towngas Offtake Station, and close to Hin Keng Estate. Permission for excavation of these 2 trial pits is still awaited.

6.2 Sampling Strategy

6.2.1 General

The sampling work will be undertaken following appropriate protocols, to minimise the potential for cross-contamination between samples and between different sampling locations. The soil sampling methods are based on techniques developed by USEPA. These methods include decontamination procedures, sample collection, preparation and preservation, and chain-of-custody documentation.

For general land contamination assessments, samples are collected by drillholes as the sampling depth will often exceed 3.0m. This will minimise the chance of cross-contamination between samples that are often observed when using the trial pit method. When conducting the intrusive investigations, care will be taken to avoid underground utilities.

Samples for laboratory testing will be taken with clean stainless steel hand tools and clean latex gloves and placed in rigid containers made of a material that is non-reactive with the likely contaminants.

In addition to the samples collected for laboratory analysis, a strata log will be kept for record of additional data to aid in the interpretation of results. Information on the general structure of the subsurface strata including grain size, colour, and wetness, and the depth and thickness of each soil/rock layer will be noted. The presence of any foreign material such as metals, wood, or plastics is also to be recorded.

All field personnel should wear adequate personal protective equipment when working in contaminated areas.

6.2.2 Decontamination Procedures

Equipment in contact with the ground shall be thoroughly decontaminated between each sampling event to minimize the potential for cross contamination. The equipment shall be decontaminated by steam cleaning, then washed with phosphate-free detergent and finally rinsed with water. Moreover, water shall not be used during drilling.

A clean area immediately adjacent to the sample location should be established, using a clean plastic sheet, on which all cleaned, and foil wrapped equipment may be placed.

During sampling and decontamination activities, disposable latex gloves shall be worn to prevent the transfer of contaminants from other sources. Disposable accessories, such as latex gloves, will be discarded after use.

6.2.3 Soil Sampling

Trial Pit Sampling

Trial pits should be excavated on site for soil and groundwater sampling. Trial pits can be excavated either manually or by an excavator, as judged suitable by the site investigation contractor. Exact location of soil sampling should be determined on site by the on-site Land Contamination Specialist based on observation. The trial pits should be excavated to allow soil samples to be collected at:

- (i) 0.5m below ground;
- (ii) Level immediate above the groundwater level; and
- (iii) Level in between (i) and (ii) above for each sampling point.

Inspection of soil should be made at 0.5m intervals. The depth of the trial pit should be determined by the groundwater level and should be at least 0.5 m below ground level.

Drillhole Sampling

Drilling of borehole and collection of soil samples should be conducted at depths of 0.5m, 1.5m & 3.0m, and then at 3.0m intervals to the base. The on-site Land Contamination Specialist will decide the appropriate depths for sampling on a point by point basis.

Sufficient sample (see **Table 6.2**) should be placed in a pre-cleaned glass sample jar. The jar lid should be covered with laboratory solvent washed aluminium foil and lids. The jar must be filled with no void space (or otherwise if specified by the lab) for samples to be tested for VOCs. Each sample jar should be labelled. Records should be made of the details of the sampling location and other pertinent data. A chain-of-custody form should be completed for the samples. All samples should be stored on ice in portable ice chests between 2 – 4 °C whilst in the field or in transit.

6.2.4 Groundwater Sampling

Groundwater samples shall be collected at each drillhole when groundwater is encountered.

Each sample shall be truly representative of the groundwater at the point from which it is taken, without dilution or contamination by water from other sources or by other material. A groundwater monitoring well shall be installed at each drillhole, and upon completion of installation of monitoring wells, approximately five times volume of well shall be flushed to remove silt and drilling fluid residue from the wells. The wells shall then be allowed to stand for a day to permit groundwater conditions to equilibrate. Groundwater level and thickness of free product layer, if present, shall be measured by dip meter and interface probe respectively, before groundwater samples are taken. Moreover, prior to groundwater sampling, the sampling wells shall be purged (at least three times volumes of well) to remove fine-grained materials and to collect freshly refilled groundwater samples. After purging, one groundwater sample shall then be collected at each sampling well with a Teflon bailer. Field measurement of temperature and pH shall also be taken for each of the samples. The free products, if present, shall also be sampled to allow identification by the laboratory. Typical details of proposed groundwater monitoring well is shown in **Appendix G**.

If the permeability of the surrounding strata and storage is low, dewatering by pumping may dry up the hole, in which case the on-site Land Contamination Specialist will decide whether the requirement to pump out three times the liquid volume is to be waived.

After the dewatering process (and allowing groundwater to percolate back into the hole if it has been pumped dry), enough quantity of groundwater sample shall be collected from each drillhole, and then stored in different sample containers for analysis. Immediately after collection, samples shall be transferred to labelled sample containers containing the necessary preservatives (supplied by the laboratory). Samples shall be stored between 2 – 4°C, and delivered to the laboratory within 24 hours. All samples shall be collected under chain-of-custody protocols.

6.2.5 Sample Size and Handling Criteria

Recommended sample size, sample containers and preservative procedures for each chemical analysis of the soil and groundwater have been summarized in **Table 6.2**. The containers shall be marked with sampling point codes and the depths at which the samples were taken. Samples shall be stored between 2°C – 4°C, and delivered to the laboratory within 24 hours.

Table 6.2: Summary of sample handling criteria

Analytical Parameters	Sample Size	Sample Container	Preservation	Notes
Soil Sample				
All major analyses in soil sample	2 X 500g	Glass Jar with Teflon Lined Lid	Refrigeration at 2°C – 4°C	The soil jar must be filled to minimise headspace when volatiles are to be determined.
Groundwater Sample				
Metals	250ml	Clear Plastic Bottle	Nitric Acid (HNO ₃) Refrigeration at 2°C – 4°C	For Dissolved Metals the sample must be filtered prior to acidification.
TPH (C ₆ – C ₈)	2 X 40ml	Glass Vial with Teflon Lined Lid	Hydrochloric Acid (HCl) Refrigeration at 2°C – 4°C	The vials must be filled for zero headspace.
VOCs				
TPH (C ₉ – C ₁₆)	1L	Amber Glass Bottle with Teflon Lined Cap	Refrigeration at 2°C – 4°C	-
TPH (C ₁₇ – C ₃₅)				
SVOCs				
PCBs				
Cyanide, free	250ml	White Plastic Bottle	Sodium Hydroxide (NaOH) & Cadmium Nitrate (Cd(NO ₃) ₂) Refrigeration at 2°C – 4°C	-
Dioxins	2 x 1L	Amber Glass Bottle with Teflon Lined Cap	Refrigeration at 2°C – 4°C	-

6.2.6 Analytical Programme

6.2.6.1 Analytical Parameters

Soil and groundwater samples collected at each sampling point should be analyzed for parameters in accordance with the sampling and testing schedule shown in **Table 6.3** and analysed by a HOKLAS accredited laboratory in accordance with the analytical methods given in **Table 6.4**.

