Drainage Services Department

Contract No. SPW 09/2018
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Contamination Assessment Report
&
Remediation Action Plan

(Version 2.3)

June 2020

Checked By .....
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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8 June 2020

Drainage Services Department
Projects and Development Branch
Sewerage Projects Division
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Wan Chai
Hong Kong

By Post and E-mail

Attention: Messrs. Kenneth POON / KW CHAN

Dear Sirs,

Re: Contract No. SPW 09/2018
Environmental Team Baseline Surveys
for Sha Tin Cavern Sewage Treatment Works

Contamination Assessment Report and Remediation Action Plan (Condition 2.21 of EP-533/2017)

Reference is made to the captioned Contamination Assessment Report and Remediation Action Plan (Version 2.3) certified by the ET Leader and provided to us via e-mail on 1 June 2020.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with condition 1.9 of EP-533/2017.

Thank you very much for your attention and please do not hesitate to contact our Mr. Simon Cheung (Tel: 3465 2861) or the undersigned should you have any queries.

Yours sincerely,

YH Hui
Independent Environmental Checker

c.c.	AECOM	Attn: Kenneth Lee	by E-mail
	Cinotech	Attn: Mr. K S Lee / Ms. Karina Chan	by E-mail

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

Background

1.1 To support social and economic development in Hong Kong, there is a pressing need to optimize the supply of land for various uses by sustainable and innovative approaches. One possible approach is rock cavern development. The Policy Agenda of the 2016 Policy Address has stated that works for the relocation of the Sha Tin Sewage Treatment Works (STSTW) is to commence as soon as possible to release the existing site, of a size about 28 hectares, for development purpose.

1.2 The Relocation of STSTW to Caverns (the Project) is implemented so as to release the existing site, of a size about 28 hectares, for other uses.

1.3 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO). An Environmental Impact Assessment (EIA) Report for the Project was approved under EIAO in November 2016 (No.AEIAR-202/2016) in accordance with the EIA Study Brief (No.ESB-273/2014) and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). The corresponding Environmental Permit was issued (EP no.: EP-533/2017) by the Director of Environmental Protection (DEP) in March 2017.

1.4 According to Section 7 of the Contamination Assessment Plan (CAP) in the approved EIA Report and Section 5.1.1.1 in the EM&A Manual, further site walkover and/or detailed land contamination assessment will be required for sites that are inaccessible/ currently in operation/ yet to be constructed, which include the existing STSTW, Vehicle Detention Centre (VDC), David Camp and proposed Ah Kung Kok Shan Road surface magazine site (Magazine Site). As required in Condition 2.21 of the EP, detailed assessment of land contamination shall be carried out before the commencement of demolition/construction of the Project when access to the concerned site(s) identified in Appendix 6.01 of the approved EIA Report (Register No. AEIAR-202/2016) is available.

1.5 At the time of this study, the existing STSTW is still under operation while the VDC and David Camp have/will be handed over to the Lands Department (DLO). The Magazine Site is also accessible. The Technical Requirements Clause (D)(a)(ii) of the current study identified three assessment areas for further review as shown in **Figure 1** and tabulated in **Table 1-1**.

1.6 Cinotech Consultants Limited (Cinotech) was commissioned by the Drainage Services Department (DSD) to conduct Land Contamination Assessment focusing on the VDC, David Camp and Magazine Site for partial fulfilment of Condition 2.21 of the EP. The final version of the Supplementary Contamination Assessment Plan (CAP) (v3.1) has been submitted and approved by Environment Protection Department (EPD). This Contamination Assessment Report (CAR) and Remediation Assessment Plan (RAP), **Sections 5-8**, according to the EIA ref. no 6.7.1 of the implementation schedule (**Appendix G**) in the EM&A Manual, to detail the findings of the SI works and the

nature/extent of the contamination of the soil/groundwater contamination; and propose remediation for the identified contamination as appropriate.

Table 1-1 Land Contamination Assessment Locations

Location	Proposed Use	Justification for Assessment
Custom and Excise Department (C&ED) Vehicle Detention Centre (VDC)	Temporary works area for this project	To verify the potential contamination hotspots identified in the EIA Stage: • Temporary Storage Area of Spent Batteries (100m^2) • Storage area of seized goods (100 m^2)
Evangelical Lutheran Church of Hong Kong (David Camp)	Construction of Main Portal	Inaccessible in EIA Stage
Ah Kung Kok Shan Road Magazine Site ("Magazine Site")	Storage of explosives for construction works	To verify the finding in EIA Stage

Objective & Scope

1.7 This Contamination Assessment Report (CAR)/ Remediation Action Plan (RAP) is prepared to present the findings of the land contamination assessments with reference of the following legislation, guidelines and standards:

- Practice Guide for Investigation and Remediation of Contaminated Land (PG);
- Guidance Note for Contaminated Land Assessment and Remediation;
- Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management;
- Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C);
- Dangerous Goods Ordinance (Cap 295).

1.8 The CAR is included in **Sections 2 - 4** of this report to provide a summary of the Supplementary Contamination Assessment Plan (SCAP) as agreed in late 2018, describe the SI and sampling works conducted in this assessment and present the laboratory results and their interpretation of the collected samples.

1.9 As indication of soil/ groundwater contamination has been identified, based on laboratory testing results, a RAP is also proposed and presented in **Sections 5-7** of this report. The RAP / Supplementary RAP shall provide extent of the contamination based on the findings from the CAR / further laboratory testing results and recommend appropriate remediation methods for the identified soil contamination based on the exceeded

Chemicals of Concern (CoC). The supplementary RAP shall only be submitted if alternative remediation method would be proposed.

1.10 It should be stated that remediation should be carried out before any construction works could be conducted within the contamination extent. Meanwhile, no construction works should be carried out in all stockpiling areas, treatment areas and contamination areas prior to the agreement of RR and appropriate precautionary measures should be proposed to prevent any possible cross-contamination which is presented in **Section 7.22-7.24**.

2 REVIEW OF APPROVED SUPPLEMENTARY CONTAMINATION ASSESSMENT PLAN

2.1 The three assessment areas are located in Tai Shui Hang as illustrated in **Figures 1a – 1c** and described below:

- **The C&ED VDC** is located opposite to the existing STSTW separated by the Shing Mun River Channel. It is accessible via Hang Tai Road.
- **The David Camp** is located in A Kung Kok Street, about 170m to the northeast of Ah Kung Kok Fishermen Village.
- **The Magazine Site** is located at the upper end of A Kung Kok Shan Road next to the Neighbourhood Advice-Action Council Harmony Manor.

2.2 The SCAP identified the **VDC** site as the only potential land contamination area.

2.3 According to the EIA CAP, there were 6 proposed sampling locations within the previous VDC Site the Assessment Area (ENV-BH53 - ENV-BH58) for the Temporary Storage Area of Spent Batteries and Storage Area of Seized Goods. According to the approved CAP prepared by ERM in January 2018, two additional sampling locations (BH1 & BH2) were proposed for the Motor Spirit Transfer Area. Including the two proposed sampling locations at the locations of oil stains, there are 10 proposed sampling locations in total. The sampling locations and Chemicals of Concern (CoCs) proposed in CAPs agreed by the EPD are summarised in **Table 2-1** below.

Table 2-1 Summary of Proposed Sampling Points & CoCs for VDC

Potentially Contaminated Area	Sampling Location ID in this report	Sampling Location ID in EIA CAP	Sampling Depths (m bgl)		Proposed Testing Parameters
			Soil[f]	Groundwater	
Oil Stains	S1	N/A	Disturbed Sample 0.5m below ground Undisturbed Sample 1.5m, 3.0m, and 6.0m or at 2m below groundwater level, whichever is shallower.	Groundwater sample at static groundwater level	Metals[a], PCRs[b], VOCs[c], PAH[e]
	S2	N/A			
Motor Spirit Transfer Area	BH1	N/A	Disturbed Sample 0.5m below ground Undisturbed Sample 3.0m & 6.0m below ground	Groundwater sample at static groundwater level	Metals[a], PCRs[b], VOCs[c], SVOCs[d]
	BH2	N/A			
Storage Area of Seized Goods	BH3	ENV-BH56			Metals[a], PCRs[b], VOCs[c], SVOCs[d]
	BH4	ENV-BH57			
	BH5	ENV-BH58			
Temporary Storage Area	BH6	ENV-BH53			Metals[a]
	BH7	ENV-BH54			
	BH8	ENV-BH55			

of Spent Batteries					

Notes:
m bgl = meter below ground level.

(a) Heavy Metals:
For soil: Antimony, Arsenic, Barium, Cadmium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Tin, Zinc, Mercury, Chromium (III) and Chromium (VI);
For groundwater: Mercury

(b) PCR: C6 – C8, C9 – C16 and C17 – C35

(c) VOCs: For soil and groundwater: Acetone, Benzene, Bromodichloromethane, 2-Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Tetrachloroethene and Xylenes (Total)

(d) SVOCs:
For soil: Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2-ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3cd)pyrene, Naphthalene, Phenanthrene, Phenol and Pyrene.
For groundwater: Acenaphthylene, Acenaphthene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Hexachlorobenzene, Naphthalene, Phenanthrene and Pyrene.

(e) PAH:
For soil: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene
For groundwater: acenaphthene, acenaphthylene, anthracene, benzo(b)fluoranthene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene

(f) The actual sampling locations/depths are determined by on-site land contamination specialist and subject to fine adjustment due to site-specific conditions/ constraints (e.g. presence of underground utilities, foundations, presence of cobble/granite etc.) during the actual SI. Please refer to **Appendix C** for the actual sampling depths at each sampling locations.

3 LABORATORY ANALYSIS

3.1 Since the future land uses of these sites have not been determined at this stage, the most stringent set of RBRGs is recommended as the land contamination assessment criteria has been adopted as per the CAP, that is the lowest limit level for each testing parameter, as listed in Table 2.1 of EPD's *Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management*. The key chemicals of concern are metals, VOCs, PCRs and PAHs.

3.2 The soil and groundwater samples shall be sent to the HOKLAS accredited laboratory for analysis. All laboratory test methods must be accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or one of its Mutual Recognition Arrangement partners. The schedule for laboratory analysis is listed in **Table 3-1**.

Table 3-1 Laboratory Analysis Schedule

Parameters	Analytical Method	Reporting Limit for Soil (mg/kg)	Reporting Limit for GW (mg/L)	Most Stringent RBRGs for Soil Limit (mg/kg)	Most Stringent RBRGs for GW Limit (mg/L)	Soil Saturation Limit (Csat) (mg/kg)	Solubility Limit (mg/L)
Metal							
Antimony	USEPA 6020	1	-	2.91E+01	N/A	-	-
Arsenic	USEPA 6020	1	-	2.18E+01	N/A	-	-
Barium	USEPA 6020	1	-	1.00E+04	N/A	-	-
Cadmium	USEPA 6020	0.2	-	7.28E+01	N/A	-	-
Chromium (III)	USEPA 6020	1	-	1.00E+04	N/A	-	-
Chromium (VI)	USEPA Method 3060 APHA Method 3500 Cr:D	1	-	2.18E+02	N/A	-	-
Cobalt	USEPA 6020	1	-	1.46E+03	N/A	-	-
Copper	USEPA 6020	1	-	2.91E+03	N/A	-	-
Lead	USEPA 6020	1	-	2.55E+02	N/A	-	-
Manganese	USEPA 6020	1	-	1.00E+04	N/A	-	-
Mercury	USEPA 3112B	0.05	-	6.52E+00	1.84E-01	-	-
Molybdenum	USEPA 6020	1	-	3.64E+02	N/A	-	-
Nickel	USEPA 6020	1	-	1.46E+03	N/A	-	-
Tin	USEPA 6020	1	-	1.00E+04	N/A	-	-
Zinc	USEPA 6020	1	-	1.00E+04	N/A	-	-
VOCs							
2-Propanone (Acetone)	USEPA 8260	50	0.5	4.26E+03	1.00E+04	***	***
Benzene	USEPA 8260	0.2	0.005	2.79E-01	1.49E+00	3.36E+02	1.75E+03
Bromodichloro methane	USEPA 8260	0.1	0.005	1.29E-01	8.71E-01	1.03E+03	6.74E+03
2-Butanone (MEK)	USEPA 8260	5	0.05	1.00E+04	1.00E+04	***	***
Chloroform	USEPA 8260	0.04	0.005	5.29E-02	3.82E-01	1.10E+03	7.92E+03
Ethylbenzene	USEPA 8260	0.5	0.005	2.98E+02	3.91E+02	1.38E+02	1.69E+02

Parameters	Analytical Method	Reporting Limit for Soil (mg/kg)	Reporting Limit for GW (mg/L)	Most Stringent RBRGs for Soil Limit (mg/kg)	Most Stringent RBRGs for GW Limit (mg/L)	Soil Saturation Limit (Csat) (mg/kg)	Solubility Limit (mg/L)
Methyl tert-Butyl Ether	USEPA 8260	0.5	0.005	2.80E+00	6.11E+01	2.38E+03	***
Methylene Chloride	USEPA 8260	0.5	0.05	5.29E-01	7.59E+00	9.21E+02	***
Styrene	USEPA 8260	0.5	0.005	1.54E+03	1.16E+03	4.97E+02	3.10E+02
Tetrachloroethene	USEPA 8260	0.04	0.005	4.44E-02	9.96E-02	9.71E+01	2.00E+02
Toluene	USEPA 8260	0.5	0.005	7.05E+02	1.97E+03	2.35E+02	5.26E+02
Tetrachloroethene	USEPA 8260	0.1	0.005	2.11E-01	4.81E-01	4.88E+02	1.10E+03
Xylenes (Total)	USEPA 8260	2	0.02	3.68E+01	4.33E+01	1.50E+02	1.75E+02
SVOCs							
Acenaphthene	USEPA 8270	0.5	0.002	3.28E+03	7.09E+03	60.2	4.24E+00
Acenaphthylene	USEPA 8270	0.5	0.002	1.51E+03	5.42E+02	19.8	3.93E+00
Anthracene	USEPA 8270	0.5	0.002	1.00E+04	1.00E+04	2.56	4.34E-02
Benzo(a)anthracene	USEPA 8270	0.5	-	1.14E+01	N/A	-	-
Benzo(a)pyrene	USEPA 8270	0.5	-	1.14E+00	N/A	-	-
Benzo(b)fluoranthene	USEPA 8270	0.5	0.001	9.88E+00	2.03E-01	-	1.50E-03
Benzo(g,h,i)perylene	USEPA 8270	0.5	-	1.71E+03	N/A	-	-
Benzo(k)fluoranthene	USEPA 8270	0.5	-	1.14E+02	N/A	-	-
Bis(2-ethylhexyl)phthalate	USEPA 8270	0.5	-	2.80E+01	N/A	-	-
Chrysene	USEPA 8270	0.5	0.001	8.71E+02	2.19E+01	-	1.60E-03
Dibenz(a,h)anthracene	USEPA 8270	0.5	-	1.14E+00	N/A	-	-
Fluoranthene	USEPA 8270	0.5	0.002	2.27E+03	1.00E+04	-	2.06E-01
Fluorene	USEPA 8270	0.5	0.002	2.20E-01	1.00E+04	54.7	1.98E+00
Hexachlorobenzene	USEPA 8270	0.2	0.004	2.25E+03	2.34E-02	-	-
Indeno(1.2.3.cd)pyrene	USEPA 8270	0.5	-	1.14E+01	N/A	-	-
Naphthalene	USEPA 8270	0.5	0.002	8.56E+01	2.37E+01	125	3.10E+01
Phenanthrene	USEPA 8270	0.5	0.002	1.00E+04	1.00E+04	28	1.00E+00
Phenol	-	0.5	-	1.00E+04	N/A	7.26E+03	-
Pyrene	USEPA 8270	0.5	0.002	1.71E+03	1.00E+04	-	1.35E-01
Petroleum Carbon Ranges							
C6 - C8	USEPA 8260/8015	5	0.02	5.45E+02	3.17E+01	1000	5.23E+00
C9 - C16	USEPA 8260/8015	200	0.5	1.33E+03	2.76E+02	3000	2.80E+00
C17 - C35	USEPA 8260/8015	500	0.5	1.00E+04	4.93E+00	5000	2.80E+00

a) USEPA – Environmental Protection Agency of the United States
b) APHA – American Public Health Association: Standard Methods for the Examination of Water and Wastewater
Chromium III = Total Chromium – Chromium VI
* "Ceiling limit" concentration
** Soil saturation limit value exceeds the "ceiling limit" therefore the RBRG applies.
*** Solubility limit value exceeds the "ceiling limit" therefore the RBRG applies.

4 CONTAMINATION ASSESSMENT RESULTS

Summary of Samples Collected

4.1 The sampling for boreholes S1 & S2 had been conducted between 5th December 2018 to 14th December 2018 and supervised by Cinotech engaged by DSD. A total of 5 soil samples and two groundwater samples were taken within S1 & S2.

4.2 The sampling for boreholes BH1-BH8 had been conducted between 21st November 2018 to 11th December 2018 and supervised by ERM engaged by C&ED. A total of 24 soil samples and 8 groundwater samples were taken within BH1-BH8. Their findings are summarized in this CAR/RAP. During the underground utility survey, two existing sewage pipes in close vicinity of proposed location BH4 was identified, and the location of BH4 had to be relocated to approximately 3m northeast of the original proposed location to avoid any potential damage during borehole drilling. The re-located location is still located within the Area 2: Storage Area for Seized Goods and regarded as representative.

4.3 In total, 29 soil samples, 10 groundwater samples including the samples taken under QA/QC system: 3 duplicate soil samples, 1 duplicate groundwater sample and 4 field blanks, 4 equipment blanks and 13 trip blanks were taken in the Site. A summary of the borehole information, including sampling date and depth of each soil and groundwater sample is enclosed in **Appendix C**.

4.4 The soil and groundwater samples were sent to the HOKLAS accredited laboratory for analysing the key chemicals of concern as listed in Table 3-1. All laboratory test methods have been accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or one of its Mutual Recognition Arrangement partners. The reporting limit for laboratory analysis provided by ALS Technichem (HK) Pty Limited is also listed Table 3-1. According to the CAP, the most stringent set of RBRGs is adopted.

On site Observation

4.5 Before drilling, besides the oil stains, no abnormal smell and/or other trace of pollutant on the ground surfaces was observed. No discernible abnormal smell or coloured soil/rock has been observed during the SI for all of the boreholes. The photo records for boreholes and the drillhole records for S1-2 & BH1-8 can be found in **Appendix A** and **Appendix B** respectively.

4.6 As the underground of the Site is mainly consist of hard fill materials including large rock fragments, some undisturbed samples for S1 & S2 at certain levels could not be obtained despite multiple attempts have been made (please refer to **Appendix B** for the drillhole records). All boreholes have been drilled to approximately 6m bgl as per the approved sampling plan, and the final borehole depth is at least 2m below the final groundwater level. At S2, only two soil samples could be obtained as only fragmented rocks, boulder and concrete was found from 3m – 6m bgl. Therefore no further soil

samples could be collected at the proposed sampling depths of 3m and 6m bgl for S2. As no exceedance were recorded in the sampling results and no traces of contamination were detected during the borehole drilling at S2, no additional sampling at further depths is required at S2.

4.7 During the SI on-site measurements of VOC concentration have been conducted. The background VOC concentration is measured on ground level near the borehole. The VOC concentrations of the soil samples are measured within a confined air-tight plastic bag. The Photo records and the summary of VOC concentration for the on-site measurement are presented in **Appendix A**.

4.8 In general, the background VOC concentration is rather stable and mostly below 1 ppm. The VOC concentrations of the soil sample were measured at an average value of 45 ppm, however, the concentrations varied within a large range with a maximum level of up to 150 ppm. The elevated readings suggest that a small amount of VOC, above the detection limit of human, was emitted from the soil within the sample bag. However, as the measurement was made within a very small confined area and the fact that the units for PID readings is not compatible with that for RBRGs, the measured VOC could not be directly applied to the vertical VOC distribution of the boreholes. Instead, the measured values can only be served as a reference to show the range of VOC concentration emitted from the soil. The VOC sampling results produced from the HOKLAS laboratory should be adopted for the analysis. No discernible smell was recorded on-site and no exceedance of the adopted RBRG for VOC concentration in soil was recorded.

4.9 During the groundwater purging/sampling processes, no abnormal smell, color and non-aqueous phase liquid (NAPL) has been observed. The groundwater refill speed should be sufficiently high as the groundwater was refilling while the well was being purged. At least 5 well volumes of groundwater was purged and the well was allowed to stand overnight before sampling was conducted to ensure that the groundwater has been stabilised. The groundwater sample in BH1 was translucent and in light yellow colour, however, the groundwater sample in BH4 was unstained and clear. While the samples and water purged in S1 & S2 appeared slightly turbid even after sufficient purging was made. There were no presence of oil sheen, viscous liquid, petroleum or solvent odours in all groundwater samples.

Laboratory Results & Interpretation

4.10 All of the soil and groundwater samples (including duplicate samples, trip blank, equipment blank and field blanks) were delivered to ALS Technichem (HK) Pty Limited for laboratory analysis. The laboratory testing results are summarised in the **Appendix D.** The laboratory reports and chain of custody forms are enclosed in **Appendix E**. A simplified table summarising the result is presented in **Table 4-1**.

Table 4-1 Summary of Laboratory Results

Borehole	Sample ID	Sampling Dates	Exceedance of RBRGs Criteria? *				Exceedance of Csat?	Exceedance of Solubility Limit?
			Metals	PCRs	VOCs	SVOCs /PAHs		
S1	S1-1 S1-2 S1-2(Duplicate)[1] S1-3 S1-W	05 Dec 2018 - 14 Dec 2018	Nil	**S1-W (C17-C35 Fraction)**	Nil	Nil	Nil	**S1-W (C17-C35 Fraction)**
S2	S2-1 S2-2 S2-W S2-W-dup[1]	05 Dec 2018 - 14 Dec 2018	Nil	Nil	Nil	Nil	Nil	Nil
BH1	BH1-0.5m BH1-3.0-3.45m BH1-6.0-6.45m BH1-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	Nil	Nil	Nil	Nil	**BH1-GW (C17-C35)**
BH2	BH2-0.5m BH2-3.0-3.45m BH2-6.0-6.45m BH2-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	Nil	Nil	Nil	Nil	Nil
BH3	BH3-0.5m BH3-3.0-3.45m BH3-6.0-6.45m BH3-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	Nil	Nil	Nil	Nil	Nil
BH4	BH4-0.5m BH4-3.0-3.45m BH4-5.8-6.25m BH4-G.W.	21 Nov 2018 - 11 Dec 2018	**BH4 -5.8-6.25m (Lead)**	Nil	**BH4-3.0-3.45m (Tetrachloro-ethene)**	Nil	Nil	**BH4-GW (C17-C35)**

Borehole	Sample ID	Sampling Dates	Exceedance of RBRGs Criteria? *				Exceedance of Csat?	Exceedance of Solubility Limit?
			Metals	PCRs	VOCs	SVOCs /PAHs		
BH5	BH5-0.5m BH5-3.0-3.45m BH5-6.0-6.45m BH5-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	Nil	Nil	Nil	Nil	Nil
BH6	BH6-0.5m BH6 - 0.5M DUP[1] BH6-3.0-3.45m BH6-6.0-6.45m BH6-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	----	----	----	Nil	Nil
BH7	BH7-0.5m BH7-3.0-3.45m BH7-6.0-6.45m BH7-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	----	----	----	Nil	Nil
BH8	BH8-0.5m BH8 - 0.5M DUP[1] BH8-3.0-3.45m BH8-6.0-6.45m BH8-G.W.	21 Nov 2018 - 11 Dec 2018	Nil	----	----	----	Nil	Nil

* Nil indicates no exceedance is recorded

----: The parameters were not tested for the samples collected

4.11 The first soil sample for each location was collected using hand tools. Sampling for the second and third soil samples were conducted using the hammer dropping method; the groundwater sample were collected via the monitoring well after the well was sufficiently purged as stated in the approved SCAP.

4.12 The laboratory results are checked against the adopted RBRG and soil saturation limit (Csat) for soil samples and the adopted RBRG and the solubility limits for groundwater samples. For soil samples, two exceedances of the RBRG and no exceedance of the soil saturation limit was recorded. Sample BH4-5.8-6.25m was recorded with lead concentration of 1,420 mg/Kg and BH4-3.0-3.45m with Tetrachloroethene concentration of 0.09; while the RBRGs adopted for lead and Tetrachloroethene are 255 mg/Kg and 0.044 mg/Kg respectively.

4.13 For groundwater samples, one exceedance of the RBRG and three exceedance of solubility limit in the groundwater samples was recorded. The C17-C35 concentration of S1-W was recorded at 63.8 mg/L while the RBRG adopted is 4.93 mg/L.

4.14 The exceedance record is summarized in the **Table 4-2**.

Table 4-2 Exceedances of RBRGs, Csat & Solubility Limit in Soil & Groundwater Samples

Chemical	List Samples		Measured Concentration	Check if RBRG Exceeded	Check if Csat /Solubility Limit Exceeded	Approximate Size of Contamination Zone[1]
	Sample ID	Sample Depth (m bgl)				
Soil						
Metal						
Lead	BH4-5.8-6.25m	5.8-6.25m	1420 mg/kg	**YES**	-	36m²
VOC						
Tetrachloroethene	BH4-3.0-3.45m	3.0-3.45m	0.09 mg/kg	**YES**	NO	36m²
Groundwater						
PCR						
C17 - C35 Fraction	S1-W	3.60m	63.8 mg/L	**YES**	**YES**	3m³
C17 - C35 Fraction	BH1-G.W.	3.66m	2.9 mg/L	**NO**	**YES**	N/A
C17 - C35 Fraction	BH4-G.W.	2.91m	4.2 mg/L	**NO**	**YES**	N/A

*No exceedances were recorded for other chemicals tested.
N/A=Not applicable as no exceedance of RBRG and no NAPL was recorded.
[1] Further sampling is required to confirm the final extent of the contamination zone which is detailed in the RAP

4.15 Since three exceedance of the solubility limit for C17-C35 was recorded in the groundwater samples, additional field assessment to observe any visual evidence of potential NAPL occurrence is required in accordance to Step 5 of Section 3 of the RBRGs Guidance Manual. Based on the field observation results, no visual evidence of oil sheen

and petroleum odours was observed in the samples or bailer from the groundwater sampling at BH1, BH4 and S1. Hence, no NAPL was identified and no groundwater remediation is required for groundwater samples with exceedance of solubility limits. The exceedance of the RBRG in the S1-W sample was suspected to be caused by oil in an emulsified state as the appearance of the sampled groundwater remained slightly turbid even after sufficient purging was conducted.

4.16 The extent of the contamination at both S1 and BH4 shall be determined by further sampling and remediation shall be carried out accordingly. The RAP, including the determination of the contamination extent, is presented in the next section (**Sections 5**).

4.17 The soil and groundwater should be treated to satisfy the most stringent RBRGs before any construction and/or excavation works.

5 EXTENT OF CONTAMINATION

Remediation Objectives

5.1 This Remediation Action Plan (RAP) is prepared for the following objectives with reference to the "*Practice Guide for Investigation and Remediation of Contaminated Land (PG)*":

- Propose remediation/decontamination methods for the contaminated soil and groundwater where concentration of contaminants exceed the relevant RBRG limits;
- Propose procedures to confirm both the contamination extent and completed remediation/ decontamination of contaminated soil and groundwater;
- Provide guidelines for the handling and proposed on-site reuse of remediated/decontaminated soil as fill material.
- Confirmatory sampling will be necessary to confirm that all soil and groundwater with contaminants exceeding the respective RBRGs have been cleaned up.

Extent of the Contamination (S1)

5.2 The groundwater sample at S1 was found to have exceeded the RBRG for PCR (C17-C35). Since only one groundwater sample was obtained, therefore the extent of the contamination cannot be confirmed at this stage of the land contamination assessment. Based on the recorded groundwater levels from different boreholes, the boreholes located nearer to the Shing Mun River have lower groundwater levels than those away from the river, therefore it is assumed that the groundwater flow is prevailed along the direction from the Ma On Shan Road to Shing Mun River, however the groundwater flow may vary due to tidal influence. The source of the contaminant is still unknown as no exceedance was found in the soil samples and no obvious source of contaminant has been identified at this stage.

5.3 As the extent of the contamination is still unknown, a field measurement/sampling should be conducted on the purged groundwater to determine if the purged water should require treatment and if more groundwater is required to be purged. An interface probe can be used to determine if oil layer exists on top of the groundwater in the well and a Hand Held Oil in Water Analyser or an equivalent device could also be used to detect the concentration of oil in the sample on-site. As this contamination is not expected to be easily observed by the naked eye, field measurement could help identify if oil exists in the sample without the need to send the sample to a HOKLAS lab and wait for the results before the groundwater could be purged or treated. If the abovementioned measuring equipment is not readily available, sampling for lab testing is required to determine whether the purged groundwater requires treatment. However, the field measurement should be only be used as an aid to identify the contamination, final sample should still be sent to the lab for confirmation, in any case, the lab testing results should prevail over

any other form of measurements and should be deemed as the final results of the groundwater sampling.

5.4 Approximately $1m^3$ of groundwater should be purged from the well at S1 and then placed in a storage tank for treatment. The well should be allowed to stand for groundwater to recharge before purging continues. The well should be recharged within an hour according to **Section 4.9** of the CAR. A field measurement/sampling should be conducted for every $1m^3$ of purged groundwater to determine if the volume of groundwater should be treated. If field measurement or on-site observation indicates that the groundwater does not contain PCR then 3 groundwater samples shall be collected from the well for lab testing as detailed in the following sections.

5.5 Approximately one well volume of groundwater should be purged to allow fresh groundwater to be refilled and collected prior to each groundwater sampling. The samples should be collected consecutively to produce a representable sampling, that is, after the first sample is obtained, the second sample shall be obtained as soon as fresh groundwater is available again, which also applies to the third sample. If any exceedance were recorded within the 3 samples, then the procedures as stated in this Section should be repeated until 3 consecutive samples complying with RBRG could be obtained. If a 3 consecutive samples that comply with the RBRG is obtained, then this would indicate that all contaminated has already been collected. When the final extent of the groundwater contamination is defined, then no further groundwater shall be collected for treatment. The presence of any free product floating on the top of the groundwater and the thickness should be recorded. The floating layer should be removed/recovered and analysed by the laboratory.

5.6 If field measurement or on-site observation indicates that oil contamination is found, additional well volumes of groundwater should be purged or pumped out of the well for treatment until laboratory testing results for the 3 fresh groundwater samples, as mentioned in **Section 7.4**, indicate that all of the 3 samples are not contaminated.

Extent of the Contamination (BH4)

5.7 The soil sample at 3-3.45 m and 5.8 - 6.25m bgl from BH4 have exceeded the RBRGs for tetrachloroethene and lead respectively. The extent of contaminated soil at the concerned locations shall be confirmed horizontally and vertically. Horizontal extent is estimated based on an area of $25m^2$ (5m x 5m) and such area is adopted as "Initial Contaminated Area" for both contaminated soil. The vertical extent of the Initial Contaminated zones for both contaminated soil with an addition of 0.5m interval above and below each zones.

5.8 The extent of the initial contamination zone might vary subject to the results of the confirmatory sampling. In addition, uncontaminated soil is also expected between 0-2.5m bgl and 3.95 – 5.3 m bgl at BH4. Hence, the zones are categorised into three zones, namely the soil contaminated with tetrachloroethene, lead and clean soil. The location and the estimated extent of the "Initial Contaminated Zone" are shown in **Figure 5-1** and the **Table 5-1** respectively.

Table 5-1 Estimated Volumes of Initial Clean/Contamination Zone

Zone	Soil	Dimension of Initial Clean/Contaminated Zone (W x L x H)	Volume of Initial Clean/ Contaminated zone
Zone 1	Soil contaminated with tetrachloroethene (2.5-3.95m)	5m x 5 m x 1.45m	36m^3
Zone 2	Clean soil (0-2.5m & 3.95-5.3m)	5m x 5 m x 3.85 m	~96 m^3
Zone 3	Soil contaminated with lead (5.3-6.75m)	5m x 5 m x 1.45m	36m^3
Total volume of contaminated soil			~ 73m^3
Total volume of clean soil			~96 m^3
Total volume of soil required to be excavated			~169m^3

5.9 The confirmatory sampling shall be conducted at the four sides, top (centre) and bottom (centre) of the initial contamination zones 1 and 3 by means of further borehole drillings prior to the excavation of contaminated soil. Details of the confirmatory samples are list in **Table 5-2**. The locations of the confirmatory sampling station are illustrated in **Figure 5-1**.

5.10 Confirmatory samples shall be tested for the corresponding contaminants (Lead and Tetrachloromethene) as listed in **Table 5-2**. If exceedance of RBRGs is detected at any side(s) of the Initial Contaminated Zone, the Initial Contaminated Zone shall be extended for at least 1m to the side of where exceedance of RBRGs was detected. The final extent of contamination (hereafter referred as "Final Contaminated Zone") in the horizontal can only be confirmed until all confirmatory samples taken were below the RBRGs.

5.11 For the vertical extent of the Initial Contaminated Zone, confirmatory sample shall be obtained at 0.5m interval above and below the zones. Initial Contamination Zone shall also be extended for at least 0.5m above or below where exceedance of RBRGs was detected and the Final Contamination Zone can only be confirmed until all confirmatory samples taken were found below RBRGs. The details of the proposed confirmatory sampling are tabulated in **Table 5-2.**

5.12 Once the contamination extent is confirmed, the Remediation Contractor shall propose a detail excavation plan of the contaminated soil.

5.13 Considering the presence of two underground sewage pipes located at approximately 5m to 7m south of BH4, if exceedance is found at the south of the Initial Contaminated Zone and extends further south beyond the existing sewage pipes, the Remediation Contractor shall review the feasibility of adopting soil excavation for cement solidification/stabilization, including the potential impact of excavation beneath the two existing sewage pipes within the Site. If deemed necessary, the Remediation Contractor shall propose a revised remediation method for that part of contaminated soil by submitting a Supplementary RAP for EPD's endorsement prior to work. It is recommended that this soil shall be left in place to maintain the underground geotechnical stability in the vicinity of the two underground sewage pipes. Prior to any excavation works in the close vicinity of the existing sewage pipes, a details survey and subsurface clearance shall be conducted. Comments and approval shall be obtained from the relevant Government Departments, including but not limited to Drainage Service Department.

Table 5-2 Detail of Confirmatory Sample (BH4)

Zone	Sample ID^	Sampling Depth [1] [m bgl]	Testing Parameters [1]	Details
1	BH4-1T	2.5	Tetrachloroethene	Collect soil samples on the top (centre) of the Initial Contamination Zone 1
1	BH4-1N BH4-1E BH4-1S BH4-1W	3	Tetrachloroethene	Collect soil samples of the Initial Contaminated Zone at North, East, South, West respectively at the sampling depth.
1	BH4-1B	3.45	Tetrachloroethene	Collect soil samples at bottom (centre) of the Initial Contaminated Zone 1.
3	BH4-3T	5.3	Lead	Collect soil samples on the top (centre) of the Initial Contamination Zone 3
3	BH4-3N BH4-3E BH4-3S BH4-3W	5.8	Lead	Collect soil samples of the Initial Contaminated Zone at North, East, South, West respectively at the sampling depth.
3	BH4-3B	6.25	Lead	Collect soil samples at the bottom (centre) of the Initial Contaminated Zone 3.
^If further extension is necessary, the ID of the confirmatory samples shall proceed according to the pattern: BH4 1Ba, BH4-1Na, BH4-1Ea, BH4-1Sa or BH4-1Wa for zone 1 and BH4 3Ba, BH4-3Na, BH4-3Ea, BH4-3Sa for zone 3 etc. [1] Refer to Table 5-3 for the laboratory Analysis Schedule for the Sampling				

5.14 All groundwater samples should be tested for the PCR (C17-C35) and analysed for NAPL, if solubility limit is exceeded, while soil samples should be tested for lead or tetrachloroethene. The schedule for laboratory analysis and the criteria for the confirmatory sampling are listed in **Table 5-3**.

Table 5-3 Laboratory Analysis Schedule for Soil/Groundwater Confirmatory Sampling

Parameter	Referenced Analytical Method	Reporting Limit		RBRGs		Soil Saturation Limit (Csat) (mg/kg)	Solubility Limit (mg/L)
		Soil (mg/kg)	GW (mg/L)	Soil (mg/kg)	GW (mg/L)		
Metals							
Lead	USEPA Method 6020	1	-	255	-	-	-
VOC							
Tetrachloroethene	USEPA Method 8260	0.04	0.005	0.0444	-	97.1	-
PCR							
C6 – C8	USEPA Method 8260/8015	N/A	0.02	N/A	31.7	N/A	5.23
C9 – C16		N/A	0.5	N/A	276	N/A	2.8
C17 – C35		N/A	0.5	N/A	4.93	N/A	2.8
N/A=Not applicable to this assessment as no exceedance of the CoC was recorded for soil							

5.15 The confirmatory sampling requirements are summarized in the Table **5-4** as below:

Table 5-4 Summary of Confirmatory Sampling Requirements

Contamination Zone / Closure Assessment Test		Groundwater (PCR)	Soil (Lead)	Soil (VOC)
Confirmatory Sampling	Assessment Criteria	**RBRG / Solubility Limit**	**RBRG**	**RBRG**
	Sampling frequency	3 consecutive samples (purged between samples) until no exceedance of the RBRG levels are recorded	6 (1 per each side of the contamination zone, 1 on top and 1 at bottom) [1]	6 (1 per each side of the contamination zone, 1 on top and 1 at bottom) [1]

Remarks
(1) the Initial Contamination Zone shall be extended (both horizontally and vertically) until all confirmatory samples taken were below RBRGs

QA/QC

5.16 All soil and groundwater samples conducted in the Confirmatory Sampling shall be sent to the Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis. All laboratory test methods must be accredited by the HOKLAS or one of its Mutual Recognition Arrangement partners.

5.17 The following QA/QC programme shall be adopted for the soil sampling during decontamination as follows:

Samples taken under QA/QC procedures	Sampling Frequency (Confirmatory Sampling)	Testing Parameters[1]
Duplicate Sample Equipment & Field Blanks	- 1duplicate sample, 1 Equipment blank & 1 Field Blank for every 20 soil samples collected for confirmatory sampling	Tetrachloroethene / Lead
Trip Blank	1 for every trip with samples that require the analysis of VOCs	Tetrachloroethene
1. The laboratory analysis schedule for the testing parameter(s) should be referred to Table 5-3.		

5.18 The following QA/QC programme shall be adopted for the groundwater sampling during decontamination:

Samples taken under QA/QC procedures	Sampling Frequency (Confirmatory)	Testing Parameters [1]
Duplicate	- 1duplicate sample, equipment and Field blanks for every 20 GW samples	C17 – C35
Equipment blank		
Field Blank		
Trip Blank	1 for every trip with samples that require the analysis of VOCs	Tetrachloroethene
1. The laboratory analysis schedule for the testing parameter(s) should be referred to Table 5-3.		

6 Remediation Methods – Comparison & Evaluation

6.1 The remedial options evaluation has been conducted in order to determine the most appropriate remedial strategy across the Site for the identified contaminated soils and groundwater, from a technical, environmental and legislative standpoint. With cognisance given to the identified Contaminant of Potential Concern (COPC), remediation options were evaluated for their appropriateness and application at the Site. The comparison and evaluation of soil and groundwater remediation options are presented in **Table 6-1** & **Table 6-2** and the following sections.

Table 6-1 Recommended Remediation Options (Soil)

Remediation Method	Descriptions	Applicability	Limitations/Remarks
Soil			
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 small volume of contaminated soil • Applicable to all waste or mixture that meet land disposal restriction treatment standards. • Common practice for shallow, highly-contaminated soils.	• Pre-treatment may be required for contaminated soil to meet landfill disposal criteria (TCLP) • Landfill space limited and valuable. • Need to import clean backfill materials • Least desirable management option.
Soil Washing	The soil/rocks is washed through water-based solution containing surfactant to dissolve and extract the contaminant from the soil/rocks, if lead is also required for treatment, cleating agent such as EDTA should also be applied in the washing. The wastewater generated from the washing shall be treated before discharging to the public sewers.	• Applicable for treating soil with low humic content and heavy metals • Soil & water can be reused.	• Requires large Site for equipment. Soils can be reused except small residue which requires disposal. • This method is less common in HK • Pre-treatment may be required in treating soil with high amount of silt and clay • Cost-intensive
Biopiling	The contaminated soils are accumulated into piles and then simulating aerobic microbial activity by aeration and the addition of minerals, nutrients, and moisture. The biopiles are usually covered with tarpaulins to prevent runoff, evaporation and volatilisation. The gas emitted from the biopiles are treated for VOCs before being discharged.	• Effective in treating total petroleum hydrocarbons (PCR/TPH) and nonhalogenated VOCs • Most cost-effective for large volumes of contaminated soil system	• Labour intensive • Time consuming • Large space required for biopile construction • Cannot treat inorganic contaminants such as heavy metals , therefore if treatment for lead is required, cement solidification/stabilisation opt as a post-treatment • Not effective in treating Large objects, which should be filtered out from the compound for alternative

Remediation Method	Descriptions	Applicability	Limitations/Remarks
			treatment such as soil washing
Cement Solidification/ Stabilisation	Solidification/stabilisation reduces the mobility of hazardous substances and contaminants in the environment through both physical and chemical means. The contaminated soil can be mix with cement, water, sands and aggregates to create	• Effective in treating inorganic materials such as heavy metals • Limits the solubility or mobility of the contaminants in the solidified mixture.	• The effectiveness is reduced with the presence of organic materials • Cannot treat organic materials

Table 6-2 Recommended Remediation Options (Groundwater)

Remediation Method	Descriptions	Applicability	Limitations/Remarks
Groundwater			
Air Sparging	*in situ* technology in which air is injected into the subsurface saturated zone to remove the contaminants dissolved in groundwater	• The target contaminant groups are VOCs and fuels. • Implemented with minimal disturbance to site operations • Requires no removal, storage, or discharge considerations for groundwater.	• Cannot be used if free product exists. • Requires detailed pilot testing and monitoring to ensure vapor control and limit migration. • Air injection wells must be designed for site-specific conditions. • Stratified soils may cause air sparging to be ineffective. • May not be effective for treating PCR with high carbon chain (heavy oil) or PCR
Recovery Wells/ Trenches	Free product is recovered from a pit or trench without recovering groundwater	• Applicable to settings in which the amount of free product is small and exists in permeable conduits such as utility bedding or buried underground open structures • Low cost and simple operation and maintenance • Ideal for shallow groundwater level and soil excavation works	• Recovery rates depend on pit/trench size • Frequent media replacement • Requires manual adjustment

Remediation Method	Descriptions	Applicability	Limitations/Remarks
Groundwater			
Ex-situ Chemical Methods	Include chemical oxidation, dehalogenation, solvent extraction, etc. Using chemicals to remove pollutants in groundwater.	• A wide range of contaminants are treatable. • Destroys pollution *in situ* without having to pump it out for transport to a treatment system. • Relatively low cost	• Chemicals used are site specific and depend on the contaminants present. Very specialized contractors required. • Need to remove the additional chemicals from the water • May require handling of large quantity of hazardous oxidizing chemicals.
Bioremediation	Involves the encouragement of indigenous bacterial populations to metabolize target contaminants through the addition of various amendments (biostimulation) to the subsurface environment	• Can reduce the concentration of the contaminant to a very low level	• Time-consuming • Require experience in handling the bacteria
Oil/water Separation	Separate oil and suspended solids from the groundwater using the method of flotation and sedimentation	• Low cost • Do not require complicated construction	• May not be effective if oil droplets are very small
Discharge to foul sewer	No treatment is involved	• This is only suitable for disposing wastewater with very low concentration of contaminant and at a very low flow rate in accordance to an appropriate discharge licence and discharging criteria	• The contaminant is not removed from the Groundwater with this method

Remediation Method for Contamination at S1

6.2 Since no NAPL was identified during the on-site observation, the method of recovery the free products on the groundwater would not be applicable in this case.