- **Volatile Organic Compounds (VOCs):** acetone, benzene, bromodichloromethane, 2-butane, chloroform, ethylbenzene, methyl tert-butyl ether, methylene chloride, styrene, tetrachloroethene, toluene, trichloroethene, xylenes (total)
- **Semi Volatile Organic Compounds (SVOCs):** acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis-(2-ethylhexyl)phthalate, chrysene,

dibenzo(a,h)anthracene, fluoranthene, fluorene, hexachlorobenzene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, phenol, pyrene

- **Metals:** antimony, arsenic, barium, cadmium, chromium III, chromium VI, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, tin, zinc
- **Dioxins / PCBs:** Dioxins (I-TEQ), PCBs
- **Total Petroleum Hydrocarbon (TPH):** Carbon Ranges C6-C8, C9-C16 and C17-C35
- **Cyanide:** Cyanide, free

If the subject site area is assessed as contaminated, and excavation and disposal is envisaged as the only suitable cleanup method, then the soil samples from the most contaminated area shall be treated by Toxicity Characteristic Leaching Procedure (TCLP) subject to the direction of the Land Contamination Specialist. Landfill disposal criteria for contaminated soil are shown in **Table 6.5**.

A HOKLAS accredited testing laboratory shall be appointed to conduct chemical analysis for the soil and groundwater samples. All laboratory test methods shall be accredited by the HOKLAS or one of its Mutual Recognition Arrangement Partners. The RBRGs for soil and soil saturation limits and RBRGs for groundwater and groundwater solubility limits are given in **Appendix H**.

The Project involves construction of a new railway. The sampling locations along SCL are considered to be occupied as "Industrial" purpose for future landuse, under RBRG's landuse category. Relevant soil and groundwater RBRGs levels for industrial landuse are shown in **Appendix H**.

Table 6.3 Sampling and testing schedule

Site ID	Sampling ID	Location	Current and Historical Landuse	Testing Parameter					
				VOCs	SVOCs	Metals	TPH	Dioxins / PCBs	Cyanide, free
L1	2209/SCL/EDH001(P)	NT South Animal Centre	Store room for chemical	✓	✓	✓	✓		✓
L3	2209/SCL/ETT166 2209/SCL/ETT167	Towngas Offtake Station	Towngas pipeline and offtake station	✓	✓	✓	✓		
L4	2209/SCL/DH037(P) 2209/SCL/EDH045 2209/SCL/EDH043 2209/SCL/EDH127 2209/SCL/EDH039 2209/SCL/DH046(P) 2209/SCL/EDH128 2209/SCL/EDH125 2209/SCL/EDH126 2209/SCL/EDH038 2209/SCL/EDH036 2209/SCL/EDH033 2209/SCL/EDH028 2209/SCL/EDH042 2209/SCL/EDH031	Former Tai Hom Village	Historical squatter area	✓	✓	Lead, Chromium, Zinc, Copper	✓		
			Historical metal workshops	✓	✓	✓	✓	✓	✓
			Historical car repair workshop	✓	✓	✓	✓	✓	✓
			Historical plastics factory	✓	✓	✓	✓	✓	✓
			Historical dye factory	✓	✓	✓	✓	✓	✓
			Historical storage area	✓	✓	Lead, Chromium, Zinc, Copper	✓		
			Toilet Facilities and Refuse Collections Points	✓	✓	✓	✓		
L13	2209/SCL/EDH119	Former petrol station adjacent to Chatham Road North	Historical land use: fuel storage of diesel and gasoline	✓	✓	Lead	✓		
L14	2209/SCL/ETT105 2209/SCL/EDH118	Kerosene store along Chung Hau Street	Fuel storage	✓	✓	✓	✓		
L15	2209/SCL/EDH252	Shell Petrol Station along Ma Tau Wai Road	Storage tanks of diesel and gasoline	✓	✓	Lead	✓		

Site ID	Sampling ID	Location	Current and Historical Landuse	Testing Parameter					
				VOCs	SVOCs	Metals	TPH	Dioxins / PCBs	Cyanide, free
L16	2209/SCL/EDH253(P)	Caltex Petrol Station along Ma Tau Wai Road	Storage tanks of diesel and gasoline	✓	✓	Lead	✓		
L17	2209/SCL/ETT068	International Mail Centre	DG store: storage of kerosene, thinner and paint Store room: storage of both lubricating and waste oil	✓	✓	✓	✓		✓
	2209/SCL/ETT106		Fuel tank room: diesel; operation Emergency generator room	✓	✓	✓	✓		
	2209/SCL/EDH256 2209/SCL/EDH257		Historical unknown open storage	✓	✓	✓	✓		
SM-1	EDHSM-1	Fuel/Oil Filling Station inside Shek Mun WSD's works area	Fuel filling and storage area	✓	✓	Lead	✓		