6.3 The contaminant in groundwater from S1 that was found to have exceeded the RBRG was PCR(C17-C35), therefore air sparging would not be very effective in treating the contaminated groundwater, according to **Table 6-2**.

6.4 Based on the on-site observation and the lab testing results, the oil contaminant in the groundwater sample from S1 is considered to be in an emulsified state as no NAPL was observed and oil was suspected to be existing as oil droplets, which is difficult to be seen with the naked eyes. Chemical methods such as adding surfactant could potentially remove oil contaminant from a host. However since groundwater is the host in this case, the addition of surfactant would intensify the emulsion of the oil in the groundwater and would also result in a collateral contaminant in the treated groundwater. On the other

hand, chemicals such as non-ionic coagulant could break the oil emulsion and help to coalesce the oil droplets. However, the breaking of the emulsion alone is not effective in treating the contaminated groundwater in S1.

6.5 Most oil should be able to be separated out from water naturally. Therefore, usually in a flotation tank, if enough retention time was given, the oil should rise to the surface forming an oil/scum layer, which can then be removed by skimming. However, if the oil droplets are small, then the flotation of the oils would require long time to achieve the required liquid/oil phase separation and treat the contaminant in the groundwater to below the RBRG. In this case, chemical such as coagulant can added to accelerate the floatation/sedimentation process as stated in **Section 6.4**. Since the size of the oil droplets are still unknown, therefore a pilot test or more commonly known as a jar test can be performed on a sample of the contaminated groundwater prior to the detail design of the treatment. Based on the result of the Jar Test, a simplified oil/water separator can be constructed for treating the groundwater using the flotation process. The outline process for this treatment is discussed in **Section 7**.

Remediation Method for Contamination at BH4

6.6 With reference to the remediation options provided in **Table 6-1**, as the contamination at BH4 is expected to be localized, cement solidification / stabilization followed by on-site backfilling would be an appropriate remediation approach for the heavy metal-contaminated soil and hence adopted in this RAP. As for soil that are contaminated with VOCs, biopiling should be effective in treating the soil when treatment volume is sizable.

7 OUTLINE OF REMEDIATION PROCESS

Remediation Process for S1

7.1 As mentioned in **Section 6**, a simplified oil/water separator should be constructed for treating the contaminated groundwater. The remediation process should be supervised by a land contamination specialist. The specialist should determine based on the on-site observation which remediation option should be carried out and whether it is carried out effectively. The specialist should also identify if additional treatment is required.

7.2 Prior to the treatment, a Jar Test should be performed to assess the time required for the flotation to complete. If no or very little changes could be observed after hours or even after 1 day of the test, then coagulant should be introduced and mixing should be provided for the effect to take place. Coagulant such as Polyamine, PolyDADMACs, Polyaluminum Chloride (PAC) could be used to coalesce oil droplets. The results of the Jar Test should be recorded in detail in order to provide the design parameters. The oil layer on top should be skimmed and should be handled according to **Section 7.19**. The groundwater should be pumped/purged into sedimentation tank at the designed flow rate.

7.3 Under the appropriate hydraulic retention time, the oil is expected to float on top for removal and the sludge shall be accumulated at the bottom for later removal. The treated water should be overflown to another tank from the flotation/sedimentation tank. A schematic diagram of the set-up for the proposed remediation method is shown in **Figure 7-1**.

7.4 The flotation/sedimentation tank should be designed for handling the amount of groundwater that requires sufficient retention time for completing the flotation/sedimentation processes. The following table summarises the typical design parameters or requirements for a flotation/sedimentation tank:

Table 7-1 Typical Values of Design Parameters for the Flotation/Sedimentation Tank

Design Parameters	Typical Values
Overflow rate S [m/hr]	0.2 – 1
Retention Time [s]	1-3 hrs
Length/width ratio	3-8
Depth [m]	1.5 m

7.5 If the oil droplets are relatively large (i.e. > 50 micron), then the hydraulic retention time required for flotation process may be able to complete within 2 to 3 hours. However, the Remediation Contractor should provide a detail design for the proposed Flotation/Sedimentation Tank.

7.6 Samples from the treated groundwater from the final tank shall be collected to confirm the treatment quality. A sample for every $1m^3$ of treated groundwater should be obtained to determine if the groundwater is treated to below RBRG. The samples shall be collected once they are being treated. If exceedance was found, the water shall be re-treated until at least 3 samples of the treated groundwater are tested with levels below RBRG or

solubility limit. If exceedances of solubility limit were recorded in the groundwater samples, additional field assessment to observe any visual evidence of potential NAPL occurrence is required in accordance to Step 5 of Section 3 of the RBRGs Guidance Manual to determine whether NAPL is present; if NAPL exists, then the groundwater should be treated to lower of RBRG or solubility limit. As the remediation period is expected to be short, the closure assessment shall be conducted directly after the treatment and no progress monitoring is required.

Remediation Process for BH4 (Lead)

7.7 The following outline of the remediation process for BH4 has been proposed:

7.8 The soil from zone 3 Pilot testing will be conducted prior to solidification/stabilization (S/S) to determine the optimal mixing ratio of binding agents and contaminated soil for meeting the treatment target as detailed in the sections below. The ratios and procedures to be tested in the pilot shall be proposed by the Remediation Contractor.

7.9 The asphalt slab on top of the soil shall be penetrated and removed with a handheld drill or equivalent before the excavation. The presence of underground utilities shall be identified by the contractor prior to remediation works. A hand shovel shall be used to excavate the soil within 1.0 m of underground utilities to avoid damage. As the contamination zone is located below groundwater table, sheet piling and proper de-watering measures shall be in place before the excavation. Contaminated soil will be excavated mainly with appropriate earthmoving equipment such as excavators. Dust will be well controlled by the use of water sprays and other standard construction techniques. Workers, vehicles, instruments, and equipment will be decontaminated before leaving the site.

7.10 The contaminated material intended for S/S shall be excavated and placed in stockpiles in an assigned area with warning signs posted. The stockpile will be provided with drainage diversions to prevent surface water runoff from entering the stockpile and entraining contaminants in the flow. The stockpile will also be covered with impervious sheet to prevent wind erosion or rainfall percolation. In addition, silt fences or purpose-built bund walls will be used to prevent the release of sediment-laden rainwater from the stockpile area.

7.11 Oversize boulder (i.e. excavated material with >50mm diameter) within the extent of contaminated soil, if any, will be screened out during excavation. Since the oversize boulder is unlikely to be contaminated by heavy metals, and cement S/S is not applicable for the oversize material, steam-clean at 60°C for the material surface to remove surface contaminants and backfill with other cement S/S soil will be applied instead.

7.12 S/S soils are required to comply with Toxicity Characteristic Leaching Procedure (TCLP) and unconfined compressive strength (UCS) tests requirements.

7.13 The exact locations, depths and ultimate volume of the buried solidified product shall be presented in Remediation Report.

Remediation Process for BH4 (VOC)

7.14 Contaminated soils shall be excavated from the proposed contamination zone and placed uniformly on a layer of High-density polyethylene (HDPE). A pre-treatement shall be first conducted to remove large rocks or debris from the soil to prevent hindrance during the biopiling.

7.15 The soils contaminated with VOC are placed from one end to the other end along the longitudinal axis of pile, perforated pipes (for air extraction) of 80-100mm diameter, closed at one end, will be placed in the traverse direction of the soil pile with sufficient horizontal spacing, and a vertical distance of 2m above the base of pile. Concurrently, perforated pipes (for air intake) shall be placed above and below the extraction pipes. The air intake pipes will penetrate through the pile cover (LDPE) for suction of fresh air.

7.16 Nutrient will be introduced and water will be added to maintain the moisture contents between 20-60% to maintain the proliferation of the microorganisms in the biopile. Irrigation of the soils by recirculation of the leachate from the collection sump will be made where necessary. The extraction pipes are connected to a header pipe varying in diameter. Pipe hangers will be provided to maintain the pipes in position. Two piles will be served by one biopile mechanical system which comprises one set of blower for oxygen supply and activated carbon filter to remove VOC from the exhaust of the biopile. The detailed and exact technical figures will be provided in detail design stage. A low-density polyethylene (LDPE) sheeting will be used to cover the biopile during the decontamination process to prevent the ingress of rain. A schematic diagram of the proposed set-up of a biopile is shown in **Figure 7-2**.

7.17 To prevent soil from clogging the aeration pipes and to extend the aeration zone, a 50mm layer of rounded pea gravel will be placed over the aeration pipes, and the excavated soil is then placed over on the gravel. No heavy plant and equipment are permitted to run over the soils to ensure the soils are loosely placed.

7.18 Drainage channel will be constructed around the pile to collect leachate which will finally drain to a leachate collection sump. Water treatment will be implemented if necessary.

7.19 Since biopile treatment process may take up to a few months before completion, progress monitoring shall be provided to ensure that the design parameters are effective for the treatment of the VOC contaminated soil. Soil gas monitoring points shall be installed within the biopiles, as shown in **Figure 7-2**, and soil gas samples are taken by pulling a gas sample from the monitoring points through a vacuum pump. Sampling of oxygen, carbon dioxide, methane, carbon monoxide and VOC concentrations in the soil gas should be conducted once every month. In addition, soil sampling for the analysis of pH, nutrients, and bacterial number may be conducted where necessary.

7.20 At least once a month during the remediation, one sample per $10m^3$ of the biopile should be taken to monitor the progress of the remediation. The remediation shall be considered completed until three samples with tetrachloroethene levels measured at below the RBRG is recorded.

Equipment Decontamination

7.21 All equipment and tanks employed for sample handling, storage and treatment should be decontaminated before and after collection of each sample to minimize the potential of cross-contamination between sampling locations and depths. The following is the standard procedure for cleaning drilling equipment and sampling equipment on site:

i) Clean with steam or lab-grade detergent (using brush if necessary) to remove particulate matter and surface films.

ii) Rinse thoroughly with distilled water for all equipment used in treatment and sampling, especially the tank for storing treated soil groundwater.

iii) After field cleaning, the equipment shall be handled by personnel wearing disposable latex gloves to avoid the transfer of contaminants from other sources. If the equipment is not to be used immediately it should be covered with clean plastic sheeting or wrapped in aluminium foil to avoid re-contamination. Also, provisions should be made to handle any decontamination fluids.

iv) The sampling equipment (Driller & Bailer or water pumps) shall be cleaned according to the above procedures between each sampling.

Cross-contamination Prevention

7.22 Prior to the treatment, the soil from different zones, namely zone 1, 2 and 3 should be excavated and stored at different designated location on-site with clear labelling respectively. During the excavation of clean soil, the excavation tools should not reach the soil within ~0.3m away from the contamination area to avoid contaminating the equipment. After the clean soil is removed and placed at a designated area, the contaminated soil should be removed from the contamination area as shown in **Figure 5-1** and then be placed at another designated area.

7.23 To prevent potential cross contamination from surface runoff and dust emission, the stockpiled soil / biopile from zone 1, which requires prolonged treatment in an enclosed environment, shall be surrounded by bund wall and covered by impervious sheeting. The temporarily stockpiled soil from both zone 2 and zone 3 shall be surrounded by sandbags/water absorbing material and covered by impervious sheeting. The excavated soil from zone 2 should be backfilled as soon as all contaminated soil from zone 1 and 3 are removed to minimise the stockpile areas on Site. The designated areas for the soil at different zones must be distinguished by clear labelling and provided with sufficient spatial separations, approximately 10m, to prevent cross-contamination. The locations of the designated areas and the proposed mitigation measures for cross-contamination are illustrated in **Figure 7-3**.

7.24 In addition, the equipment should be decontaminated properly, as stated in Section 7.21, after handling the contaminated soil and prior to the handling of clean soil.

8 CLOSURE ASSESSMENT & POST-REMEDIATION

8.1 The Section is presented to detail the closure assessment, as mentioned in **Sections 5-7** which should be conducted to ensure that all contaminated soil/groundwater are excavated or purged and treated for the CoCs to below RBRG levels (most stringent criteria is adopted unless the land use can be specified).

8.2 The schedule for laboratory analysis and the criteria for the closure assessment are listed in **Table 8-1**.

Table 8-1 Laboratory Analysis Schedule for Soil/Groundwater Closure Assessment

Parameter	Referenced Analytical Method	Reporting Limit		RBRGs		Soil Saturation Limit (Csat) (mg/kg)	Solubility Limit (mg/L)
		Soil (mg/kg)	GW (mg/L)	Soil (mg/kg)	GW (mg/L)		
Metals							
Lead	USEPA Method 6020	1	N/A	255	N/A	-	N/A
VOC							
Tetrachloroethene	USEPA Method 8260	0.04	N/A	0.0444	N/A	97.1	N/A
PCR							
C6 – C8	USEPA Method 8260/8015	N/A	0.02	N/A	31.7	N/A	5.23
C9 – C16		N/A	0.5	N/A	276	N/A	2.8
C17 – C35		N/A	0.5	N/A	4.93	N/A	2.8
- : No values are available in Table 2.1 & 2.2 of the GM for Use of RBRG for Contaminated Land Management N/A : Not applicable for this assessment							

Groundwater Closure Assessment

8.3 Upon completion of treatment (**Section 7**), samples from the treated groundwater from the final tank containing the treated groundwater shall be collected to confirm the treatment quality. A sample for every $1m^3$ and at least 3 samples of well-mixed treated groundwater should be obtained to determine if the groundwater is treated to below RBRG. The groundwater treated to the adopted RBRG levels should be discharged to the ground through the existing boreholes.

Biopile Closure Assessment

8.4 Biopile closure assessment should be conducted to ensure that the soil contaminant levels in the biopile are meeting the treatment target for Tetrachloroethene, as listed in **Table 8-1**. With reference to previous land remediation projects in Hong Kong and the scale of contamination, a sampling frequency of 1 sample per $10m^3$ for biopile closure assessment is recommended. A biopile with a volume greater than $50m^3$ should first be evenly divided into lots (according to volume, height or width, for example) for sampling and testing for contaminants. These lots and the sampling locations within the biopile shall be documented accurately. It should be noted that remediation could discontinue only if all samples meet the clean-up target in 3 consecutive rounds of sampling for the closure assessment.

8.5 The sampling locations should be accessed through the opening of heat bonded cover panels. These openings shall be closed after each access. Extracting these soil samples should be accomplished using a hand auger or other methods approved by the Engineer. The actual sampling locations should be determined by the on-site Land Contamination Specialist subject to actual site condition and engineering constraints

8.6 All soil samples shall be analysed for Tetrachloroethene. The treatment of the contaminated soil is considered properly treated when the laboratory results of the representative soil samples taken from the treated soil have met the RBRGs. When this is achieved for all soil lots, the soil should only then be removed from the biopile for subsequent designated use or on-site backfilling.

On-site Backfilling / Public Fill for Cement Solidified Soil

8.7 According to the Practice Guide, agreement with EPD should be obtained regarding the criteria for treated soil from cement solidification decontamination method which is intended to be reused on-site as fill material. The Universal Treatment Standards (UTS), as presented in **Table 8-2** is proposed as suitable criteria. Since only those metals where exceedance of RBRGs was recorded are required to be tested, conducting TCLP for lead only shall be sufficient. In addition, the treated soil should comply with other applicable standards, such as the Unconfined Compressive Strength (UCS) standard of not less than 1 MPa which is described in the USEPA's Handbook for Stabilisation/Solidification of Hazardous Wastes (EPA/540/2-86/001, 1986). It is proposed that a sampling frequency of 1 sample per $10m^3$ of treated soil be collected for testing to confirm the compliance with the UTS and UCS standard.

Table 8-2 On-site Backfilling Criteria for Remediated Soil

Parameter	Acceptance Criteria
Toxicity Characteristics Leaching Procedure (TCLP) Test – Lead	0.75 mg/L
Unconfined Compressive Strength (UCS)	≥ 1MPa

8.8 All the materials after confirmation of decontamination shall be reused on-site.

8.9 All soil requiring decontamination would be treated to the most stringent RBRGs (i.e. most stringent criteria is adopted unless the land use can be specified). No off-site soil disposal at landfill is proposed for this works. On-site equipment, machineries and vehicles used in the land decontamination works should be properly decontaminated before leaving the Project site.

8.10 Upon completion of the cement S/S process and with passing results of TCLP and UCS tests, the solidified product could be backfilled at the locations within the site boundary, such that the solidified product is:

- Located under a layer of clean fill of at least 0.5m thick (excluding any

underground utilities);
- At a horizontal distance of more than 30m away from any stream or watercourse; and
- Broken into materials of a maximum size of 250mm for backfilling
- Not used for any structural or landscaping purposes.

Summary of Closure Assessment

8.11 The sampling requirements and schedule for this closure assessment are summarized in **Table 8-3**.

Table 8-3 Summary of Closure Assessment

Contamination Zone / Closure Assessment Test		Groundwater (PCR)	Soil (Lead)	Soil (VOC)
Sampling of Treated Soil/GW	Assessment Criteria	**RBRG & Solubility Limit**	**UTS & UCS**	**RBRG**
	Sampling frequency[1]	1 sample per every 1m^3 of treated groundwater	1 sample per every 10m^3 or batch	1 sample per every 10m^3 for at least three consecutive rounds of sampling

Remarks
(1) At least 3 samples will be taken for both soil and groundwater samples.

QA/QC

8.12 All soil and groundwater samples conducted in Remediation Progress Monitoring and Closure Assessment shall be sent to the Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis. All laboratory test methods must be accredited by the HOKLAS or one of its Mutual Recognition Arrangement partners.

8.13 The following QA/QC programme shall be adopted for the soil sampling during decontamination as follows:

Samples taken under QA/QC procedures	Sampling Frequency (Remediation)	Testing Parameters[1]
Duplicate Sample, Equipment & Field Blank	-1 Duplicate Sample, Equipment & Field Blank for every 20 samples collected for TCLP tests	lead
	-1 Duplicate Sample, Equipment & Field Blank for every 20 samples collected for closure assessment in Biopile	Tetrachloroethene
Trip Blank	1 for every trip with samples that require the analysis of VOCs	Tetrachloroethene
1. The laboratory analysis schedule for the testing parameter(s) should be referred to Table 8-1.		

8.14 The following QA/QC programme shall be adopted for the groundwater sampling during decontamination:

Samples taken under QA/QC procedures	Sampling Frequency (Remediation)	Testing Parameters[1]
Duplicate sample, Equipment blank Field Blank	1 Duplicate sample, Equipment blank Field Blank for every 20 samples of treated GW samples collected	C17 – C35
1. The laboratory analysis schedule for the testing parameter(s) should be referred to Table 8-1.		

Chemical Waste Disposal

8.15 All oil removed during the treatment should be handled according to the Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C) and suitable containers should be provided on-site for storing the chemicals.

Implementation

8.16 The remediation works specified above will be carried out upon the approval of this CAR-RAP by EPD. Remediation Specialist will provide necessary site supervision on remediation preparation, cement S/S process and oil/water separation process if applicable. The Specialist should also supervise the confirmation sampling and sampling of solidification product for TCLP and UCS tests and the treated groundwater.

8.17 After the completion of oil/water separation for the contaminated groundwater at S1 and cement S/S or biopiling for the contaminated soil identified at BH4, a Remediation Report (RR) shall be prepared and submitted to EPD by the Remediation Specialist to detail the remediation process and that the contaminated soil has been treated properly to meet the corresponding treatment targets. The Remediation Report shall include but not limited to the following information:

- Background information, including background of the project, regulatory and other requirements, site future land use and land use scenarios, summary of onsite contamination;
- Information demonstrating that the proposed soil remediation has been carried out properly and satisfactorily in accordance with the CAR-RAP;
- Description of remediation programme carried out including additional investigation, pilot testing, remediation (e.g. % of cement used, number of days required for the solidification process, etc.), monitoring and measurements, decommissioning of plants and equipment (if applicable);
- Confirmatory sampling, Remediation monitoring and closure assessment results including field observations, samples laboratory reports, QA/QC results;
- Photos showing the area of excavation, the solidification process, remediated soil, and onsite backfill location for reference; and
- Conclusion and recommendations (if applicable).

9 CONCLUSION

CAR

9.1 In accordance to the approved SCAP, the sampling works for boreholes S1 & S2 was collected and supervised by Cinotech, while the sampling for boreholes BH1-BH8 was conducted and supervised by ERM.

9.2 The most stringent set of RBRGs have been adopted for this assessment and the laboratory results for the sampling works show that there are three exceedances of the adopted RBRGs. The first exceedance is identified in the ground water sample for borehole S1 (S1-W). The C17-C35 concentration of S1-W is 63.8 mg/L. The second and third exceedances are identified in the soil sample for borehole BH4 at 5.8m-6.25mbgl with lead concentration of 1,420 mg/Kg and BH4-3.0-3.45m with tetrachloroethene concentration of 0.09mg/Kg.

9.3 The extent of the contamination at both S1 and BH4 shall be determined by further sampling for confirmation and remediation shall be carried out accordingly. The method for determination has been discussed in the RAP.

RAP

9.4 Based on the on-site observations and preliminary assessment for the contamination extent, the extent for contamination hotspots at S1(PCR) and BH4 (lead & Tetrachloroethene) are not expected to be significant as only one sample with exceedance for each type of contamination was found within one borehole in each of the two hotspots.

9.5 Based on the recorded groundwater levels from different boreholes, the groundwater flow is prevailed along the direction from the Ma On Shan Road to Shing Mun River, however the groundwater flow may vary due to tidal influence. Since only one sample was obtained at S1, therefore the extent of the contamination for the groundwater cannot be confirmed at this stage of the sampling works. The source of the contaminant is still unknown as no exceedance was found in the soil samples and no obvious source of contaminant has been identified at this stage. Further sampling is required to confirm the extent of the contamination. 3 consecutive groundwater samples at S1 shall be collected to confirm the extent and groundwater should be purged sufficiently to allow fresh groundwater to be refilled and collected prior to each groundwater sampling. If any exceedance were recorded within the 3 samples, then the procedures should be repeated until 3 consecutive samples complying with RBRG could be obtained. The 3 samples would define the final extent of the contamination.

9.6 The extent of contaminated soil at BH4 shall be confirmed horizontally and vertically. Horizontal extent is estimated based on an area of $25m^2$ (5m x 5m) and such area is adopted as “Initial Contaminated Zone”. All confirmatory samples shall be tested for the corresponding contaminants (Lead or Tetrachloroethene) as illustrated in **Table 5-2**. If exceedance of RBRGs is detected at any of the sides of the Initial Contaminated Zone, the Initial Contaminated Zone shall be extended to at least 1m horizontally and 0.5m vertically above and below from where the exceedance of RBRGs was detected. The final

extent of contamination (hereafter referred as "Final Contaminated Zone") can only be confirmed until all confirmatory samples taken were below the RBRGs.

9.7 The remedial options evaluation has been conducted in order to determine the most appropriate remedial strategy across the Site for the identified contaminated soils and groundwater.

9.8 A physical/chemical method such as flotation process has been proposed for treating the groundwater via a simplified oil/water separation. Since the size of the oil droplets are still unknown, therefore a pilot test or more commonly known as a jar test can be performed on a sample of the contaminated groundwater prior to the detail design of the treatment. The outline process for this treatment is discussed in **Section 7**.

9.9 The flotation/sedimentation tank should be designed for handling the amount of groundwater that requires sufficient retention time for completing the flotation/sedimentation processes.

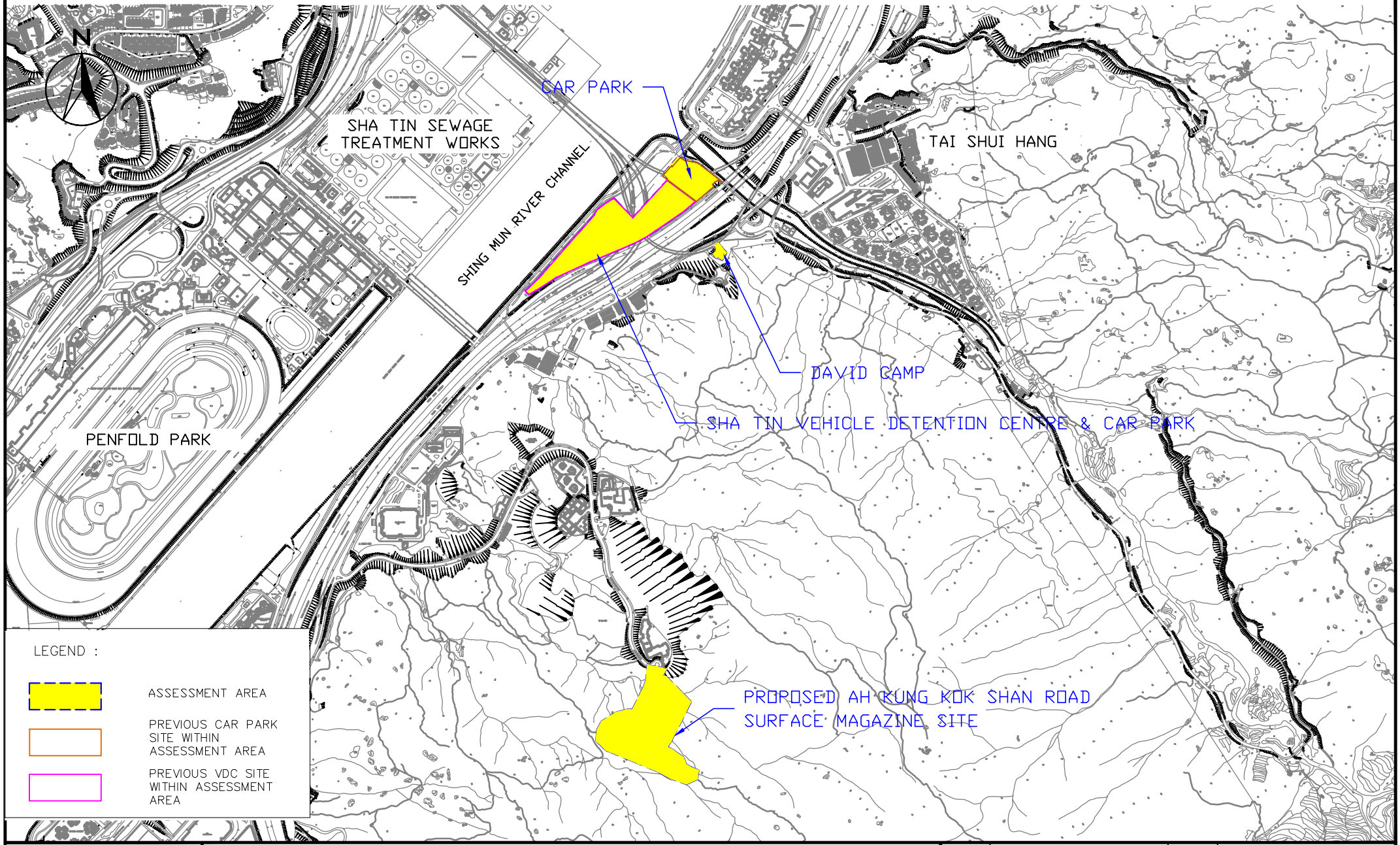
9.10 The lead-contaminated soil in BH4 is expected to be localized, cement solidification / stabilization followed by on-site backfilling would be an appropriate remediation approach for inorganic contamination while the tetrachloroethene contaminated soil shall be treated by biopiling which is effective in treating VOC and adopted in this RAP.

9.11 Pilot testing will be conducted prior to both S/S and biopiling to determine the optimal mixing ratio of binding agent and the biological contaminated soil. The ratios and procedures to be tested in the pilot shall be proposed by the Remediation Contractor. S/S soils are required to comply with TCLP and UCS tests requirements.

9.12 Remediation Contractor should provide a detail design for the proposed remediation works, specified in Section 7, which would be carried out upon the approval of this CAR-RAP by EPD. Remediation Specialist will provide necessary site supervision on remediation preparation, cement S/S process, oil/water separation process. The Specialist should also supervise the confirmation sampling and sampling of solidification product for TCLP and UCS tests and the treated groundwater.

9.13 After the completion of cement S/S or biopiling for the contaminated soil identified at BH4 and oil/water separation for the contaminated groundwater at S1, a Remediation Report (RR) shall be prepared and submitted to EPD by the Remediation Specialist to report the remediation process and that the target contaminant has treated with the use of proper method and the result is able to meet the corresponding RBRGs. It should be noted that no construction works should be carried out in all stockpiling areas, treatment areas and contamination areas prior to the agreement of RR and appropriate precautionary measures should be proposed to prevent any possible cross-contamination.

FIGURES



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Cinotech Consultants Limited

Contract No. SPW 09/2018
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

LAND CONTAMINATION ASSESSMENT AREA PLAN

SCALE	1:30000@A4	DATE	NOV 2018
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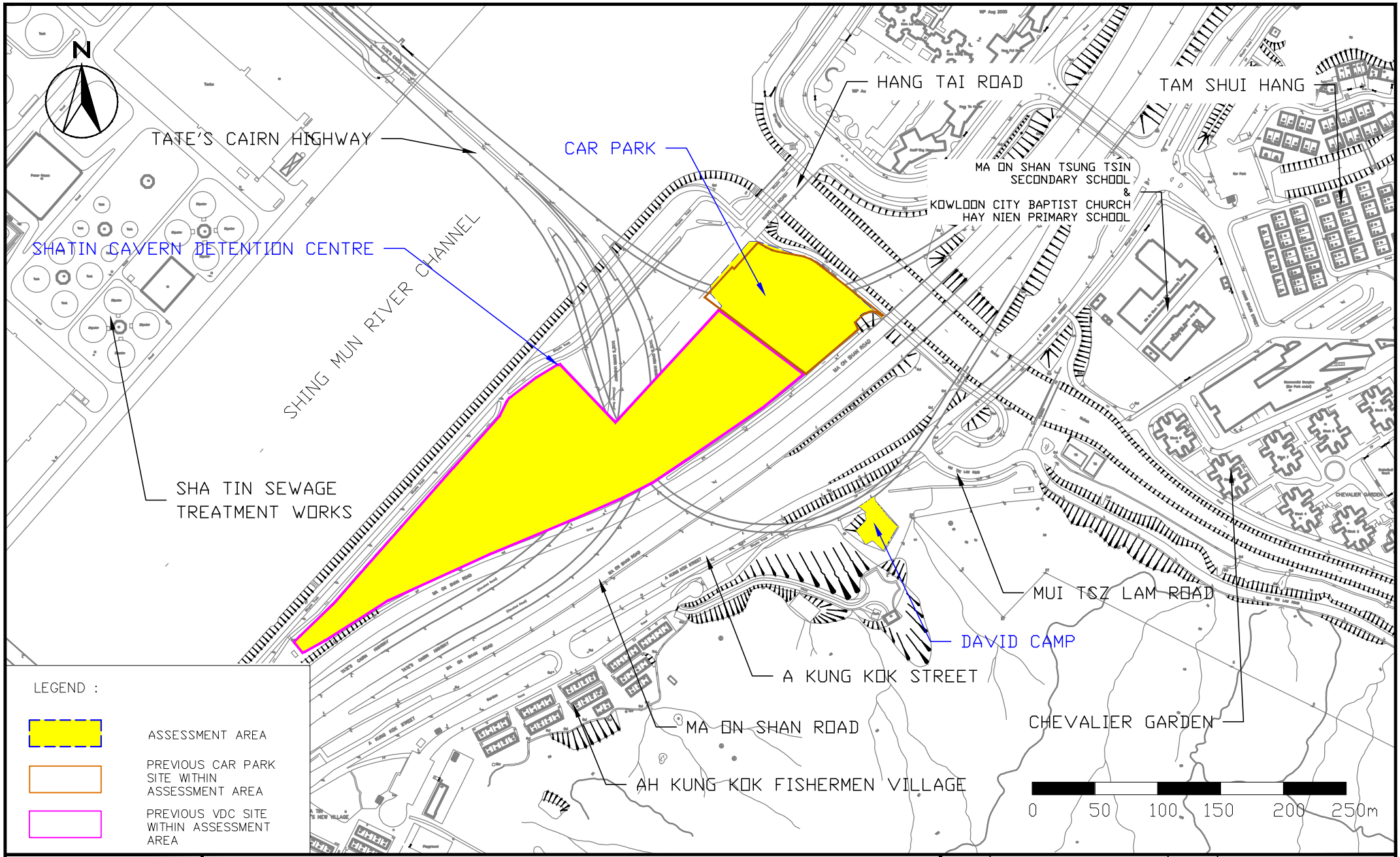
JOB No.	IA18064	FIGURE NO.	1a
		REV	1



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Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

LAND CONTAMINATION ASSESSMENT AREA PLAN

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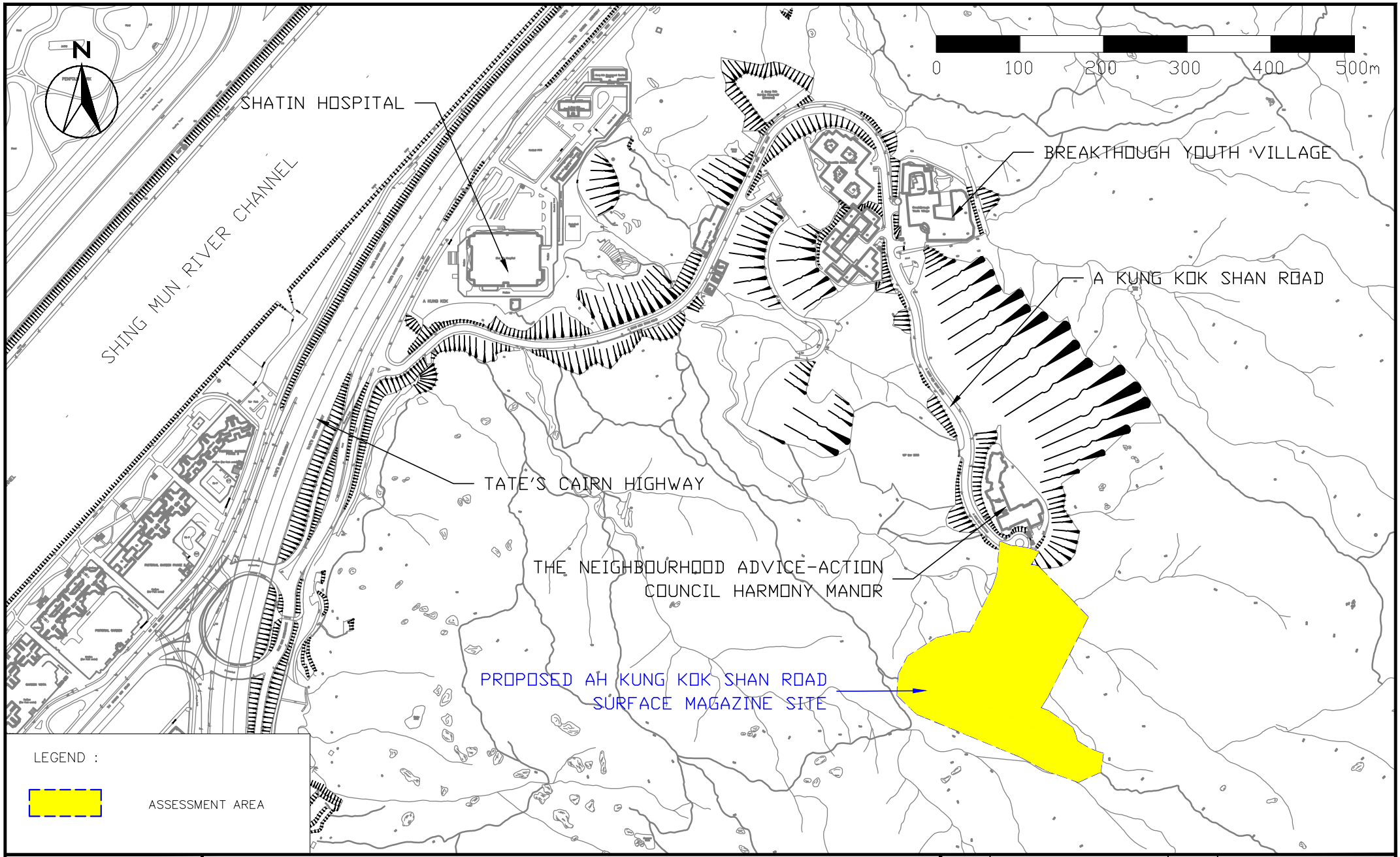

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Contract No. SPW 09/2018
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

LAND CONTAMINATION ASSESSMENT AREA PLAN

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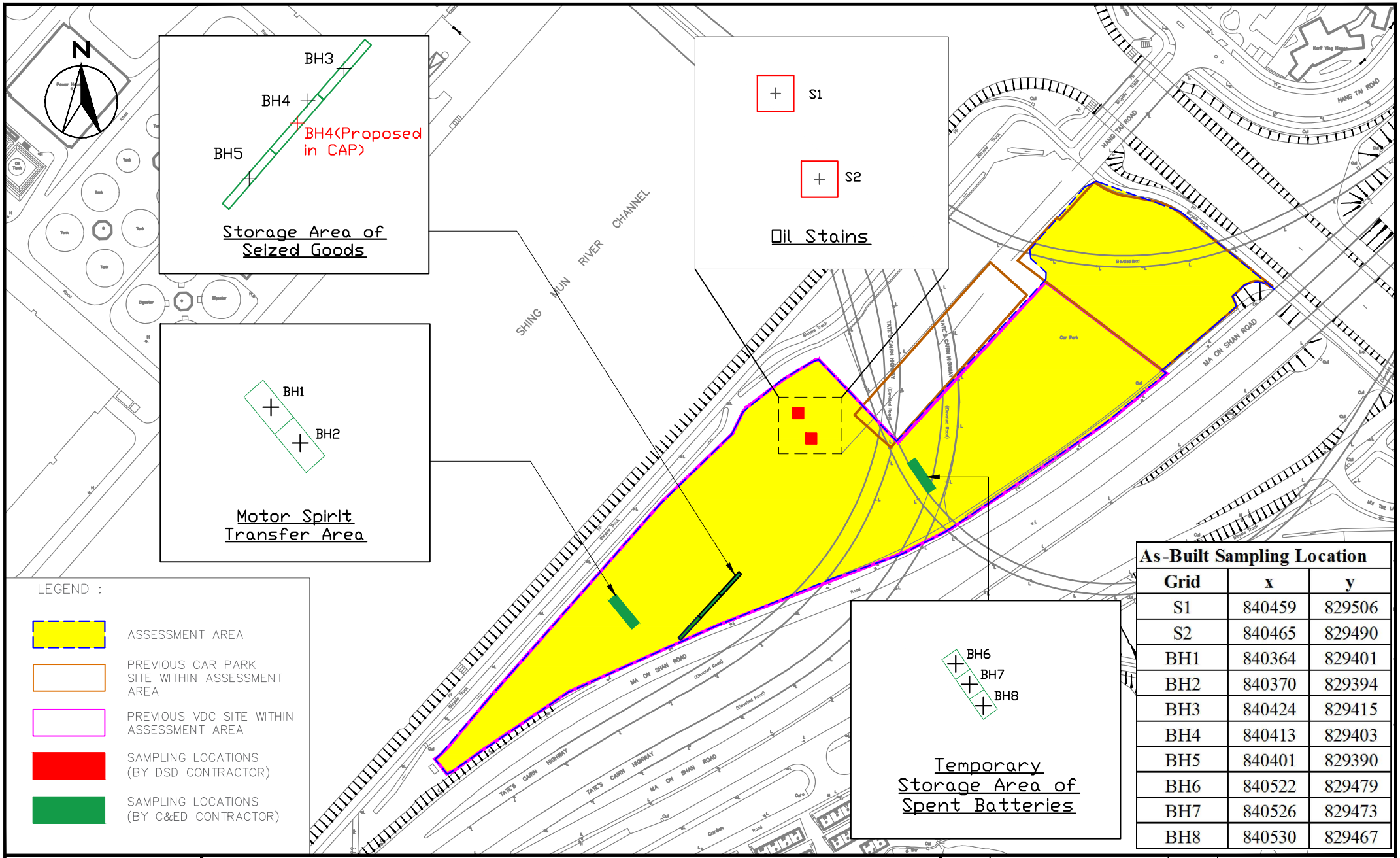

As-Built Sampling Location

Grid	x	y
S1	840459	829506
S2	840465	829490
BH1	840364	829401
BH2	840370	829394
BH3	840424	829415
BH4	840413	829403
BH5	840401	829390
BH6	840522	829479
BH7	840526	829473
BH8	840530	829467

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Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Sampling Locations at VDC