Table 6.4 Method of analysis for soil and groundwater samples

Parameter	Referenced Analytical Method	Reporting Limit for Soil (mg/kg)	Reporting Limit for Groundwater (mg/L)
VOCs			
Acetone	USEPA Method 8260	5	0.05
Benzene		0.5	0.005
Bromodichloromethane		0.5	0.005
2-Butanone		5	0.05
Chloroform		0.5	0.005
Ethylbenzene		0.5	0.005
Methyl tert-Butyl Ether		0.5	0.005
Methylene Chloride		5	0.05
Styrene		0.5	0.005
Tetrachloroethene		0.5	0.005
Toluene		0.5	0.005
Trichloroethene		0.5	0.005
Xylenes (Total)		1.5	0.015
SVOCs			
Acenaphthlene	USEPA Method 8270	0.5	0.002
Acenaphthene		0.5	0.002
Anthracene		0.5	0.002
Benzo(a)anthracene		0.5	-
Benzo(a)pyrene		0.5	-
Benze(b)floranthene		1.0	0.004
Benzo(g,h,i)perylene		0.5	-
Benzo(k)fluoranthene		1.0	0.004
Bis-(2-Ethylhexyl)phthalate		5.0	-
Chrysene		0.5	0.002
Dibenzo(a,h)anthracene		0.5	-
Fluoranthene		0.5	0.002
Fluorene		0.5	0.002
Hexachlorobenzene		0.2	0.004
Indeno(1,2,3-cd)pyrene		0.5	-
Naphthalene		0.5	0.002
Phenanthrene		0.5	0.002
Phenol		0.5	-
Pyrene		0.5	0.002
Metals			
Antimony	USEPA Method 6020A	1	-
Arsenic		1	-
Barium		0.5	-
Cadmium		0.2	-
Chromium III		0.5	-
Chromium VI		0.5	-
Cobalt		0.5	-
Copper		1	-
Lead		1	-
Manganese		0.5	-
Mercury		0.05	< 0.0001
Molybdenum		1	-
Nickel		1	-
Tin		0.5	-
Zinc		1	-
TPH			
C6-C8	USEPA Method 8015	5	0.02
C9-C16		200	0.5
C17-C35		500	0.5
PCBs	USEPA Method 8080	0.1	0.0001
Dioxins	USEPA Method 1613B and 8290	5.01 pg/g	50.1 pg/L
Cyanide, free	USEPA Method 9010A	1	0.01

6.2.7 Storage of Surplus Soil Samples

It is envisaged that the likely scale of contamination should be very much localized, if found. The volume of soil expected to require cleanup should be of small quantities. Landfill disposal may be a practical option and should be considered as the last resort. Additional tests in terms of Toxicity Characteristic Leaching Procedure (TCLP) would be required to meet the criteria for disposal to landfills. Hence, surplus soil samples obtained during the site investigation would be stored for subsequent TCLP tests if identified necessary.

Landfill disposal criteria for contaminated soil is shown in **Table 6.5**.

Table 6.5 Landfill disposal criteria for contaminated soil

Parameter	TCLP Limit (ppm)	Referenced Analytical Method	Detection Limit (mg/L)
Cadmium	10	USEPA Method 1311 and 6020A	0.2
Chromium	50		1
Copper	250		1
Nickel	250		1
Lead	50		1
Zinc	250		1
Mercury	1		0.2
Tin	250		1
Silver	50		1
Antimony	150		1
Arsenic	50		1
Beryllium	10		1
Thallium	50		1
Vanadium	250		1
Selenium	1		0.2
Barium	1000		1

Ref: EPD's Guidance Notes for Investigation and Remediation of Contaminated Sites of: Petrol Filling Stations, Boatyards, Car Repair/ Dismantling Workshops

6.2.8 Quality Control and Quality Assurance (QA/QC)

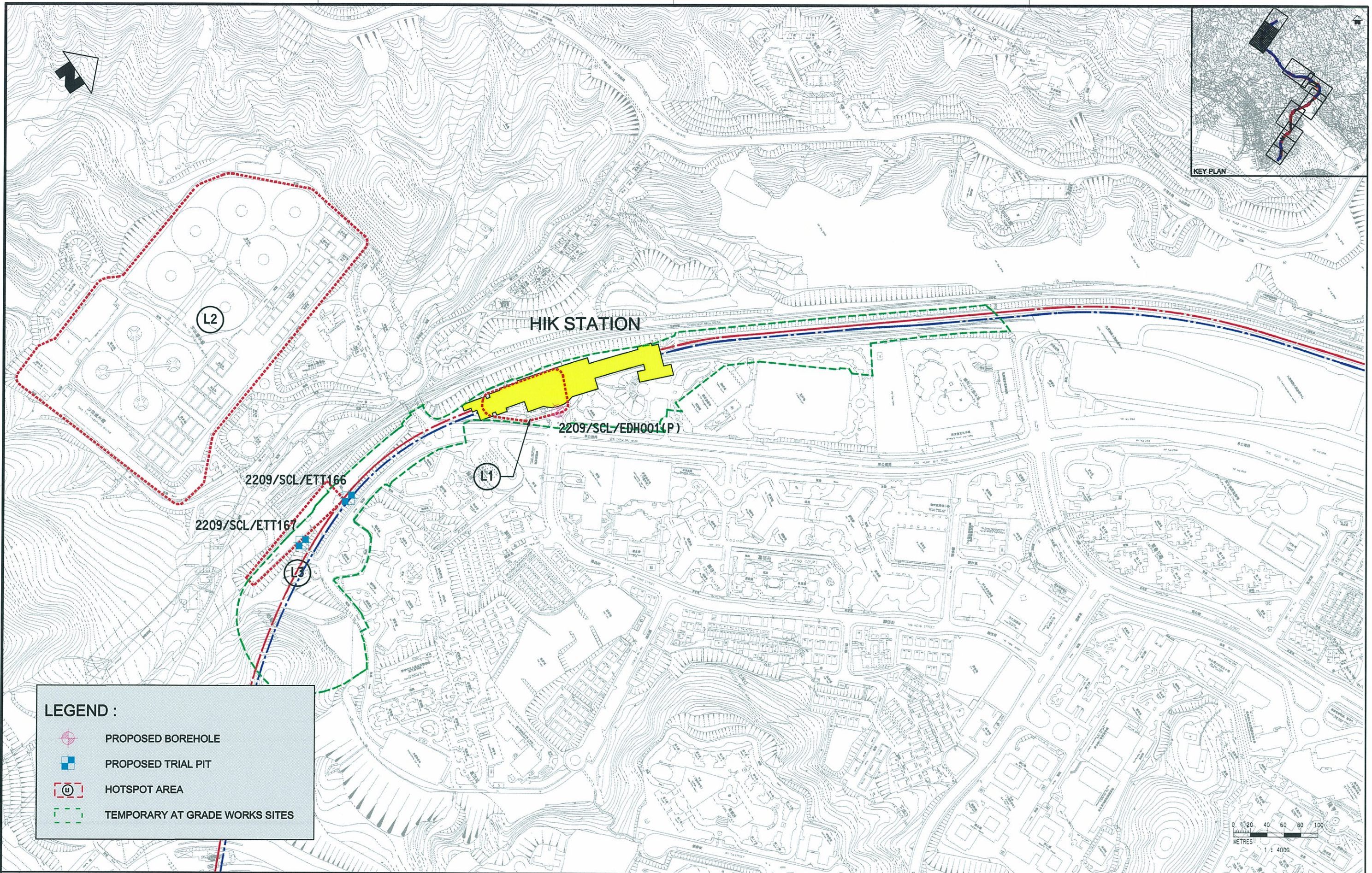
A proper QA/QC program shall be established to ensure that the data collected are accurate and representative of actual soil and groundwater conditions. The QA/QC programme shall include the following:

- 1 duplicate per 20 samples;
- 1 equipment blank per 20 samples;
- 1 field blank per 20 samples; and
- 1 trip blank per trip for the analysis of volatile parameters.