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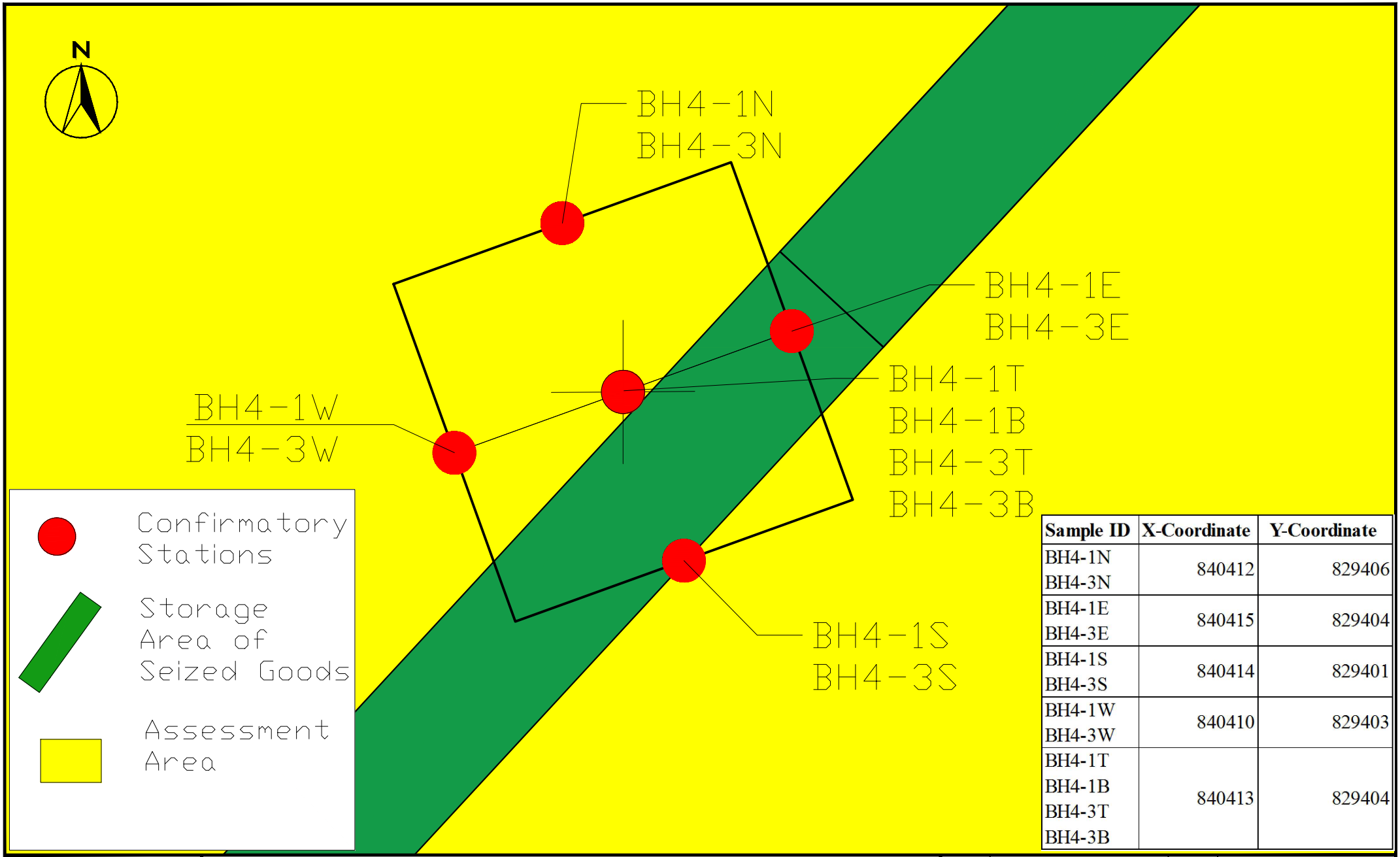
CHECK	IT	DRAWN	BC
JOB No.	IA18064	FIGURE NO. 2	REV 2



Sample ID	X-Coordinate	Y-Coordinate
BH4-1N BH4-3N	840412	829406
BH4-1E BH4-3E	840415	829404
BH4-1S BH4-3S	840414	829401
BH4-1W BH4-3W	840410	829403
BH4-1T BH4-1B BH4-3T BH4-3B	840413	829404

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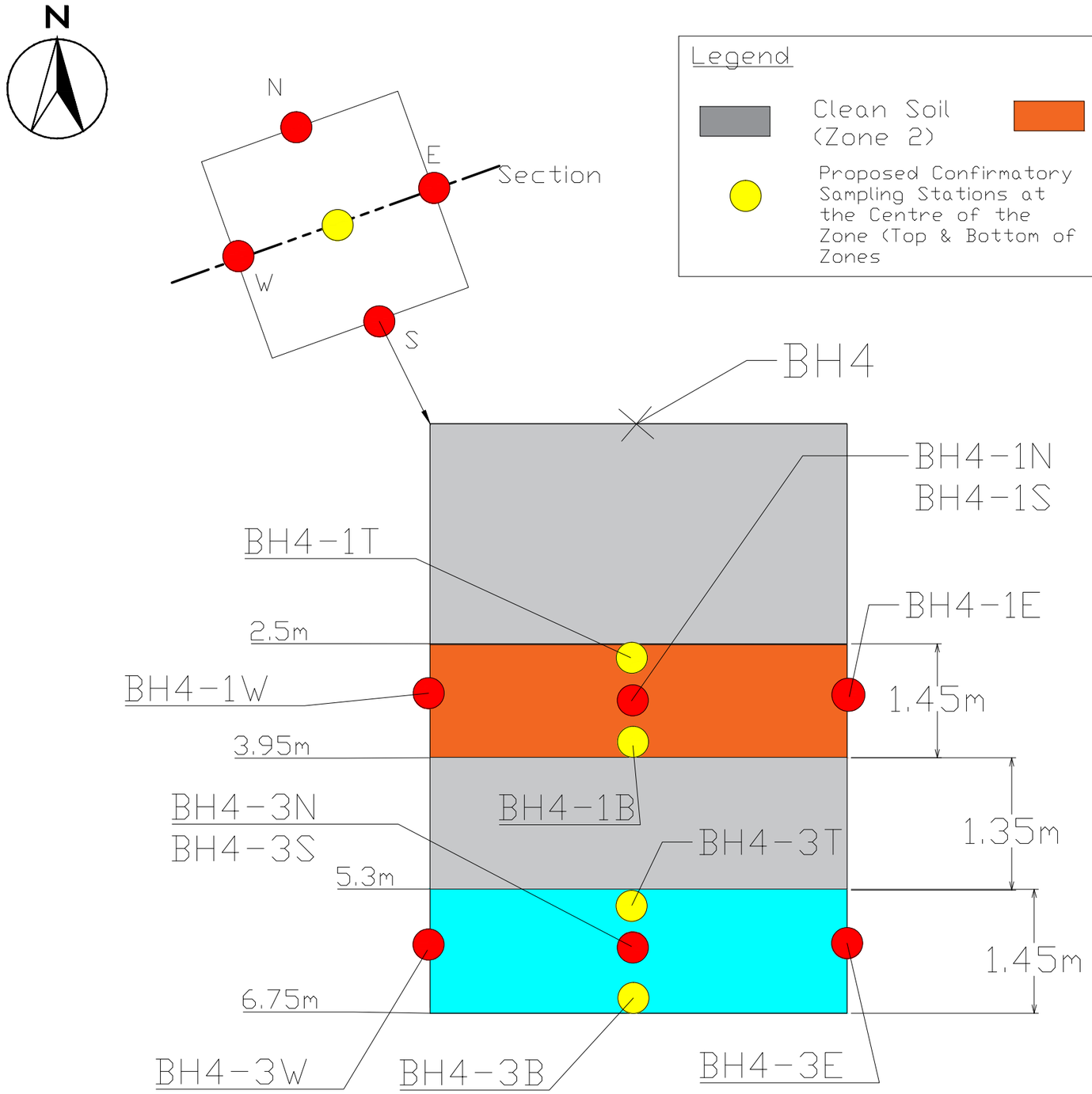
Contract No. SPW 09/2018
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Confirmatory Sampling Locations at BH4 (Top)

SCALE	1:100@A4	DATE	NOV 2019
CHECK	IT	DRAWN	BC
JOB No.	IA18064	FIGURE NO.	5-1a
		REV	2



Sampling Schedule

Zone	Sample ID	Sampling Depth [m bgl]	Testing Parameters
1	BH4-1T	2.5	Tetrachloroethene
1	BH4-1N BH4-1E BH4-1S BH4-1W	3	Tetrachloroethene
1	BH4-1B	3.45	Tetrachloroethene
3	BH4-3T	5.3	Lead
3	BH4-3N BH4-3E BH4-3S BH4-3W	5.8	Lead
3	BH4-3B	6.25	Lead

Contract No. SPW 09/2018
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Confirmatory Sampling Locations at BH4 (Section)

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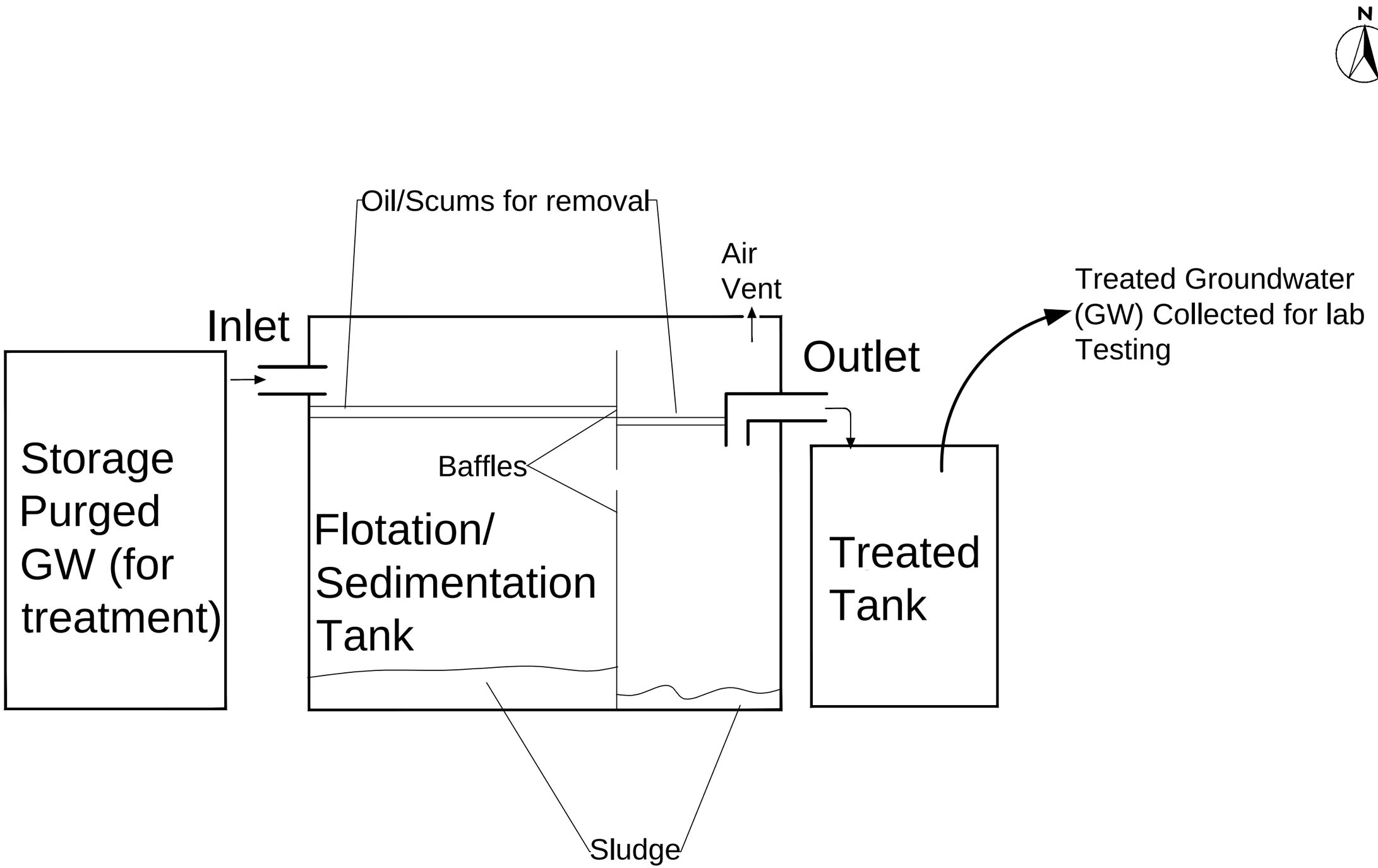
CHECK	IT	DRAWN	BC
JOB No.	IA18064	FIGURE NO. 5-1b	REV 2



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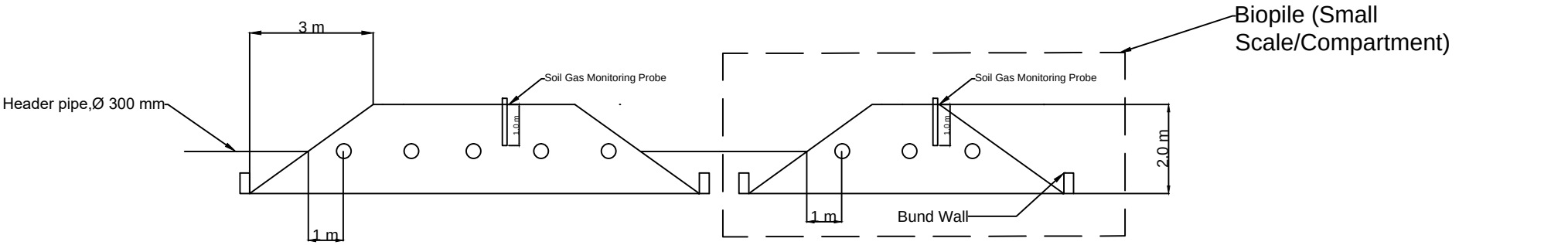
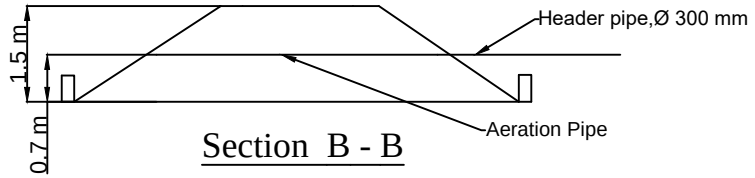
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works
Remediation Action Plan

Schematic diagram of the Set-up for Groundwater Remediation

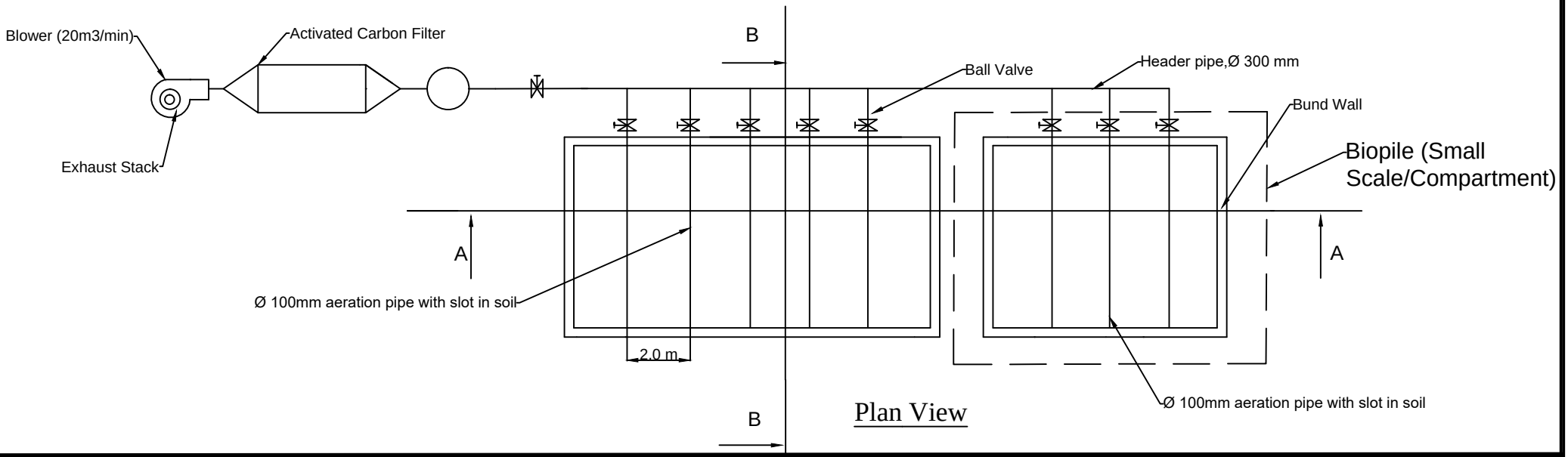
SCALE	NTS	DATE	March 2019
CHECK	CC	DRAWN	KC
PROJECT NO.	IA18064	FIGURE NO.	7–1
		REV	–



Section A - A



Section B - B



Plan View

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Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Schematic Diagram of a Biopile System Set-up

SCALE	NTS	DATE	Feb 2020
CHECK	BC	DRAWN	KC
JOB No.	IA18064	FIGURE NO. 7-2	REV -

N

Sandbags/water absorbent Pads

Bund Wall

~10m

~10m

~20m

L

L

L

SHAN ROAD

ted Road)

Legend

BH4

Stockpile for Contaminated Soil (Zone 1) /Biopile

Stockpile for Clean Soil (Zone 2)

Stockpile for Contaminated Soil (Zone 3)

As-Built Sampling Location

Grid	x	y
BH4	840413	829403

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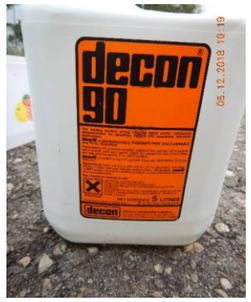
Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Stockpiles Layout and Cross Contamination Prevention

SCALE	1:500	DATE	Mar 2020
CHECK	IT	DRAWN	BC
JOB No.	IA18064	FIGURE NO.	7-3
		REV	2

APPENDIX A
PHOTO RECORD & ON-SITE MEASUREMENT



lab-grade detergent

Cleaning with lab-grade detergent

Rinsing with distilled water

Collecting Equipment Blank for Soil Sampling

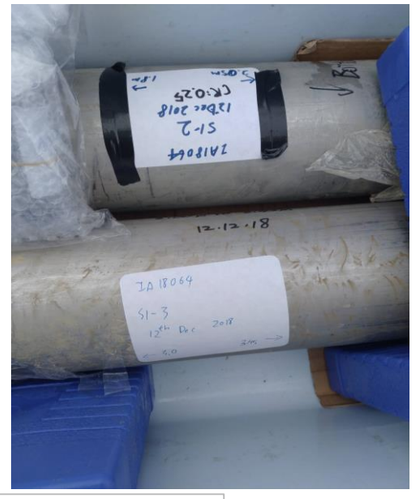
Collecting Equipment Blank

Blanks

Identification of BH Locations

Trial Pit

Borehole Drilling



Soil Samples

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Contract No. SPW 09/2018 Environmental Team Baseline Surveys
for Sha Tin Cavern Sewage Treatment Works

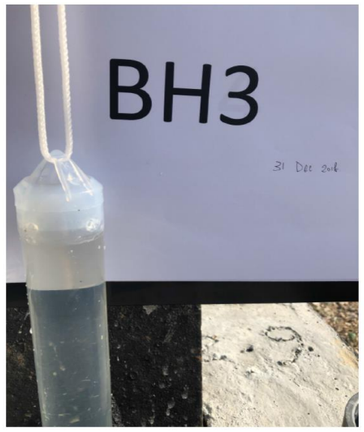
Photo Record for Sampling Works

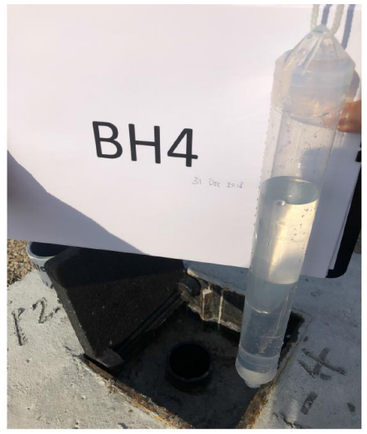
SCALE	N.T.S.	DATE	Mar-19	
CHECK	K.C.	DRAWN	CC	
JOB NO.	IA18064	Appendix A		REV.
				1

Purging

Set-up of Monitoring Well

Installed GW Well





Groundwater Sampling

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Contract No. SPW 09/2018 Environmental Team Baseline Surveys for Sha Tin Cavern Sewage Treatment Works

Photo Record for Sampling Works

SCALE	N.T.S.	DATE	Mar-19
CHECK	K.C.	DRAWN	CC
JOB NO.	IA18064	Appendix A	REV. 1

Measurement of Background VOC Concentration (Below: Close-up view)

Put the Collected Soil Sample into Air-tighted Bag

Put the probe of the VOC Sampler to the Bag for Measurement

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Photo Record for On-site VOC Measurement

SCALE	N.T.S.	DATE	Mar-19
CHECK	K.C.	DRAWN	CC
JOB NO.	IA18064	Appendix A	REV. 1

Appendix A - On-site VOC Measurements Results

Date & Time	Location	Background VOC Concentration	VOC Concentration
S1			
5th Dec 2018 – 10:30	Soil sample from S1-1 (0.5m bgl)	1 ppm	5 ppm
12th Dec 2018 – 9:00	Soil sample from S1-2 (2.2m bgl)	< 1 ppm	10 ppm
12th Dec 2018 – 13:40	Soil sample from S1-3 (3.45m bgl)	< 1 ppm	132 ppm
S2			
5th Dec 2018 – 10:06	Soil sample at S2 - 0.2m bgl	1 ppm	67 ppm
5th Dec 2018 – 10:35	Soil sample from S2-1 (0.5m bgl)	< 1 ppm	17 ppm
8th Dec 2018 – 11:04	Soil sample from S2-2 (1.85m bgl)	< 1 ppm	11 – 150 ppm
11th Dec 2018 – 10:15	Soil sample at S2 – 3.6m bgl	< 1 ppm	< 1 ppm

Remarks: Since the PID meter was unvailable during the sampling works for BH1-8, no measurements were made for the soils in those boreholes.