6.2.9 Sample Handling, Packaging and Transport

The soil and groundwater sampling shall be conducted by an experienced sampling technician (provided by the G.I. Contractor), and appropriate procedures shall be adhered to. Sampling methodologies are based on the techniques developed by the USEPA. Sampling tools shall be cleaned thoroughly before, in-between and after each sampling. Special care shall be taken to prevent any cross contamination of the samples during collection, handling, and storage.

Sample containers shall be laboratory cleansed, airtight, and made of glass or other suitable materials with Teflon-lined lids to ensure that the container does not react with the sample or absorb contaminants. Care shall be taken when recording and labelling the sample information on the containers. Information such as the date/time, sample point codes, depths, and any other relevant data shall be included. Samples shall be stored in an icebox (at about 2°C – 4°C) immediately after collection and labelled, until they can be transported to the laboratory for analysis.





LEGEND :

-  PROPOSED BOREHOLE
-  PROPOSED TRIAL PIT
-  HOTSPOT AREA
-  TEMPORARY AT GRADE WORKS SITES

PRINTED BY: \$USER\$ \$DATE\$ \$TIME\$
 PLOT DRW: \$PLTDRW\$ \$MODEL\$ \$FILES\$
 MODELNAME: \$MODEL\$ \$FILES\$
 FILENAME: \$FILE\$

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
D	FOURTH ISSUE	LK	10/09	FC					
C	THIRD ISSUE	LK	06/09	FC					
B	SECOND ISSUE	LK	04/09	FC					
A	FIRST ISSUE	LK	12/08	FC					

DRAWN	LK
DESIGNED	LK
CHECKED	SC
APPROVED	FC
DATE	OCT/2009

 **MTR**
 SHATIN TO CENTRAL LINK
 ORIGINATOR
 **ARUP** Ove Arup & Partners
 Hong Kong Limited
 CADD REF. NEX2206_C_SCL_OAP_ENV_003D

TITLE
NEX 2206 – TAW TO HUH SECTION
 Locations of Potentially Contaminated
 Sites and Sampling Locations
 (Sheet 2 of 9)

SCALE 1 : 4000 (A3) DRAWING NO. Figure 4.1.2 REV. D

DO NOT SCALE DRAWINGS. ALL DIMENSIONS SHALL BE VERIFIED ON SITE.
 © MTR CORPORATION LIMITED 2008. COPYRIGHT IN RESPECT OF THIS DRAWING DOCUMENT IS OWNED BY THE MTR CORPORATION LIMITED OF HONG KONG. NO REPRODUCTION OF THE DRAWING DOCUMENT OR ANY PART BY WHATEVER MEANS IS PERMITTED WITHOUT THE PRIOR WRITTEN CONSENT OF THE MTR CORPORATION LIMITED.

APPENDIX B

SITE BORING LOG



DRILLHOLE RECORD

CONTRACT NO. 11203

HOLE NO. **11203/SCL/EB179**

SHEET **1** of **3**

PROJECT **Stage II Further Ground Investigation for Shatin to Central Link**

METHOD **ROTARY**

CO-ORDINATES

WORKS ORDER NO. **D-463**

MACHINE **SD5**

E 835664.85
N 824948.42

DATE **23.05.2011** to **26.05.2011**

FLUSHING MEDIUM **NONE**

ORIENTATION **VERTICAL**

GROUND LEVEL **+12.12 mPD**

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
23.05.2011	PW								+12.12	0.00			Firm to stiff, light greenish grey, sandy CLAY/ SILT with occasional subangular fine gravel. (FILL)
1								1 H 0.45	+11.62	0.50			Soft to firm, light yellowish brown, slightly sandy clayey SILT. (FILL)
2								2 H 0.95					
3								3 H 1.45	+10.62	1.50			Soft, light bluish grey mottled yellowish brown, silty sandy CLAY. (ALLUVIUM)
4								4 H 1.95	+10.12	2.00			Soft, light yellowish brown mottled brown, silty sandy CLAY with some subangular fine to medium gravel. (ALLUVIUM)
5								5 H 2.45	+9.62	2.50			Reddish brown and brownish yellow, clayey silty fine to coarse SAND with some subangular to subrounded fine to coarse gravel of rock fragments. (ALLUVIUM)
6			100				B=104	6 H 2.95	+9.12	3.00			Brownish yellow and light greenish grey, slightly clayey silty sandy subangular fine to coarse GRAVEL sized quartz and rock fragments. (ALLUVIUM)
7								7 H 3.00					
8								8 H 3.45					
9									+7.62	4.50			Pink to yellowish brown, subangular coarse GRAVEL and occasional cobble sized rock fragments. (ALLUVIUM)
10			31					T2-101	+6.97	5.15			Dry drilling.
11													
12									+6.12	6.00			Extremely weak, pink to light brown spotted white, completely decomposed medium grained GRANITE. (Clayey silty fine to coarse SAND with some angular fine gravel)
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													
61													
62													
63													
64													
65													
66													
67													
68													
69													
70													
71													
72													
73													
74													
75													
76													
77													
78													
79													
80													
81													
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
96													
97													
98													
99													
100													

- ↓ SMALL DISTURBED SAMPLE
- ↑ LARGE DISTURBED SAMPLE
- ▨ U76 SAMPLE
- ▨ PISTON SAMPLE (76mm)
- ▨ MAZIER SAMPLE
- ▨ SPT LINER SAMPLE
- ▨ WATER SAMPLE
- ▨ U100 SAMPLE
- ↓ STANDARD PENETRATION TEST
- ∨ IN-SITU VANE SHEAR TEST
- ⊥ PACKER TEST
- ⊥ PERMEABILITY TEST
- ⊥ PRESSUREMETER TEST
- ⊥ BOREHOLE TELEVIEWER
- ▨ PIEZOMETER TIP
- STANDPIPE TIP

LOGGED L. Zhang

DATE 27.05.2011

CHECKED C. Lun

DATE 28.05.2011

REMARKS

- An inspection pit was excavated to 3.00m deep by hand tools.
- Water sample was taken at 6.50m.
- Soil samples taken by U76 sampler were removed from the sampler tubes for environmental testing.