APPENDIX B
DRILLHOLE RECORD FOR BOREHOLE

DRILLHOLE RECORD

Gammon

HOLE No. **S1**

CONTRACT No. DC/2015/01

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

PROJECT Relocation of Sha Tin Sewage Treatment Works to Caverns - Ground Investigation

METHOD Rotary	CO-ORDINATES	PROJECT No. J3590
MACHINE & No. 200136	E 840454.71 N 829503.94	DATE from 05/12/2018 to 12/12/2018
FLUSHING MEDIUM DRY	ORIENTATION **Vertical**	GROUND LEVEL + 6.23 mPD

Drilling Progress	Casing depth/size	Water Depth (m)	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples (No. Type Depth)	Reduced Level	Depth (m)	Legend	Grade	Description
05/12/2018	SX	08:00								6.23	0.00			
										6.03	0.20			Black (N2.5), BITUMEN layer.
									A 0.45 0.50 INSPECTION PIT B 0.95 1.00					Light brown (7.5YR 6/4), dark grey (N3) and brown (10YR 5/4), slightly silty fine to coarse SAND with much angular to subangular fine to coarse grave sized rock, concrete and bitumen fragments. (FILL)
05/12/2018	SX 1.50	Dry at 18:00							C 1.45 1.50	4.73	1.50			
12/12/2018	PX	Dry at 08:00		50				66 bls	1 1.80 2 2.20 2.25					Brown (10YR 5/4), very silty fine to coarse SAND with much angular to subangular fine to coarse gravel sized rock fragments. (FILL)
				83					T2101	3.98	2.25			Brown (10YR 5/4), COBBLE with much angular to subangular fine to coarse gravel sized rock and concrete fragments in sandy silty matrix. (FILL)
				100				56 bls	3 3.00	3.23	3.00			Brown (10YR 5/4), angular coarse GRAVEL sized rock fragments in sandy silty matrix. (FILL)
				60					4 3.45 3.50 T2101	2.73	3.50			Grey (N6) and brown (10YR 5/4), angular to subangular fine to coarse GRAVEL and COBBLE sized rock and concrete fragments in sandy silty matrix. (FILL)
				50					4.00 T2101					
				71					5.00 T2101					
12/12/2018	PX 6.00	3.62m at 18:00							6.00	0.23	6.00			
														End of hole at 6.00m depth.
										-3.77	10.00			

- Small disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- Piston sample (76mm/100mm)
- Standard penetration test
- Core sent to Laboratory
- Water sample
- Piezometer / Standpipe tip
- Vibrating Wire Piezometer
- Packer (Water Absorption) test
- Acoustic Televiewer Survey Test
- In-situ vane shear test
- Pressuremeter Test
- Point Load Test

LOGGED **W K SIU**

DATE **13/12/2018**

CHECKED **T T FUNG**

DATE **14/12/2018**

REMARKS

1. Inspection pit was dug to 1.50m depth.
2. Monitoring well was installed at 6.00m depth.
3. Jar samples at 1.50m (2 nos.), U100 samples at 1.80-2.000m, U100 samples at 3.00-3.45m and water sample were sent to the laboratory.

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DRILLHOLE RECORD

Gammon

HOLE No. **S2**

CONTRACT No. DC/2015/01

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

PROJECT Relocation of Sha Tin Sewage Treatment Works to Caverns - Ground Investigation

METHOD Rotary	CO-ORDINATES	PROJECT No. J3590
MACHINE & No. 200136	E 840458.43 N 829491.29	DATE from 05/12/2018 to 11/12/2018
FLUSHING MEDIUM DRY	ORIENTATION **Vertical**	GROUND LEVEL + 6.22 mPD

Drilling Progress	Casing depth/size	Water Depth (m)	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples (No. Type Depth)	Reduced Level	Depth (m)	Legend	Grade	Description
05/12/2018	SX	08:00								6.22	0.00			Black (N2.5), BITUMEN layer.
										6.02	0.20			Brown (10YR 5/4) and dark grey (N3), very silty fine to coarse SAND with some angular to subangular fine to coarse gravel and cobble sized rock and bitumen fragments. (FILL)
		Dry at 18:00							A INSPECTION PIT 0.45 0.50	5.72	0.50			
05/12/2018									B 0.95 1.00					
08/12/2018		Dry at 08:00												Brown (10YR 5/4) and dark grey (N3), very silty fine to coarse SAND with some angular to subangular fine to coarse gravel and cobble sized rock, wood and steel fragments. (FILL)
				100				58 bls	1 1.35 1.40					
		Dry at 18:00							2					
08/12/2018	SX								3 1.85 1.90					
10/12/2018	2.00	Dry at 08:00												
	PX													
									4 2.80 2.85	3.37	2.85			
				96					T2101	2.94	3.28			Grey (N6), brown (10YR 5/4) and light grey (N7), COBBLE with some angular to subangular fine to coarse gravel sized rock, concrete and wood fragments. (FILL)
		3.50m at 18:00												
10/12/2018									3.60	2.62	3.60			3.28 - 3.60m: Boulder.
11/12/2018		3.50m at 08:00		28					T2101					
									4.50	1.72	4.50			
				64						1.52	4.70			4.50 - 4.70m: Boulder.
										1.37	4.85			4.70 - 4.85m: Concrete.
									T2101					
	PX 5.90	3.62m at 18:00							5.90	0.32	5.90			
11/12/2018										-3.78	10.00			End of hole at 5.90m depth.

- Small disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- Piston sample (76mm/100mm)
- Standard penetration test
- Core sent to Laboratory
- Water sample
- Piezometer / Standpipe tip
- Vibrating Wire Piezometer
- Packer (Water Absorption) test
- Acoustic Televiewer Survey Test
- In-situ vane shear test
- Pressuremeter Test
- Point Load Test

LOGGED **W K SIU**

DATE **12/12/2018**

CHECKED **T T FUNG**

DATE **13/12/2018**

REMARKS

1. Inspection pit was dug to 1.00m depth.
2. Monitoring well was installed at 5.90m depth.
3. Jar samples at 0.50m (2 nos.), U100 samples at 1.40-1.85m and water sample were sent to the laboratory.

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DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 1**

SHEET 1 of 1

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840363.75** N **829401.46**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD40**		DATE **30.11.2018** to **30.11.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.31** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
30.11.2018	PW								0.00	+6.31	0.00			Dark reddish brown (5YR 3/2) spotted brown, slightly silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
									1 0.45					
									2 0.95 INSPECTION PIT					
									3 1.45					
									4 1.95					
									5 2.05 2.10	+4.21	2.10			
				44					T2-120					Grey (10YR 6/1) mottled light greyish brown, angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments. (FILL)
									6 3.00	+3.31	3.00			
				100				B=29	7 3.45	+2.81	3.50			Greyish brown (2.5Y 5/2) spotted black and dark grey, slightly silty clayey fine to coarse SAND with some angular to subangular fine gravel and with some refuse fragments. (FILL)
									8 3.90					Brown (7.5YR 5/3), slightly clayey silty fine to coarse SAND with some angular to subangular fine to coarse gravel. (FILL)
									9 4.90					
									10 6.00	+0.31	6.00			
				100				B=45	11 6.45					Red (2.5YR 6/8) and greyish brown (2.5Y 5/2) spotted dark grey, slightly silty clayey fine to coarse SAND with some angular to subangular fine gravel and with occasional concrete fragments. (FILL)
30.11.2018	PW 7.00m	4.10 at 1300							12 6.90	-0.69	7.00			End of hole at 7.00 m.

- 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	**S.L. Chiu**
DATE	**05.12.2018**
CHECKED	**R. Chu**
DATE	**07.12.2018**

REMARKS

1. An inspection pit was excavated to 2.10m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 2**

SHEET 1 of 1

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840370.02** N **829393.89**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD7**		DATE **01.12.2018** to **01.12.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.41** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
01.12.2018	PW								0.00	+6.41	0.00			Reddish brown (5YR 5/4) spotted greyish brown, slightly silty fine to coarse SAND with much angular to subangular fine to coarse gravel. (FILL)
									1 0.45 INSPECTION PIT					
									2 0.95					
									3 1.15	+5.26	1.15			Grey (10YR 6/1) mottled brown, angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments and with occasional concrete fragments. (FILL)
				82					T2-120					
									4 2.00	+4.41	2.00			Greyish brown (10YR 5/2) spotted grey, slightly silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel and with some concrete fragments. (FILL)
									5 2.40					
								B=42	6 3.00	+3.41	3.00			Brown (7.5YR 4/2), slightly silty fine to coarse SAND with some angular to subangular fine gravel and with occasional concrete fragments. (FILL)
				100					7 3.45	+2.91	3.50			Brown (10YR 4/3) mottled grey and light reddish brown, slightly clayey silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
									8 3.90					
									9 4.90					
									10 6.00	+0.41	6.00			Brown (10YR 4/3), slightly clayey silty fine to coarse SAND with some to much angular to subangular fine gravel. (FILL)
				100				B=33	11 6.45					
01.12.2018	PW 7.00m	2.80 at 1300							12 6.90	-0.59	7.00			End of hole at 7.00 m.

SMALL DISTURBED SAMPLE
LARGE DISTURBED SAMPLE
U76 SAMPLE
PISTON SAMPLE (78mm)
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 **S.L. Chiu**
DATE **05.12.2018**
CHECKED **R. Chu**
DATE **07.12.2018**

REMARKS
1. An inspection pit was excavated to 1.15m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRILTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 3**

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

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840423.98** N **829415.32**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD07**		DATE **24.11.2018** to **26.11.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.12** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
24.11.2018	SW								0.00	+6.12	0.00			Brown (7.5YR 4/3) and greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
									1 0.45	+5.62	0.50			Brown (7.5YR 4/3), slightly silty clayey fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
1									2 0.95					
									INSPECTION PIT					
									3 1.45	+4.62	1.50			Brown (7.5YR 4/3) and greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
2									4 1.95					
									5 2.45					
24.11.2018	SW 3.00m	Dry at 1800												
26.11.2018	PW	Dry at 0900		64				B=41	6 3.00	+3.12	3.00			Dark greyish brown (10YR 4/2), angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments and with occasional wood fragments. (FILL)
									7 3.45	+2.62	3.50			Brown (7.5YR 5/4) spotted grey, slightly silty fine to coarse SAND with much angular to subangular fine to medium gravel. (FILL)
4									8 3.90	+2.12	4.00			Greyish brown (2.5Y 5/2), slightly clayey silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel and with occasional refuse fragments. (FILL)
5									9 4.90					
6	PW 6.00m													
	HW			100				B=98	10 6.00	+0.12	6.00			Greyish brown (2.5Y 5/2), slightly clayey silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel and with occasional plastic and refuse fragments. (FILL)
26.11.2018	HW 7.00m	3.70 at 1800							11 6.45					
									12 6.90	-0.88	7.00			End of hole at 7.00 m.
8														
9														
10														

- 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	**S.L. Chiu**
DATE	**28.11.2018**
CHECKED	**R. Chu**
DATE	**04.12.2018**

REMARKS

1. An inspection pit was excavated to 2.50m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRILLHOLE RECORD

DRiLTECH

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 4**

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

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840412.68** N **829403.45**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD40**		DATE **28.11.2018** to **28.11.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.12** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
28.11.2018	PW								0.00	+6.12	0.00			Greyish brown (2.5Y 5/2) and grey (2.5Y 5/1), slightly clayey silty fine to coarse SAND with occasional to some angular to subangular fine gravel. (FILL)
									1 0.45					
									2 0.95					
									3 INSPECTION PIT 1.45					
									4 1.95					
									5 2.45					
				100				B=24	6 3.00	+3.12	3.00			Light olive brown (2.5Y 5/3), silty sandy CLAY with some angular to subangular fine gravel. (FILL)
									7 3.45	+2.62	3.50			Brown (7.5YR 4/2) and greyish brown (10YR 5/2), slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel. (FILL)
									8 3.90	+2.12	4.00			Grey (2.5Y 5/1), angular to subangular, very sandy fine to coarse GRAVEL of concrete fragments. (FILL)
									9 4.90					
										+0.32	5.80			Brown (7.5YR 4/2) and greyish brown (10YR 5/2), slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel. (FILL)
				100				B=54	10 5.80					
									11 6.25	-0.18	6.30			Brown (7.5YR 4/2) and greyish brown (10YR 5/2), slightly clayey silty fine to coarse SAND with some angular to subangular fine to coarse gravel. (FILL)
28.11.2018	PW 7.00m	2.00 at 1300							12 6.90	-0.88	7.00			End of hole at 7.00 m.

- 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 **S.L. Chiu**

DATE **05.12.2018**

CHECKED **R. Chu**

DATE **06.12.2018**

REMARKS

1. An inspection pit was excavated to 2.50m deep by hand tools.
2. A standpipe was installed to 6.60m.

DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 5**

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

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD **ROTARY**	CO-ORDINATES E **840400.80** N **829389.68**	TASK ORDER NO. **GE/2017/12.9**
MACHINE **SD40**		DATE **26.11.2018** to **27.11.2018**
FLUSHING MEDIUM **DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.02** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.11.2018	PW								0.00	+6.02	0.00			Greyish brown (2.5Y 5/2) spotted dark grey, angular to subangular, slightly silty very sandy fine to coarse GRAVEL of rock fragments and with some refuse fragments. (FILL)
									1 0.45	+5.52	0.50			Brown (7.5YR 5/3) spotted grey, slightly clayey silty fine to coarse SAND with much angular to subangular fine to coarse gravel. (FILL)
									2 0.95 (INSPECTION PIT)					
									3 1.45					
									4 1.95					
									5 2.35					
				100				B=47	6 3.00					
									7 3.45	+2.52	3.50			Brown (7.5YR 5/3) spotted grey, slightly clayey silty fine to coarse SAND with much angular to subangular fine to coarse gravel and with some concrete fragments. (FILL)
									8 3.90	+2.02	4.00			Brown (7.5YR 4/2), slightly clayey silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
									9 4.90					
				100				B=57	10 6.00					
26.11.2018		2.00 at 1800							11 6.45	-0.48	6.50			
27.11.2018		3.00 at 0900												Grey (7.5YR 6/1), angular to subangular, coarse GRAVEL of rock fragments. (FILL)
27.11.2018	PW 7.00m	3.00 at 1200						△	12 6.90	-0.98	7.00			
														End of hole at 7.00 m.

- 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 **S.L. Chiu**

DATE **28.11.2018**

CHECKED **R. Chu**

DATE **04.12.2018**

REMARKS

1. An inspection pit was excavated to 2.40m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 6**

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

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840522.08** N **829478.91**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD40**		DATE **05.12.2018** to **05.12.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.40** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
05.12.2018	PW								0.00	+6.40	0.00			Brown (7.5YR 4/3), slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel. (FILL)
									1 0.45					
									2 0.95 INSPECTION PIT					
									3 1.45					
									4 1.95					
									5 2.05 2.10	+4.30	2.10			
				75					T2-120					Grey (7.5YR 6/1), angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments and with some concrete fragments. (FILL)
									6 2.50	+3.90	2.50			
								B=77	7 3.00					Brown (7.5YR 5/3) and greyish brown (10YR 4/2), slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel. (FILL)
				100					8 3.45	+2.90	3.50			
									9 3.90					Very dark greyish brown (10YR 3/2) and brown (10YR 4/3), slightly silty clayey fine to coarse SAND with some angular to subangular fine gravel. (FILL)
									10 4.90					
									11 6.00					
				100				B=67	12 6.45					
05.12.2018	PW 7.00m	3.10 at 1300							13 6.90	-0.60	7.00			End of hole at 7.00 m.

- 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 **S.L. Chiu**

DATE **06.12.2018**

CHECKED **R. Chu**

DATE **07.12.2018**

REMARKS

1. An inspection pit was excavated to 2.10m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 7**

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

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840525.80** N **829473.08**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD7**		DATE **03.12.2018** to **04.12.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.47** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
03.12.2018	PW								0.00	+6.47	0.00			Grey (7.5YR 5/1), angular to subangular, sandy fine to coarse GRAVEL of rock fragments. (FILL)
									1 0.45 INSPECTION PIT					
1									2 0.95	+5.47	1.00			
									3 1.45 1.50	+4.97	1.50			Brown (7.5YR 4/4) spotted grey, fine to coarse SAND with much angular to subangular fine to medium gravel and with some concrete fragments. (FILL)
				69					T2-120					Light grey (7.5YR 7/1) mottled grey and brown, angular to subangular, coarse GRAVEL and COBBLE of rock fragments and with occasional concrete fragments. (FILL)
2									2.30	+4.17	2.30			
									4 2.40					Greyish brown (10YR 5/2), slightly clayey silty fine to coarse SAND with some angular to subangular fine to coarse gravel. (FILL)
		0.70 at 1800												
03.12.2018									5 3.00					
04.12.2018		0.45 at 0800		100				B=51						
									6 3.45	+2.97	3.50			
4									7 3.90					Grey (2.5Y 6/1), slightly clayey silty fine to coarse SAND with much angular to subangular fine to coarse gravel and with some concrete fragments. (FILL)
									8 4.90					
5														
									9 6.00	+0.47	6.00			
6				71				B=18						Greyish brown (2.5Y 5/2) spotted black, slightly silty clayey fine to coarse SAND with much angular to subangular fine to coarse gravel. (FILL)
									10 6.45					
04.12.2018	PW 7.00m	2.55 at 1200							11 6.90	-0.53	7.00			
														End of hole at 7.00 m.
8														
9														
10														

- 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	**S.L. Chiu**
DATE	**05.12.2018**
CHECKED	**R. Chu**
DATE	**07.12.2018**

REMARKS

1. An inspection pit was excavated to 1.50m deep by hand tools.
2. A standpipe was installed to 7.00m.

DRiLTECH

DRILLHOLE RECORD

CONTRACT NO. **GE/2017/12**

HOLE NO. **BH 8**

SHEET 1 of 1

PROJECT **Site Investigation for Former C&ED Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin**

METHOD	**ROTARY**	CO-ORDINATES E **840529.98** N **829467.26**	TASK ORDER NO. **GE/2017/12.9**
MACHINE	**SD40**		DATE **04.12.2018** to **04.12.2018**
FLUSHING MEDIUM	**DRY DRILLING**	ORIENTATION **VERTICAL**	GROUND LEVEL **+6.38** mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/ End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
04.12.2018									0.00	+6.38	0.00			Dark greyish brown (2.5Y 4/2) and brown (7.5YR 5/4), slightly silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel. (FILL)
									1 0.45 INSPECTION PIT					
									2 0.95					
									3 1.10	+5.28	1.10			Grey (10YR 6/1) mottled dark brown, angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments. (FILL)
				36					T2-120					
									2.00	+4.38	2.00			Reddish brown (5YR 5/4), slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel. (FILL)
									4 2.40	+3.88	2.50			
				100					T2-120 2.50	+3.73	2.65			Dark brown (7.5YR 3/2), COBBLE and occasional coarse gravel of rock fragments and with occasional wood fragments. (FILL)
									2.65					Grey (10YR 5/1), angular to subangular, sandy fine to coarse GRAVEL of rock fragments. (FILL)
				100				B=129	5 3.00					
									6 3.45					
									7 3.90	+2.28	4.10			
				100					T2-120 4.10	+2.08	4.30			Grey (10YR 6/1), angular to subangular, slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments and with occasional concrete fragments. (FILL)
									4.30					Grey (10YR 5/1), angular to subangular, sandy fine to coarse GRAVEL of rock fragments. (FILL)
									8 4.90					
									9 6.00	+0.38	6.00			Brown (7.5YR 5/4) mottled reddish brown and grey, slightly clayey silty fine to coarse SAND with some angular to subangular fine gravel and with occasional refuse fragments. (FILL)
				100				B=27	10 6.45					
04.12.2018		2.38 at 1800							11 6.90	-0.62	7.00			End of hole at 7.00 m.

- 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	**S.L. Chiu**
DATE	**05.12.2018**
CHECKED	**R. Chu**
DATE	**06.12.2018**

REMARKS

1. An inspection pit was excavated to 1.10m deep by hand tools.
2. A standpipe was installed to 7.00m.

APPENDIX C
LIST OF SOIL AND GROUNDWATER SAMPLE

Borehole		S1	S2	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8
As-built Coordinate											
Easting (m)		840454.71	840458.43	840363.75	840370.02	840423.98	840412.69	840400.80	840522.08	840525.80	840529.98
Northing (m)		829503.94	829491.29	829401.46	829393.89	829415.32	829403.45	829389.68	829478.91	829473.08	829467.26
Date and Depth of the Samples											
Soil Sample 1	**Sample ID**	**S1-1**	**S2-1**	**BH1-0.5m**	**BH2-0.5m**	**BH3-0.5m**	**BH4-0.5m**	**BH5-0.5m**	**BH6-0.5m[1]**	**BH7-0.5m**	**BH8-0.5m[1]**
	Depth (m bgl)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Date	05-Dec-18	05-Dec-18	21-Nov-18	21-Nov-18	21-Nov-18	21-Nov-18	21-Nov-18	21-Nov-18	21-Nov-18	21-Nov-18
Soil Sample 2	**Sample ID**	**S1-2 [1]**	**S2-2**	**BH1-3.0-3.45m**	**BH2-3.0-3.45m**	**BH3-3.0-3.45m**	**BH4-3.0-3.45m**	**BH5-3.0-3.45m**	**BH6-3.0-3.45m**	**BH7-3.0-3.45m**	**BH8-3.0-3.45m**
	Depth (m bgl)	1.8 -2.2	1.40-1.85	3.0-3.45	3.0-3.45	3.0-3.45	3.0-3.45	3.0-3.45	3.0-3.45	3.0-3.45	3.0-3.45
	Date	12-Dec-18	08-Dec-18	30-Nov-18	01-Dec-18	26-Nov-18	28-Nov-18	26-Nov-18	05-Dec-18	04-Dec-18	04-Dec-18
Soil Sample 3	**Sample ID**	**S1-3**	**N/A**	**BH1-6.0-6.45m**	**BH2-6.0-6.45m**	**BH3-6.0-6.45m**	**BH4-5.8-6.25m**	**BH5-6.0-6.45m**	**BH6-6.0-6.45m**	**BH7-6.0-6.45m**	**BH8-6.0-6.45m**
	Depth (m bgl)	3.0-3.45	**N/A**	6.0-6.45	6.0-6.45	6.0-6.45	5.8-6.25	6.0-6.45	6.0-6.45	6.0-6.45	6.0-6.45
	Date	12-Dec-18	**N/A**	30-Nov-18	01-Dec-18	26-Nov-18	28-Nov-18	26-Nov-18	05-Dec-18	04-Dec-18	04-Dec-18
Groundwater Sample	**Sample ID**	**S1-W**	**S2-W [2]**	**BH1-G.W.**	**BH2-G.W.**	**BH3-G.W.**	**BH4-G.W.**	**BH5-G.W.**	**BH6-G.W.**	**BH7-G.W.**	**BH8-G.W.**
	Date	14-Dec-18	14-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18	11-Dec-18
Other Information											
Final Borehole Depth (m bgl)		6.0	5.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Static Groundwater Level (m bgl)		3.6	3.5	3.66	3.55	3.2	2.97	2.75	2.53	2.74	2.8
Initial Groundwater Levels (m bgl)		3.1	3.1	3.5	3.4	3.04	2.82	2.61	2.35	2.59	2.64

Note:

[1] Duplicate Soil Samples have been taken for S1-2, BH6-0.5m & BH8-0.5m.

[2] Duplicate Groundwater Samples have been taken for S2-W.

APPENDIX D
SUMMARY OF LABORATORY RESULT

Soil Sampling Analytical Results Summary table

Chemical	Frequency of Detection (x/y)	Range of Detected Concentration (mg/kg)	Range of Method Reporting Limit (mg/kg)	Analytical Method	Relevant Land Use Categories	Most Stringent RBRG (mg/kg)	Csat (mg/kg)	Maximum Detected Concentration Exceeds (check if applicable)	
								RBRG	Csat
Metal									
Antimony	4/32	BDL - 2	1	USEPA 6020	Most Stringent	2.91E+01	-	NO	-
Arsenic	32/32	2 - 16	1	USEPA 6020	Most Stringent	2.18E+01	-	NO	-
Barium	32/32	18.5 - 91.7	1	USEPA 6020	Most Stringent	1.00E+04	-	NO	-
Cadmium	9/32	BDL - 0.6	0.2	USEPA 6020	Most Stringent	7.28E+01	-	NO	-
Chromium (III)	32/32	3.8 - 18	1	USEPA 6020	Most Stringent	1.00E+04	-	NO	-
Chromium (VI)	1/32	BDL - 1.2	1	USEPA Method 3060 APHA Method	Most Stringent	2.18E+02	-	NO	-
Cobalt	32/32	1.5 - 5.5	1	USEPA 6020	Most Stringent	1.46E+03	-	NO	-
Copper	32/32	3 - 181	1	USEPA 6020	Most Stringent	2.91E+03	-	NO	-
Lead	32/32	28 - 1420	1	USEPA 6020	Most Stringent	2.55E+02	-	**YES**	-
Manganese	32/32	191 - 3540	1	USEPA 6020	Most Stringent	1.00E+04	-	NO	-
Mercury	13/32	BDL - 0.08	0.05	USEPA 3112B	Most Stringent	6.52E+00	-	NO	-
Molybdenum	32/32	1 - 11	1	USEPA 6020	Most Stringent	3.64E+02	-	NO	-
Nickel	32/32	2 - 17	1	USEPA 6020	Most Stringent	1.46E+03	-	NO	-
Tin	32/32	2.2 - 11.5	1	USEPA 6020	Most Stringent	1.00E+04	-	NO	-
Zinc	32/32	34 - BDL	1	USEPA 6020	Most Stringent	1.00E+04	-	NO	-
VOCs									
2-Propanone (Acetone)	0/21	BDL	50	USEPA 8260	Most Stringent	4.26E+03	***	-	-
Benzene	0/21	BDL	0.2	USEPA 8260	Most Stringent	2.79E-01	3.36E+02	NO	NO
Bromodichloromethane	0/21	BDL	0.1	USEPA 8260	Most Stringent	1.29E-01	1.03E+03	NO	NO
2-Butanone (MEK)	0/21	BDL	5	USEPA 8260	Most Stringent	1.00E+04	***	NO	-
Chloroform	0/21	BDL	0.04	USEPA 8260	Most Stringent	5.29E-02	1.10E+03	NO	NO
Ethylbenzene	0/21	BDL	0.5	USEPA 8260	Most Stringent	2.98E+02	1.38E+02	NO	NO
Methyl tert-Butyl Ether	0/21	BDL	0.5	USEPA 8260	Most Stringent	2.80E+00	2.38E+03	NO	NO
Methylene Chloride	0/21	BDL	0.5	USEPA 8260	Most Stringent	5.29E-01	9.21E+02	NO	NO
Styrene	0/21	BDL	0.5	USEPA 8260	Most Stringent	1.54E+03	4.97E+02	NO	NO
Tetrachloroethene	1/21	BDL - BDL	0.04	USEPA 8260	Most Stringent	4.44E-02	9.71E+01	**YES**	NO
Toluene	0/21	BDL	0.5	USEPA 8260	Most Stringent	7.05E+02	2.35E+02	NO	NO
Trichloroethene	0/21	BDL	0.1	USEPA 8260	Most Stringent	2.11E-01	4.88E+02	NO	NO
Xylenes (Total)	0/21	BDL	2	USEPA 8260	Most Stringent	3.68E+01	1.50E+02	NO	NO
SVOCs									
Acenaphthene	0/21	BDL	0.5	USEPA 8270	Most Stringent	3.28E+03	6.02E+01	NO	NO
Acenaphthylene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.51E+03	1.98E+01	NO	NO
Anthracene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.00E+04	2.56E+00	NO	NO
Benzo(a)anthracene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.14E+01	-	NO	-
Benzo(a)pyrene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.14E+00	-	NO	-
Benzo(b)fluoranthene	0/21	BDL	0.5	USEPA 8270	Most Stringent	9.88E+00	-	NO	-
Benzo(g,h,i)perylene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.71E+03	-	NO	-
Benzo(k)fluoranthene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.14E+02	-	NO	-
bis(2-ethylhexyl)phthalate	0/15	BDL	0.5	USEPA 8270	Most Stringent	2.80E+01	-	NO	-
Chrysene	0/21	BDL	0.5	USEPA 8270	Most Stringent	8.71E+02	-	NO	-
Dibenz(a,h)anthracene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.14E+00	-	NO	-
Fluoranthene	0/21	BDL	0.5	USEPA 8270	Most Stringent	2.27E+03	-	NO	-
Fluorene	0/21	BDL	0.5	USEPA 8270	Most Stringent	2.20E-01	5.47E+01	NO	NO
Hexachlorobenzene	0/15	BDL	0.2	USEPA 8270	Most Stringent	2.25E+03	-	NO	-
Indeno(1.2.3.cd)pyrene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.14E+01	-	NO	-
Naphthalene	0/21	BDL	0.5	USEPA 8270	Most Stringent	8.56E+01	1.25E+02	NO	NO
Phenanthrene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.00E+04	2.80E+01	NO	NO
Phenol	0/15	BDL	0.5	USEPA 8270	Most Stringent	1.00E+04	7.26E+03	NO	-
Pyrene	0/21	BDL	0.5	USEPA 8270	Most Stringent	1.71E+03	-	NO	-
Petroleum Carbon Ranges									
C6 - C8 Fraction	0/21	BDL	5	USEPA 8260/8015	Most Stringent	5.45E+02	1000	NO	-
C9 - C16 Fraction	0/21	BDL	200	USEPA 8260/8015	Most Stringent	1.33E+03	3000	NO	-
C17 - C35 Fraction	1/21	BDL - BDL	500	USEPA 8260/8015	Most Stringent	1.00E+04	5000	NO	-

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

* indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Detailed Soil Sampling Analytical Results

Parameters	> Criteria	RBRGs Adoped in the CAP (mg/kg)	Soil Saturation Limit (Csat) (mg/kg)	Reporting Limit (mg/kg)	Maximum Value		S1-1	S1-2	S1-2 (Duplicate)	S1-3	S2-1	S2-2 (1.4m - 1.85m)	BH1-0.5m	BH1-3.0-3.45m	BH1-6.0-6.45m
Metal															
Antimony	No	2.91E+01	-	1.00E+00	2.00E+00		BDL	BDL	BDL	BDL	BDL	BDL	1.00E+00	2.00E+00	BDL
Arsenic	No	2.18E+01	-	1.00E+00	1.60E+01		5.00E+00	4.00E+00	3.00E+00	2.00E+00	8.00E+00	4.00E+00	4.00E+00	1.60E+01	4.00E+00
Barium	No	1.00E+04	-	1.00E+00	9.17E+01		4.83E+01	5.36E+01	5.58E+01	2.18E+01	5.45E+01	3.23E+01	5.11E+01	7.96E+01	4.56E+01
Cadmium	No	7.28E+01	-	2.00E-01	6.00E-01		BDL	2.00E-01	6.00E-01	BDL	BDL	4.00E-01	4.00E-01	BDL	BDL
Chromium (III)	No	1.00E+04	-	1.00E+00	1.80E+01		7.10E+00	9.50E+00	4.90E+00	4.30E+00	1.80E+01	1.10E+01	1.59E+01	1.55E+01	9.30E+00
Chromium (VI)	No	2.18E+02	-	1.00E+00	1.20E+00		BDL	BDL	BDL	BDL	BDL	BDL	1.20E+00	BDL	BDL
Cobalt	No	1.46E+03	-	1.00E+00	5.50E+00		2.40E+00	2.90E+00	2.60E+00	2.00E+00	3.00E+00	2.60E+00	2.20E+00	5.50E+00	1.80E+00
Copper	No	2.91E+03	-	1.00E+00	1.81E+02		1.40E+01	1.70E+01	1.00E+01	7.00E+00	1.70E+01	1.30E+01	2.20E+01	1.81E+02	1.10E+01
Lead	**Yes**	2.55E+02	-	1.00E+00	**1.42E+03**		6.50E+01	5.00E+01	4.10E+01	8.30E+01	4.90E+01	6.40E+01	7.40E+01	6.90E+01	6.30E+01
Manganese	No	1.00E+04	-	1.00E+00	3.54E+03		2.91E+02	5.50E+02	4.87E+02	1.18E+03	2.74E+02	2.44E+02	4.35E+02	4.92E+02	2.79E+02
Mercury	No	6.52E+00	-	5.00E-02	8.00E-02		8.00E-02	BDL	BDL	8.00E-02	8.00E-02	7.00E-02	BDL	6.00E-02	BDL
Molybdenum	No	3.64E+02	-	1.00E+00	1.10E+01		3.00E+00	3.00E+00	2.00E+00	8.00E+00	8.00E+00	3.00E+00	3.00E+00	9.00E+00	6.00E+00
Nickel	No	1.46E+03	-	1.00E+00	1.70E+01		4.00E+00	4.00E+00	3.00E+00	2.00E+00	5.00E+00	5.00E+00	3.00E+00	6.00E+00	4.00E+00
Tin	No	1.00E+04	-	1.00E+00	1.15E+01		6.00E+00	3.90E+00	3.20E+00	6.00E+00	4.90E+00	4.80E+00	6.20E+00	1.10E+01	5.20E+00
Zinc	No	1.00E+04	-	1.00E+00	2.36E+02		1.01E+02	7.20E+01	6.50E+01	6.40E+01	1.49E+02	6.80E+01	1.03E+02	2.36E+02	7.30E+01
VOCs															
2-Propanone (Acetone)	No	4.26E+03	***	5.00E+01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	No	2.79E-01	3.36E+02	2.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	No	1.29E-01	1.03E+03	1.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	No	1.00E+04	***	5.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	No	5.29E-02	1.10E+03	4.00E-02	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	No	2.98E+02	1.38E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl tert-Butyl Ether	No	2.80E+00	2.38E+03	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	No	5.29E-01	9.21E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	No	1.54E+03	4.97E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	**Yes**	4.44E-02	9.71E+01	4.00E-02	**9.00E-02**		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	No	7.05E+02	2.35E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	No	2.11E-01	4.88E+02	1.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes (Total)	No	3.68E+01	1.50E+02	2.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SVOCs															
Acenaphthene	No	3.28E+03	6.02E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acenaphthylene	No	1.51E+03	1.98E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Anthracene	No	1.00E+04	2.56E+00	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benz(a)anthracene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	No	9.88E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(g,h,i)perylene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	No	1.14E+02	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	No	2.80E+01	-	5.00E-01	BDL		----	----	----	----	----	----	BDL	BDL	BDL
Chrysene	No	8.71E+02	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenz(a,h)anthracene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoranthene	No	2.27E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluorene	No	2.25E+03	5.47E+01	2.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexachlorobenzene	No	2.20E-01	-	5.00E-01	BDL		----	----	----	----	----	----	BDL	BDL	BDL
Indeno(1.2.3.cd)pyrene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	No	8.56E+01	1.25E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Phenanthrene	No	1.00E+04	2.80E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Phenol	No	1.00E+04	7.26E+03	5.00E-01	BDL		----	----	----	----	----	----	BDL	BDL	BDL
Pyrene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PCRs															
C6 - C8 Fraction	No	5.45E+02	1.00E+03	5.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C9 - C16 Fraction	No	1.33E+03	3.00E+03	2.00E+02	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C17 - C35 Fraction	No	1.00E+04	5.00E+03	5.00E+02	1.12E+03		BDL	BDL	BDL	BDL	1.12E+03	BDL	BDL	BDL	BDL

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

---- : The parameters were not tested for the samples collected

* indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Detailed Soil Sampling Analytical Results

Parameters	> Criteria	RBRGs Adoped in the CAP (mg/kg)	Soil Saturation Limit (Csat) (mg/kg)	Reporting Limit (mg/kg)	Maximum Value		BH2-0.5m	BH2-3.0-3.45m	BH2-6.0-6.45m	BH3-0.5m	BH3-3.0-3.45m	BH3-6.0-6.45m	BH4-0.5m	BH4-3.0-3.45m	BH4-5.8-6.25m
Metal															
Antimony	No	2.91E+01	-	1.00E+00	2.00E+00		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	No	2.18E+01	-	1.00E+00	1.60E+01		5.00E+00	3.00E+00	4.00E+00	4.00E+00	4.00E+00	4.00E+00	3.00E+00	4.00E+00	7.00E+00
Barium	No	1.00E+04	-	1.00E+00	9.17E+01		4.64E+01	9.17E+01	4.58E+01	2.74E+01	3.66E+01	3.02E+01	1.97E+01	2.26E+01	8.77E+01
Cadmium	No	7.28E+01	-	2.00E-01	6.00E-01		BDL	BDL	3.00E-01	BDL	BDL	BDL	BDL	BDL	6.00E-01
Chromium (III)	No	1.00E+04	-	1.00E+00	1.80E+01		1.17E+01	4.20E+00	8.00E+00	4.30E+00	7.50E+00	9.60E+00	3.80E+00	8.10E+00	6.70E+00
Chromium (VI)	No	2.18E+02	-	1.00E+00	1.20E+00		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cobalt	No	1.46E+03	-	1.00E+00	5.50E+00		3.20E+00	3.10E+00	2.80E+00	1.60E+00	2.30E+00	1.50E+00	1.50E+00	3.90E+00	4.80E+00
Copper	No	2.91E+03	-	1.00E+00	1.81E+02		1.40E+01	4.00E+00	1.80E+01	8.00E+00	1.50E+01	9.00E+00	7.00E+00	6.00E+00	1.20E+01
Lead	**Yes**	2.55E+02	-	1.00E+00	**1.42E+03**		5.30E+01	3.40E+01	1.68E+02	3.60E+01	4.60E+01	3.30E+01	3.50E+01	9.00E+01	1.42E+03
Manganese	No	1.00E+04	-	1.00E+00	3.54E+03		4.91E+02	3.52E+02	5.56E+02	3.71E+02	4.44E+02	1.97E+02	2.39E+02	6.85E+02	3.54E+03
Mercury	No	6.52E+00	-	5.00E-02	8.00E-02		BDL	BDL	5.00E-02	BDL	7.00E-02	5.00E-02	BDL	BDL	BDL
Molybdenum	No	3.64E+02	-	1.00E+00	1.10E+01		4.00E+00	2.00E+00	3.00E+00	2.00E+00	3.00E+00	1.00E+00	3.00E+00	2.00E+00	3.00E+00
Nickel	No	1.46E+03	-	1.00E+00	1.70E+01		5.00E+00	2.00E+00	4.00E+00	2.00E+00	4.00E+00	4.00E+00	2.00E+00	4.00E+00	3.00E+00
Tin	No	1.00E+04	-	1.00E+00	1.15E+01		5.40E+00	2.60E+00	4.40E+00	5.50E+00	5.10E+00	3.10E+00	5.30E+00	1.15E+01	2.40E+00
Zinc	No	1.00E+04	-	1.00E+00	2.36E+02		8.90E+01	4.60E+01	9.00E+01	7.40E+01	6.90E+01	6.20E+01	6.40E+01	8.70E+01	1.65E+02
VOCs															
2-Propanone (Acetone)	No	4.26E+03	***	5.00E+01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	No	2.79E-01	3.36E+02	2.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	No	1.29E-01	1.03E+03	1.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	No	1.00E+04	***	5.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	No	5.29E-02	1.10E+03	4.00E-02	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	No	2.98E+02	1.38E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl tert-Butyl Ether	No	2.80E+00	2.38E+03	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	No	5.29E-01	9.21E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	No	1.54E+03	4.97E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	**Yes**	4.44E-02	9.71E+01	4.00E-02	**9.00E-02**		BDL	BDL	BDL	BDL	BDL	BDL	BDL	9.00E-02	BDL
Toluene	No	7.05E+02	2.35E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	No	2.11E-01	4.88E+02	1.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes (Total)	No	3.68E+01	1.50E+02	2.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SVOCs															
Acenaphthene	No	3.28E+03	6.02E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acenaphthylene	No	1.51E+03	1.98E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Anthracene	No	1.00E+04	2.56E+00	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benz(a)anthracene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(a)pyrene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	No	9.88E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(g,h,i)perylene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(k)fluoranthene	No	1.14E+02	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bis(2-ethylhexyl)phthalate	No	2.80E+01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	No	8.71E+02	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenz(a,h)anthracene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoranthene	No	2.27E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluorene	No	2.25E+03	5.47E+01	2.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexachlorobenzene	No	2.20E-01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1.2.3.cd)pyrene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	No	8.56E+01	1.25E+02	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Phenanthrene	No	1.00E+04	2.80E+01	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Phenol	No	1.00E+04	7.26E+03	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pyrene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PCRs															
C6 - C8 Fraction	No	5.45E+02	1.00E+03	5.00E+00	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C9 - C16 Fraction	No	1.33E+03	3.00E+03	2.00E+02	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C17 - C35 Fraction	No	1.00E+04	5.00E+03	5.00E+02	1.12E+03		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

---- : The parameters were not tested for the samples collected

* indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Detailed Soil Sampling Analytical Results