DRILLHOLE RECORD

CONTRACT NO. 11203

HOLE NO. **11203/SCL/EB179**

SHEET **2** of **3**

PROJECT Stage II Further Ground Investigation for Shatin to Central Link

METHOD **ROTARY**

CO-ORDINATES

WORKS ORDER NO. **D-463**

E 835664.85

DATE **23.05.2011** to **26.05.2011**

N 824948.42

MACHINE **SD5**

FLUSHING MEDIUM **NONE**

ORIENTATION **VERTICAL**

GROUND LEVEL **+12.12 mPD**

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
24.05.2011 25.05.2011		0.85 at 1800										V	As sheet 1 of 3.
		1.62 at 0800											
12			100				B=244	13 12.00 14 12.45					
13													
14													
15			100				B=260	15 15.00 16 15.15	-2.88	15.00		V/IV	Very weak to weak, pink, locally light yellow spotted white, completely to highly decomposed medium grained GRANITE. (Angular, slightly sandy fine to coarse GRAVEL sized quartz and granite fragments)
16													
17													
18	HW 18.10m	0.50 at 1800	61	0	0	NI	B=200	17 18.00 18 18.06	-5.98	18.10		IV	Weak, yellowish brown, spotted white and black, highly decomposed medium grained GRANITE. (Angular, medium to coarse GRAVEL sized granite fragments)
25.05.2011 26.05.2011		1.70 at 0800				>20		T2-101 18.48	-6.24	18.36		III	Moderately strong, brownish pink spotted white, moderately decomposed medium grained GRANITE.
19			99	77	55	>20		T2-101 18.82		18.93			Jointed, moderately strong, brownish pink spotted white, moderately decomposed medium grained GRANITE.
26.05.2011						3.2		19.24		19.49			Joints are closely to medium, locally very closely spaced, rough planar and stepped, iron and manganese oxide stained, chlorite coated (<1mm),
20						12.0			-7.37	19.49			
<p> ↑ SMALL DISTURBED SAMPLE ↓ LARGE DISTURBED SAMPLE U76 SAMPLE PISTON SAMPLE (76mm) MAZIER SAMPLE SPT LINER SAMPLE WATER SAMPLE U100 SAMPLE STANDARD PENETRATION TEST IN-SITU VANE SHEAR TEST PACKER TEST PERMEABILITY TEST PRESSUREMETER TEST BOREHOLE TELEVIEWER PIEZOMETER TIP STANDPIPE TIP </p>												<p>LOGGED L. Zhang</p> <p>DATE 27.05.2011</p> <p>CHECKED C. Lun</p> <p>DATE 28.05.2011</p>	REMARKS



DRILLHOLE RECORD

CONTRACT NO. 11203

HOLE NO. **11203/SCL/EB179**

SHEET **3** of **3**

PROJECT Stage II Further Ground Investigation for Shatin to Central Link

METHOD **ROTARY**

CO-ORDINATES

WORKS ORDER NO. **D-463**

E **835664.85**

DATE **23.05.2011** to **26.05.2011**

N **824948.42**

MACHINE **SD5**

FLUSHING MEDIUM **NONE**

ORIENTATION **VERTICAL**

GROUND LEVEL **+12.12 mPD**

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21													dipping at 15° to 25° and 65° to 75°. End of hole at 19.49 m.
22													
23													
24													
25													
26													
27													
28													
29													
30													

- ⬇ SMALL DISTURBED SAMPLE
- ⬆ LARGE DISTURBED SAMPLE
- ▨ U76 SAMPLE
- ▨ PISTON SAMPLE (76mm)
- ▨ MAZIER SAMPLE
- ▨ SPT LINER SAMPLE
- ▲ WATER SAMPLE
- U100 SAMPLE
- ⬇ STANDARD PENETRATION TEST
- ▼ IN-SITU VANE SHEAR TEST
- ⬇ PACKER TEST
- ⬇ PERMEABILITY TEST
- ⬇ PRESSUREMETER TEST
- ⬇ BOREHOLE TELEVIEWER
- PIEZOMETER TIP
- STANDPIPE TIP

LOGGED L. Zhang
 DATE 27.05.2011
 CHECKED C. Lun
 DATE 28.05.2011

REMARKS

APPENDIX C

CHAIN OF CUSTODY (COC) DOCUMENTS

CHAIN OF CUSTODY DOCUMENTATION

H 020382



ALS Laboratory Group

CLIENT: *Drilltech Ground Engineering Ltd*

SAMPLER:

ADDRESS / OFFICE:

MOBILE: *9289445 / 60991374*

PROJECT MANAGER (PM): *Mr. Ken Li / Ho Kwok Hing*

PHONE:

PROJECT ID: *D463*

EMAIL REPORT TO: *kenli@drilltech.com.hk*

SITE: *Hin Keng Street*

EMAIL INVOICE TO: (if different to report)

RESULTS REQUIRED (Date):

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
 COOLER SEAL (circle appropriate)
 Intact: Yes No N/A
 SAMPLE TEMPERATURE
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

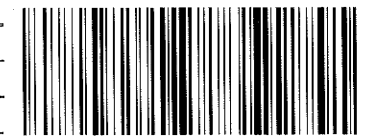
Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water) CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
1	<i>11203/SCL/EB17P</i>	<i>W</i>	<i>24/5/2011</i>	<i>14:30</i>		<i>1</i>
	<i>(Ground Water Sample at depth 5.50m)</i>					
2	<i>11203/SCL/EB17P(C.P.O.M)</i>	<i>S</i>	<i>24/5/2011</i>	<i>16:05</i>		<i>2</i>
3	<i>Trip Blank</i>					<i>2</i>

Cyanide

ALS Technichem HK Pty Ltd
 Work Order
HK1111670



Telephone : +852 2610 1044

RELINQUISHED BY:
 Name: *Ken Li / Ho Kwok HING* Date: *24-5-2011*
 Of: *Drilltech* Time: *16:20*

RECEIVED BY:
 Name: *[Signature]* Date: *24/5/11*
 Of: *[Signature]* Time: *1630*

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

CHAIN OF CUSTODY DOCUMENTATION

H 020119



ALS Laboratory Group

CLIENT: *Driltech Ground Engineering LTD*

SAMPLER:

ADDRESS / OFFICE:

MOBILE: *9289-9495 / 94438960*

PROJECT MANAGER (PM): *Mr Ken Li / Jack Leung*

PHONE:

PROJECT ID: *2463*

EMAIL REPORT TO: *kenli@driltech.com-hk / kahojack2005@yahoo.com-hk*

SITE: *Hin Keung street*

P.O. NO.:

EMAIL INVOICE TO: (if different to report)

RESULTS REQUIRED (Date):

QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

COOLER SEAL (circle appropriate)

Intact: Yes No *(N/A)*

SAMPLE TEMPERATURE

CHILLED: Yes No

Cyanide

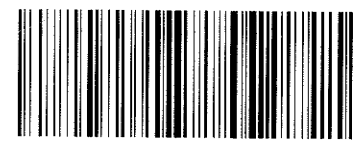
Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)

CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles																			
<i>1</i>	<i>Equipment Blank</i>	<i>W</i>	<i>26/5/11</i>	<i>11500</i>		<i>4</i>	<input checked="" type="checkbox"/>																		
<i>2</i>	<i>Field Blank</i>	<i>W</i>	<i>26/5/11</i>	<i>11500</i>		<i>4</i>	<input checked="" type="checkbox"/>																		

ALS Technichem HK Pty Ltd
Work Order
HK1111855



Telephone : + 852 2610 1044

RELINQUISHED BY:		RECEIVED BY:	
Name: <i>Ken Li / Leung Jack</i>	Date: <i>26/5/2011</i>	Name: <i>[Signature]</i>	Date: <i>26/5/11</i>
Of: <i>Driltech</i>	Time:	Of: <i>[Signature]</i>	Time: <i>1415</i>
Name:	Date:	Name:	Date:
Of:	Time:	Of:	Time:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;
V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

CHAIN OF CUSTODY DOCUMENTATION

H 020118



ALS Laboratory Group

CLIENT: Driftech Ground Engineering LTD
 ADDRESS / OFFICE:
 PROJECT MANAGER (PM): Mr Ken Li / Jack Leung
 PROJECT ID: 1463
 SITE: Hin Keng street P.O. NO.:
 RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
 MOBILE: 9289-9498 / 9443-8960
 PHONE:
 EMAIL REPORT TO: kalin@driftech.com.hk / kalinjack2005@yahoo.com.hk
 EMAIL INVOICE TO: (if different to report)
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
 COOLER SEAL (circle appropriate)
 Intact: Yes No N/A
 SAMPLE TEMPERATURE
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

CYANIDE

Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION		
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
1	11201/SCC/EMT9 (12.0M)	S	25/5/11	09:30		2
2	Top Blank					2
3	11202/SCC/EMT9 (15.0M)	S	25/5/11	13:40		2
① 4	11203/SCC/EMT9 (15.0M) <u>Duplicate</u> <u>Duplicate</u>	S	25/5/11	13:40		

RELINQUISHED BY:
 Name: Ken Li / Jack Leung Date: 25/5/2011
 Of: Driftech Time: 16:20
 Name: Date:
 Of: Time:

RECEIVED BY:
 Name: [Signature] Date: 25/5/11
 Of: [Signature] Time: 17:30
 Name: Date:
 Of: Time:

ALS Technichem HK Pty Ltd
 Work Order
HK1114018

 Telephone : +852 2610 1044

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

APPENDIX D

**LABORATORY RESULT SUMMARY AND CERTIFICATES OF
ANALYSIS**

Soil Analytical Result Summary

Parameters			Cyanide, Free	
			Unit	mg/kg
			LOR	1
			RBRGs of Industrial	10000*
			Saturation Limit	-
Sample Location	Sampling Depth (m bgs)	Date of Sampling		
11203/SCL/EB179	0.5	23-May-11	<1	
11203/SCL/EB179	1.5	23-May-11	<1	
11203/SCL/EB179	3.0	23-May-11	<1	
11203/SCL/EB179	6.0	23-May-11	<1	
11203/SCL/EB179	9.0	24-May-11	<1	
11203/SCL/EB179	12.0	25-May-11	<1	
11203/SCL/EB179	15.0	25-May-11	<1	
11203/SCL/EB179 (Duplicate)	15.0	25-May-11	<1	

Note:

LOR= Level of Reporting

*: "ceiling limit" concentration

Full analytical results should be referred to laboratory report

Groundwater Analytical Result Summary

Parameters		Cyanide, Free	
		Unit	mg/L
		LOR	0.01
		RBRGs of Industrial	--
		Saturation Limit	--
Sample Location	Date of Sampling		
11203/SCL/EB179	24-May-11	<0.01	

Note:

LOR= Level of Reporting

Relative Percentage Difference

Parameters			Cyanide, free	
			Unit	mg/kg
			LOR	1
			Sample Location	Sampling Depth (m BBC)
11203/SCL/EB179	15.0	25-May-11	<1	
11203/SCL/EB179 (Duplicate)	15.0	25-May-11	<1	
$RPD = \frac{ (Primary-Duplicate) }{\text{Mean of Results}} * 100\%$			NC	

Note:

NC= Not calculated, at least one result was ND

LOR= Level of Reporting

QA/QC result

Parameters		Cyanide, Free
Unit		mg/L
LOR		0.01
Sample ID	Date of Sampling	
Trip Blank1	23-May-12	<0.01
Trip Blank2	23-May-12	<0.01
Trip Blank3	23-May-12	<0.01
Trip Blank4	23-May-12	<0.01
Trip Blank	24-May-12	<0.01
Trip Blank	25-May-12	<0.01
Equipment Blank	26-May-12	<0.01
Field Blank	26-May-12	<0.01

Note:

LOR= Level of Reporting

Full analytical results should be referred to laboratory report



CERTIFICATE OF ANALYSIS

Client	: DRILTECH GROUND ENGINEERING LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR KEN LI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1111613
Address	: BLOCK A & B, 9/F, PHASE VI, HONG KONG SPINNERS IND BLDG, NO 481-483 CASTLE PEAK ROAD, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kenli@driltech.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2371 0008	Telephone	: +852 2610 1044		
Facsimile	: +852 2744 1037	Facsimile	: +852 2610 2021		
Project	: D463	Quote number	: ----	Date Samples Received	: 23-MAY-2011
Order number	: ----			Issue Date	: 02-JUN-2011
C-O-C number	: H020117			No. of samples received	: 8
Site	: HIN KENG STREET			No. of samples analysed	: 8

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 26-MAY-2011

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: **HK1111613**

Sample(s) were received 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.

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

Fung Lim Chee, Richard

Position

General Manager

Authorised results for

Inorganics

ALS Laboratory Group

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong

Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company



Analytical Results

Sub-Matrix: SOIL

				Client sample ID	11203/SCL/EB179 (0.5M)	11203/SCL/EB179 (1.5M)	11203/SCL/EB179 (3.0M)	11203/SCL/EB179 (6.0M)	
				Client sampling date / time	23-MAY-2011 10:00	23-MAY-2011 10:30	23-MAY-2011 11:00	23-MAY-2011 14:30	
Compound	CAS Number	LOR	Unit		HK1111613-001	HK1111613-002	HK1111613-003	HK1111613-004	
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		14.2	19.8	15.8	13.1	
ED/EK: Inorganic Nonmetallic Parameters									
EK026MD: Total Cyanide	57-12-5	1	mg/kg		<1	<1	<1	<1	



Sub-Matrix: WATER				Client sample ID	TRIP BLANK 1	TRIP BLANK 2	TRIP BLANK 3	TRIP BLANK 4	
				Client sampling date / time	[23-MAY-2011]	[23-MAY-2011]	[23-MAY-2011]	[23-MAY-2011]	
Compound	CAS Number	LOR	Unit	HK1111613-005	HK1111613-006	HK1111613-007	HK1111613-008		
ED/EK: Inorganic Nonmetallic Parameters									
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01		



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1805326)								
HK1111613-001	11203/SCL/EB179 (0.5M)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.2	13.9	1.6
HK1111670-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.7	13.3	9.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)								
HK1111613-002	11203/SCL/EB179 (1.5M)	EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0
Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)								
HK1111613-006	TRIP BLANK 2	EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01	0.0

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

Matrix: SOIL				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
Method: Compound	CAS Number	LOR	Unit		Result	LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)											
EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	2 mg/kg	102	----	75	125	----	----
Matrix: WATER				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
Method: Compound	CAS Number	LOR	Unit		Result	LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)											
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	0.2 mg/L	102	----	85	115	----	----

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

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)										
HK1111613-001	11203/SCL/EB179 (0.5M)	EK026MD: Total Cyanide	57-12-5	20 mg/kg	81.6	----	75	125	----	----
Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)										
HK1111613-005	TRIP BLANK 1	EK026MD: Total Cyanide	57-12-5	0.2 mg/L	93.4	----	75	125	----	----



CERTIFICATE OF ANALYSIS

Client	: DRILTECH GROUND ENGINEERING LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR KEN LI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1111670
Address	: BLOCK A & B, 9/F, PHASE VI, HONG KONG SPINNERS IND BLDG, NO 481-483 CASTLE PEAK ROAD, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kenli@driltech.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2371 0008	Telephone	: +852 2610 1044		
Facsimile	: +852 2744 1037	Facsimile	: +852 2610 2021		
Project	: D463	Quote number	: ----	Date Samples Received	: 24-MAY-2011
Order number	: ----			Issue Date	: 02-JUN-2011
C-O-C number	: H020382			No. of samples received	: 3
Site	: HIN KENG STREET			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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 26-MAY-2011

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: **HK1111670**

Sample(s) were received 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.

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

Fung Lim Chee, Richard

Position

General Manager

Authorised results for

Inorganics

ALS Laboratory Group

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong

Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company



Analytical Results

Sub-Matrix: SOIL

Client sample ID

11203/SCL/EB179
(9.0M)

Client sampling date / time

24-MAY-2011 16:05

Compound	CAS Number	LOR	Unit	HK1111670-002				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.7				
ED/EK: Inorganic Nonmetallic Parameters								
EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1				



Sub-Matrix: WATER			Client sample ID	11203/SCL/EB179 (GROUND WATER SAMPLE AT DEPTH 5.50M)	TRIP BLANK			
			Client sampling date / time	24-MAY-2011 14:30	[24-MAY-2011]			
Compound	CAS Number	LOR	Unit	HK1111670-001	HK1111670-003			
ED/EK: Inorganic Nonmetallic Parameters								
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01			



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1805326)								
HK1111613-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.2	13.9	1.6
HK1111670-002	11203/SCL/EB179 (9.0M)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.7	13.3	9.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)								
HK1111613-002	Anonymous	EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0
Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)								
HK1111613-006	Anonymous	EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01	0.0

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

Matrix: SOIL				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
Method: Compound	CAS Number	LOR	Unit		Result	LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)											
EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	2 mg/kg	102	----	75	125	----	----
Matrix: WATER				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
Method: Compound	CAS Number	LOR	Unit		Result	LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)											
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	0.2 mg/L	102	----	85	115	----	----

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

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)										
HK1111613-001	Anonymous	EK026MD: Total Cyanide	57-12-5	20 mg/kg	81.6	----	75	125	----	----
Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)										
HK1111613-005	Anonymous	EK026MD: Total Cyanide	57-12-5	0.2 mg/L	93.4	----	75	125	----	----



CERTIFICATE OF ANALYSIS

Client	: DRILTECH GROUND ENGINEERING LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR KEN LI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1111784
Address	: BLOCK A & B, 9/F, PHASE VI, HONG KONG SPINNERS IND BLDG, NO 481-483 CASTLE PEAK ROAD, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kenli@driltech.com.hk	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2371 0008	Telephone	: +852 2610 1044		
Facsimile	: +852 2744 1037	Facsimile	: +852 2610 2021		
Project	: D463	Quote number	: ----	Date Samples Received	: 25-MAY-2011
Order number	: ----			Issue Date	: 03-JUN-2011
C-O-C number	: H020118			No. of samples received	: 3
Site	: HIN KENG STREET			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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 27-MAY-2011

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: **HK1111784**

Sample(s) were received 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.

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

Fung Lim Chee, Richard

Position

General Manager

Authorised results for

Inorganics

ALS Laboratory Group

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong

Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company



Analytical Results

Sub-Matrix: SOIL

Client sample ID

11203/SCL/EB179
(12.0M)

11203/SCL/EB179
(15.0M)

Client sampling date / time

25-MAY-2011 09:30

25-MAY-2011 13:40

Compound	CAS Number	LOR	Unit	11203/SCL/EB179 (12.0M) 25-MAY-2011 09:30 HK1111784-001	11203/SCL/EB179 (15.0M) 25-MAY-2011 13:40 HK1111784-003			
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	11.2	7.7			
ED/EK: Inorganic Nonmetallic Parameters								
EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	<1			



Sub-Matrix: WATER				Client sample ID	TRIP BLANK				
				Client sampling date / time	[25-MAY-2011]				
Compound	CAS Number	LOR	Unit	HK1111784-002					
ED/EK: Inorganic Nonmetallic Parameters									
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01					



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1807264)								
HK1111778-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	52.7	50.5	4.4
HK1111834-007	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	7.6	7.8	3.2
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)								
HK1111613-002	Anonymous	EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0
Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)								
HK1111613-006	Anonymous	EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01	0.0

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

Matrix: SOIL				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration				Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	LCS	DCS	Low	High	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)											
EK026MD: Total Cyanide	57-12-5	1	mg/kg	<1	2 mg/kg	102	----	75	125	----	
Matrix: WATER				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method Blank (MB) Report				Spike Concentration				Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result	LCS	DCS	Low	High	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)											
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	0.2 mg/L	102	----	85	115	----	

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

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	MS	MSD	Low	High	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1809767)										
HK1111613-001	Anonymous	EK026MD: Total Cyanide	57-12-5	20 mg/kg	81.6	----	75	125	----	
Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	MS	MSD	Low	High	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)										
HK1111613-005	Anonymous	EK026MD: Total Cyanide	57-12-5	0.2 mg/L	93.4	----	75	125	----	



CERTIFICATE OF ANALYSIS

Client	: DRILTECH GROUND ENGINEERING LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR KEN LI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1111855
Address	: BLOCK A & B, 9/F, PHASE VI, HONG KONG SPINNERS IND BLDG, NO 481-483 CASTLE PEAK ROAD, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kenli@driltech.com.hk	E-mail	: Godfrey.Chan@alsenviro.com	Date Samples Received	: 26-MAY-2011
Telephone	: +852 2371 0008	Telephone	: +852 2610 1044	Issue Date	: 03-JUN-2011
Facsimile	: +852 2744 1037	Facsimile	: +852 2610 2021	No. of samples received	: 2
Project	: D463	Quote number	: ----	No. of samples analysed	: 2
Order number	: ----				
C-O-C number	: H020119				
Site	: HIN KENG STREET				

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 01-JUN-2011

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: **HK1111855**

Sample(s) were received in a chilled condition.

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

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

Fung Lim Chee, Richard

Position

General Manager

Authorised results for

Inorganics

ALS Laboratory Group

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong

Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company



Analytical Results

Sub-Matrix: WATER

				Client sample ID	EQUIPMENT BLANK	FIELD BLANK			
				Client sampling date / time	26-MAY-2011 11:00	26-MAY-2011 11:00			
Compound	CAS Number	LOR	Unit	HK1111855-001	HK1111855-002				
ED/EK: Inorganic Nonmetallic Parameters									
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01				



Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)								
HK1111613-006	Anonymous	EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	<0.01	0.0

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

Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)											
EK026MD: Total Cyanide	57-12-5	0.01	mg/L	<0.01	0.2 mg/L	102	----	85	115	----	----

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

Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1811091)										
HK1111613-005	Anonymous	EK026MD: Total Cyanide	57-12-5	0.2 mg/L	93.4	----	75	125	----	----



CERTIFICATE OF ANALYSIS

Client	: DRILTECH GROUND ENGINEERING LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR KEN LI	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1114018
Address	: BLOCK A & B, 9/F, PHASE VI, HONG KONG SPINNERS IND BLDG, NO 481-483 CASTLE PEAK ROAD, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kenli@driltech.com.hk	E-mail	: Godfrey.Chan@alsenviro.com	Date Samples Received	: 25-MAY-2011
Telephone	: +852 2371 0008	Telephone	: +852 2610 1044	Issue Date	: 29-JUN-2011
Facsimile	: +852 2744 1037	Facsimile	: +852 2610 2021	No. of samples received	: 1
Project	: D463	Quote number	: ----	No. of samples analysed	: 1
Order number	: ----				
C-O-C number	: H020118				
Site	: HIN KENG STREET				

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 22-JUN-2011

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: **HK1114018**

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.

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

Fung Lim Chee, Richard

Position

General Manager

Authorised results for

Inorganics

ALS Laboratory Group

Trading Name: **ALS Technichem (HK) Pty Ltd**

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong

Tel: +852 2610 1044 Fax: +852 2610 2021 www.alsenviro.com

A Campbell Brothers Limited Company



Analytical Results

Sub-Matrix: SOIL

Client sample ID

11203/SCL/EB179
 (15.0M)(DUPLICATE)

Client sampling date / time

25-MAY-2011 13:40

Compound	CAS Number	LOR	Unit	HK1114018-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	7.7				
ED/EK: Inorganic Nonmetallic Parameters								
EK025MD: Free Cyanide	----	1	mg/kg	<1				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1841423)								
HK1111613-002	Anonymous	EK025MD: Free Cyanide	----	1	mg/kg	<1	<1	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					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1841423)											
EK025MD: Free Cyanide	----	1	mg/kg	<1	2 mg/kg	102	----	85	115	----	----

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

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1841423)										
HK1111613-001	Anonymous	EK025MD: Free Cyanide	----	20 mg/kg	81.6	----	75	125	----	----

APPENDIX E

**STANDARD FORMS 3.2 and 3.4 – SOIL DATA SUMMARY AND
COMPARISON TO RBRGS AND C_{sat}**

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

Chemical	Frequency of detection (detected/total)	Range of Detected Concentration (mg/kg)	Range of Method Reporting Limit (mg/kg)	Analytical Method	Relevant Land Use Categories	Lowest RBRG(s) (mg/kg)	Csat (mg/kg)	Maximum Detected Concentration Exceeds (check if applicable)	
								RBRG	Csat
Cyanide, Free									
Cyanide, Free	0/8	ND	1	USEPA 9010A	Industrial	10000*	0	NIL	NIL

Note:

Csat = Saturation Limit

N/A = Not Applicable

ND = Not Detected

* indicates a "ceiling limit" concentration.

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
	Sample Number	Sample Depth (m, bgs)				
Cyanide, Free						
Cyanide, Free	NA	NA	ND	NIL	NIL	NA

Note:

ND= Not Detected

NA= Not Applicable

NIL= Concentration detected is below respective RBRG or solubility limit

* = Confirmatory tests would be carried out to further confirm size of affected area