Parameters	> Criteria	RBRGs Adoped in the CAP (mg/kg)	Soil Saturation Limit (Csat) (mg/kg)	Reporting Limit (mg/kg)	Maximum Value		BH5-0.5m	BH5-3.0-3.45m	BH5-6.0-6.45m	BH6-0.5m	BH6-0.5m (Dup)	BH6-3.0-3.45m	BH6-6.0-6.45m	BH7-0.5m	BH7-3.0-3.45m
Metal															
Antimony	No	2.91E+01	-	1.00E+00	2.00E+00		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	No	2.18E+01	-	1.00E+00	1.60E+01		9.00E+00	3.00E+00	4.00E+00	4.00E+00	4.00E+00	2.00E+00	3.00E+00	4.00E+00	2.00E+00
Barium	No	1.00E+04	-	1.00E+00	9.17E+01		4.81E+01	1.85E+01	3.05E+01	3.43E+01	3.99E+01	3.52E+01	5.02E+01	3.61E+01	4.06E+01
Cadmium	No	7.28E+01	-	2.00E-01	6.00E-01		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (III)	No	1.00E+04	-	1.00E+00	1.80E+01		1.21E+01	4.50E+00	5.20E+00	7.20E+00	7.10E+00	5.20E+00	7.20E+00	8.40E+00	5.20E+00
Chromium (VI)	No	2.18E+02	-	1.00E+00	1.20E+00		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cobalt	No	1.46E+03	-	1.00E+00	5.50E+00		2.40E+00	1.70E+00	2.00E+00	2.20E+00	2.30E+00	1.80E+00	2.10E+00	2.30E+00	1.90E+00
Copper	No	2.91E+03	-	1.00E+00	1.81E+02		1.20E+01	1.50E+01	2.40E+01	1.20E+01	2.90E+01	4.00E+00	1.00E+01	1.90E+01	3.00E+00
Lead	**Yes**	2.55E+02	-	1.00E+00	**1.42E+03**		4.80E+01	3.30E+01	6.00E+01	4.60E+01	5.10E+01	3.00E+01	2.80E+01	5.60E+01	3.00E+01
Manganese	No	1.00E+04	-	1.00E+00	3.54E+03		3.25E+02	2.92E+02	2.35E+02	4.04E+02	4.12E+02	1.91E+02	3.27E+02	4.12E+02	3.12E+02
Mercury	No	6.52E+00	-	5.00E-02	8.00E-02		7.00E-02	BDL	2.00E-01	BDL	BDL	7.00E-02	BDL	BDL	BDL
Molybdenum	No	3.64E+02	-	1.00E+00	1.10E+01		4.00E+00	2.00E+00	3.00E+00	5.00E+00	9.00E+00	1.00E+00	1.00E+00	3.00E+00	2.00E+00
Nickel	No	1.46E+03	-	1.00E+00	1.70E+01		6.00E+00	2.00E+00	3.00E+00	4.00E+00	3.00E+00	2.00E+00	2.00E+00	3.00E+00	2.00E+00
Tin	No	1.00E+04	-	1.00E+00	1.15E+01		6.80E+00	4.60E+00	3.90E+00	5.90E+00	7.20E+00	2.20E+00	2.50E+00	5.30E+00	2.40E+00
Zinc	No	1.00E+04	-	1.00E+00	2.36E+02		1.68E+02	7.20E+01	7.60E+01	7.00E+01	1.04E+02	3.40E+01	4.40E+01	8.20E+01	3.40E+01
VOCs															
2-Propanone (Acetone)	No	4.26E+03	***	5.00E+01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benzene	No	2.79E-01	3.36E+02	2.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Bromodichloromethane	No	1.29E-01	1.03E+03	1.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
2-Butanone (MEK)	No	1.00E+04	***	5.00E+00	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Chloroform	No	5.29E-02	1.10E+03	4.00E-02	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Ethylbenzene	No	2.98E+02	1.38E+02	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Methyl tert-Butyl Ether	No	2.80E+00	2.38E+03	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Methylene Chloride	No	5.29E-01	9.21E+02	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Styrene	No	1.54E+03	4.97E+02	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Tetrachloroethene	**Yes**	4.44E-02	9.71E+01	4.00E-02	**9.00E-02**		BDL	BDL	BDL	----	----	----	----	----	----
Toluene	No	7.05E+02	2.35E+02	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Trichloroethene	No	2.11E-01	4.88E+02	1.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Xylenes (Total)	No	3.68E+01	1.50E+02	2.00E+00	BDL		BDL	BDL	BDL	----	----	----	----	----	----
SVOCs															
Acenaphthene	No	3.28E+03	6.02E+01	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Acenaphthylene	No	1.51E+03	1.98E+01	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Anthracene	No	1.00E+04	2.56E+00	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benz(a)anthracene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benzo(a)pyrene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benzo(b)fluoranthene	No	9.88E+00	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benzo(g,h,i)perylene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Benzo(k)fluoranthene	No	1.14E+02	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Bis(2-ethylhexyl)phthalate	No	2.80E+01	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Chrysene	No	8.71E+02	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Dibenz(a,h)anthracene	No	1.14E+00	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Fluoranthene	No	2.27E+03	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Fluorene	No	2.25E+03	5.47E+01	2.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Hexachlorobenzene	No	2.20E-01	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	No	1.14E+01	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Naphthalene	No	8.56E+01	1.25E+02	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Phenanthrene	No	1.00E+04	2.80E+01	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Phenol	No	1.00E+04	7.26E+03	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
Pyrene	No	1.71E+03	-	5.00E-01	BDL		BDL	BDL	BDL	----	----	----	----	----	----
PCRs															
C6 - C8 Fraction	No	5.45E+02	1.00E+03	5.00E+00	BDL		BDL	BDL	BDL	----	----	----	----	----	----
C9 - C16 Fraction	No	1.33E+03	3.00E+03	2.00E+02	BDL		BDL	BDL	BDL	----	----	----	----	----	----
C17 - C35 Fraction	No	1.00E+04	5.00E+03	5.00E+02	1.12E+03		BDL	BDL	BDL	----	----	----	----	----	----

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

---- : The parameters were not tested for the samples collected

* indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Appendix D Summary of Laboratory Result

Detailed Soil Sampling Analytical Results

Parameters	> Criteria	RBRGs Adoped in the CAP (mg/kg)	Soil Saturation Limit (Csat) (mg/kg)	Reporting Limit (mg/kg)	Maximum Value		BH7-6.0-6.45m	BH8-0.5m	BH8-0.5m (Dup)	BH8-3.0-3.45m	BH8-6.0-6.45m
Metal											
Antimony	No	2.91E+01	-	1.00E+00	2.00E+00		2.00E+00	BDL	BDL	1.00E+00	BDL
Arsenic	No	2.18E+01	-	1.00E+00	1.60E+01		7.00E+00	5.00E+00	4.00E+00	6.00E+00	4.00E+00
Barium	No	1.00E+04	-	1.00E+00	9.17E+01		4.95E+01	2.84E+01	2.91E+01	4.80E+01	4.58E+01
Cadmium	No	7.28E+01	-	2.00E-01	6.00E-01		2.00E-01	BDL	2.00E-01	3.00E-01	BDL
Chromium (III)	No	1.00E+04	-	1.00E+00	1.80E+01		1.18E+01	6.60E+00	6.10E+00	4.81E+01	9.40E+00
Chromium (VI)	No	2.18E+02	-	1.00E+00	1.20E+00		BDL	BDL	BDL	BDL	BDL
Cobalt	No	1.46E+03	-	1.00E+00	5.50E+00		3.60E+00	1.60E+00	1.70E+00	4.60E+00	2.20E+00
Copper	No	2.91E+03	-	1.00E+00	1.81E+02		4.50E+01	1.20E+01	1.10E+01	3.50E+01	1.10E+01
Lead	**Yes**	2.55E+02	-	1.00E+00	**1.42E+03**		3.60E+01	4.20E+01	4.20E+01	3.20E+01	4.20E+01
Manganese	No	1.00E+04	-	1.00E+00	3.54E+03		4.78E+02	3.17E+02	3.17E+02	5.24E+02	2.84E+02
Mercury	No	6.52E+00	-	5.00E-02	8.00E-02		6.00E-02	BDL	BDL	BDL	1.00E-01
Molybdenum	No	3.64E+02	-	1.00E+00	1.10E+01		4.00E+00	2.00E+00	2.00E+00	1.10E+01	2.00E+00
Nickel	No	1.46E+03	-	1.00E+00	1.70E+01		4.00E+00	4.00E+00	3.00E+00	1.70E+01	4.00E+00
Tin	No	1.00E+04	-	1.00E+00	1.15E+01		4.40E+00	5.40E+00	5.20E+00	3.30E+00	3.60E+00
Zinc	No	1.00E+04	-	1.00E+00	2.36E+02		1.08E+02	9.90E+01	1.01E+02	9.00E+01	6.60E+01
VOCs											
2-Propanone (Acetone)	No	4.26E+03	***	5.00E+01	BDL		----	----	----	----	----
Benzene	No	2.79E-01	3.36E+02	2.00E-01	BDL		----	----	----	----	----
Bromodichloromethane	No	1.29E-01	1.03E+03	1.00E-01	BDL		----	----	----	----	----
2-Butanone (MEK)	No	1.00E+04	***	5.00E+00	BDL		----	----	----	----	----
Chloroform	No	5.29E-02	1.10E+03	4.00E-02	BDL		----	----	----	----	----
Ethylbenzene	No	2.98E+02	1.38E+02	5.00E-01	BDL		----	----	----	----	----
Methyl tert-Butyl Ether	No	2.80E+00	2.38E+03	5.00E-01	BDL		----	----	----	----	----
Methylene Chloride	No	5.29E-01	9.21E+02	5.00E-01	BDL		----	----	----	----	----
Styrene	No	1.54E+03	4.97E+02	5.00E-01	BDL		----	----	----	----	----
Tetrachloroethene	**Yes**	4.44E-02	9.71E+01	4.00E-02	**9.00E-02**		----	----	----	----	----
Toluene	No	7.05E+02	2.35E+02	5.00E-01	BDL		----	----	----	----	----
Trichloroethene	No	2.11E-01	4.88E+02	1.00E-01	BDL		----	----	----	----	----
Xylenes (Total)	No	3.68E+01	1.50E+02	2.00E+00	BDL		----	----	----	----	----
SVOCs											
Acenaphthene	No	3.28E+03	6.02E+01	5.00E-01	BDL		----	----	----	----	----
Acenaphthylene	No	1.51E+03	1.98E+01	5.00E-01	BDL		----	----	----	----	----
Anthracene	No	1.00E+04	2.56E+00	5.00E-01	BDL		----	----	----	----	----
Benz(a)anthracene	No	1.14E+01	-	5.00E-01	BDL		----	----	----	----	----
Benzo(a)pyrene	No	1.14E+00	-	5.00E-01	BDL		----	----	----	----	----
Benzo(b)fluoranthene	No	9.88E+00	-	5.00E-01	BDL		----	----	----	----	----
Benzo(g,h,i)perylene	No	1.71E+03	-	5.00E-01	BDL		----	----	----	----	----
Benzo(k)fluoranthene	No	1.14E+02	-	5.00E-01	BDL		----	----	----	----	----
Bis(2-ethylhexyl)phthalate	No	2.80E+01	-	5.00E-01	BDL		----	----	----	----	----
Chrysene	No	8.71E+02	-	5.00E-01	BDL		----	----	----	----	----
Dibenz(a,h)anthracene	No	1.14E+00	-	5.00E-01	BDL		----	----	----	----	----
Fluoranthene	No	2.27E+03	-	5.00E-01	BDL		----	----	----	----	----
Fluorene	No	2.25E+03	5.47E+01	2.00E-01	BDL		----	----	----	----	----
Hexachlorobenzene	No	2.20E-01	-	5.00E-01	BDL		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	No	1.14E+01	-	5.00E-01	BDL		----	----	----	----	----
Naphthalene	No	8.56E+01	1.25E+02	5.00E-01	BDL		----	----	----	----	----
Phenanthrene	No	1.00E+04	2.80E+01	5.00E-01	BDL		----	----	----	----	----
Phenol	No	1.00E+04	7.26E+03	5.00E-01	BDL		----	----	----	----	----
Pyrene	No	1.71E+03	-	5.00E-01	BDL		----	----	----	----	----
PCRs											
C6 - C8 Fraction	No	5.45E+02	1.00E+03	5.00E+00	BDL		----	----	----	----	----
C9 - C16 Fraction	No	1.33E+03	3.00E+03	2.00E+02	BDL		----	----	----	----	----
C17 - C35 Fraction	No	1.00E+04	5.00E+03	5.00E+02	1.12E+03		----	----	----	----	----

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

---- : The parameters were not tested for the samples collected

* indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Groundwater Sampling Analytical Results Summary table

Chemical	Frequency of Detection (x/y)	Range of Detected Concentration	Range of Method Reporting	Analytical Method	Relevant Land Use Categories	Most Stringent RBRG (mg/L)	Solubility Limit (mg/L)	Maximum Detected Concentration Exceeds (check if applicable)	
Metal									
Mercury	0/11	BDL	5.00E-04	USEPA 3112B	Most Stringent	1.84E-01	-	NO	-
VOCs									
2-Propanone (Acetone)	3/8	BDL - 7.54	5.00E-01	USEPA 8260	Most Stringent	1.00E+04	***	-	-
Benzene	2/8	BDL - 0.0642	5.00E-03	USEPA 8260	Most Stringent	1.49E+00	1.75E+03	NO	NO
Bromodichloromethane	0/8	BDL	5.00E-03	USEPA 8260	Most Stringent	8.71E-01	6.74E+03	NO	NO
2-Butanone (MEK)	2/8	BDL - 0.448	5.00E-02	USEPA 8260	Most Stringent	1.00E+04	***	NO	NO
Chloroform	2/8	BDL - 0.009	5.00E-03	USEPA 8260	Most Stringent	3.82E-01	7.92E+03	NO	NO
Ethylbenzene	1/8	BDL - 0.0379	5.00E-03	USEPA 8260	Most Stringent	3.91E+02	1.69E+02	NO	NO
Methyl tert-Butyl Ether	0/8	BDL	5.00E-03	USEPA 8260	Most Stringent	6.11E+01	***	-	-
Methylene Chloride	1/8	BDL - 0.057	5.00E-02	USEPA 8260	Most Stringent	7.59E+00	***	-	-
Styrene	0/8	BDL	5.00E-03	USEPA 8260	Most Stringent	1.16E+03	3.10E+02	NO	NO
Tetrachloroethene	0/8	BDL	5.00E-03	USEPA 8260	Most Stringent	9.96E-02	2.00E+02	NO	NO
Toluene	1/8	BDL - 0.01	5.00E-03	USEPA 8260	Most Stringent	1.97E+03	5.26E+02	NO	NO
Trichloroethene	0/8	BDL	5.00E-03	USEPA 8260	Most Stringent	4.81E-01	1.10E+03	NO	NO
Xylenes (Total)	1/8	BDL - 0.126	2.00E-02	USEPA 8260	Most Stringent	4.33E+01	1.75E+02	NO	NO
SVOCs									
Acenaphthene	1/8	BDL - 0.0021	2.00E-03	USEPA 8270	Most Stringent	7.09E+03	4.24E+00	NO	NO
Acenaphthylene	0/8	BDL	2.00E-03	USEPA 8270	Most Stringent	5.42E+02	3.93E+00	NO	NO
Anthracene	1/8	BDL	2.00E-03	USEPA 8270	Most Stringent	1.00E+04	4.34E-02	NO	NO
Benzo(b)fluoranthene	1/8	BDL	1.00E-03	USEPA 8270	Most Stringent	2.03E-01	1.50E-03	NO	NO
Chrysene	0/8	BDL	1.00E-03	USEPA 8270	Most Stringent	2.19E+01	1.60E-03	NO	NO
Fluoranthene	0/8	BDL	2.00E-03	USEPA 8270	Most Stringent	1.00E+04	2.06E-01	NO	NO
Fluorene	0/8	BDL	2.00E-03	USEPA 8270	Most Stringent	1.00E+04	1.98E+00	NO	NO
Hexachlorobenzene	0/5	BDL	4.00E-03	USEPA 8270	Most Stringent	2.34E-02	-	NO	NO
Naphthalene	1/8	BDL - 0.0035	2.00E-03	USEPA 8270	Most Stringent	2.37E+01	3.10E+01	NO	NO
Phenanthrene	1/8	BDL - 0.0044	2.00E-03	USEPA 8270	Most Stringent	1.00E+04	1.00E+00	NO	NO
Pyrene	0/8	BDL	2.00E-03	USEPA 8270	Most Stringent	1.00E+04	1.35E-01	NO	NO
Petroleum Carbon Ranges									
C6 - C8 Fraction	2/8	BDL - 0.08	2.00E-02	USEPA 8260/8015	Most Stringent	3.17E+01	5.23E+00	NO	NO
C9 - C16 Fraction	7/8	BDL - 1.3	5.00E-01	USEPA 8260/8015	Most Stringent	2.76E+02	2.80E+00	NO	NO
C17 - C35 Fraction	8/8	1.2 - 63.8	5.00E-01	USEPA 8260/8015	Most Stringent	4.93E+00	2.80E+00	**YES**	**YES**

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

* 1.00E+04 mg/L indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Detailed Groundwater Sampling Analytical Results

Parameters	> Criteria (RBRG)	RBRG Adopted in CAP (mg/L)*	Solubility Limit (mg/L)	Reporting Limit (mg/L)	Maximum Value (mg/L)	S1-W	S2-W	S2-W-dup	BH1-G.W.	BH2-G.W.	BH3-G.W.
Metal											
Mercury	No	1.84E-01	-	5.00E-04	BDL	BDL	BDL	BDL	BDL	BDL	BDL
VOCs											
2-Propanone (Acetone)	No	1.00E+04	***	5.00E-01	7.54E+00	7.54E+00	1.09E+00	1.15E+00	BDL	BDL	BDL
Benzene	No	1.49E+00	1.75E+03	5.00E-03	6.42E-02	6.42E-02	BDL	BDL	2.32E-02	BDL	BDL
Bromodichloromethane	No	8.71E-01	6.74E+03	5.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	No	1.00E+04	***	5.00E-02	4.48E-01	BDL	BDL	BDL	BDL	2.46E-01	4.48E-01
Chloroform	No	3.82E-01	7.92E+03	5.00E-03	9.00E-03	9.00E-03	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	No	3.91E+02	1.69E+02	5.00E-03	3.79E-02	3.79E-02	BDL	BDL	BDL	BDL	BDL
Methyl tert-Butyl Ether	No	6.11E+01	***	5.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	No	7.59E+00	***	5.00E-02	5.70E-02	5.70E-02	BDL	BDL	BDL	BDL	BDL
Styrene	No	1.16E+03	3.10E+02	5.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	No	9.96E-02	2.00E+02	5.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	No	1.97E+03	5.26E+02	5.00E-03	1.00E-02	1.00E-02	BDL	BDL	BDL	BDL	BDL
Trichloroethene	No	4.81E-01	1.10E+03	5.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes (Total)	No	4.33E+01	1.75E+02	2.00E-02	1.26E-01	1.26E-01	BDL	BDL	BDL	BDL	BDL
SVOCs											
Acenaphthene	No	7.09E+03	4.24E+00	2.00E-03	2.10E-03	2.10E-03	BDL	BDL	BDL	BDL	BDL
Acenaphthylene	No	5.42E+02	3.93E+00	2.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Anthracene	No	1.00E+04	4.34E-02	2.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(b)fluoranthene	No	2.03E-01	1.50E-03	1.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	No	2.19E+01	1.60E-03	1.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoranthene	No	1.00E+04	2.06E-01	2.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluorene	No	1.00E+04	1.98E+00	2.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexachlorobenzene	No	2.34E-02	6.02E+00	4.00E-03	BDL	----	----	----	BDL	BDL	BDL
Naphthalene	No	2.37E+01	3.10E+01	2.00E-03	3.50E-03	3.50E-03	BDL	BDL	BDL	BDL	BDL
Phenanthrene	No	1.00E+04	1.00E+00	2.00E-03	4.40E-03	4.40E-03	BDL	BDL	BDL	BDL	BDL
Pyrene	No	1.00E+04	1.35E-01	2.00E-03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PCRs											
C6 - C8 Fraction	No	3.17E+01	5.23E+00	2.00E-02	8.00E-02	8.00E-02	BDL	BDL	3.00E-02	BDL	BDL
C9 - C16 Fraction	No	2.76E+02	2.80E+00	5.00E-01	1.30E+00	1.10E+00	8.00E-01	7.00E-01	BDL	1.30E+00	1.10E+00
C17 - C35 Fraction	**Yes**	4.93E+00	2.80E+00	5.00E-01	6.38E+01	**6.38E+01**	2.00E+00	2.00E+00	2.90E+00	2.60E+00	2.80E+00

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

----: The parameters were not tested for the samples collected

* 1.00E+04 mg/L indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

Detailed Groundwater Sampling Analytical Results

Parameters	> Criteria (RBRG)	RBRG Adopted in CAP (mg/L)*	Solubility Limit (mg/L)	Reporting Limit (mg/L)	Maximum Value (mg/L)	BH4-G.W.	BH5-G.W.	BH6-G.W.	BH7-G.W.	BH8-G.W.
Metal										
Mercury	No	1.84E-01	-	5.00E-04	BDL	BDL	BDL	BDL	BDL	BDL
VOCs										
2-Propanone (Acetone)	No	1.00E+04	***	5.00E-01	7.54E+00	BDL	BDL	----	----	----
Benzene	No	1.49E+00	1.75E+03	5.00E-03	6.42E-02	BDL	BDL	----	----	----
Bromodichloromethane	No	8.71E-01	6.74E+03	5.00E-03	BDL	BDL	BDL	----	----	----
2-Butanone (MEK)	No	1.00E+04	***	5.00E-02	4.48E-01	BDL	BDL	----	----	----
Chloroform	No	3.82E-01	7.92E+03	5.00E-03	9.00E-03	5.00E-03	BDL	----	----	----
Ethylbenzene	No	3.91E+02	1.69E+02	5.00E-03	3.79E-02	BDL	BDL	----	----	----
Methyl tert-Butyl Ether	No	6.11E+01	***	5.00E-03	BDL	BDL	BDL	----	----	----
Methylene Chloride	No	7.59E+00	***	5.00E-02	5.70E-02	BDL	BDL	----	----	----
Styrene	No	1.16E+03	3.10E+02	5.00E-03	BDL	BDL	BDL	----	----	----
Tetrachloroethene	No	9.96E-02	2.00E+02	5.00E-03	BDL	BDL	BDL	----	----	----
Toluene	No	1.97E+03	5.26E+02	5.00E-03	1.00E-02	BDL	BDL	----	----	----
Trichloroethene	No	4.81E-01	1.10E+03	5.00E-03	BDL	BDL	BDL	----	----	----
Xylenes (Total)	No	4.33E+01	1.75E+02	2.00E-02	1.26E-01	BDL	BDL	----	----	----
SVOCs										
Acenaphthene	No	7.09E+03	4.24E+00	2.00E-03	2.10E-03	BDL	BDL	----	----	----
Acenaphthylene	No	5.42E+02	3.93E+00	2.00E-03	BDL	BDL	BDL	----	----	----
Anthracene	No	1.00E+04	4.34E-02	2.00E-03	BDL	BDL	BDL	----	----	----
Benzo(b)fluoranthene	No	2.03E-01	1.50E-03	1.00E-03	BDL	BDL	BDL	----	----	----
Chrysene	No	2.19E+01	1.60E-03	1.00E-03	BDL	BDL	BDL	----	----	----
Fluoranthene	No	1.00E+04	2.06E-01	2.00E-03	BDL	BDL	BDL	----	----	----
Fluorene	No	1.00E+04	1.98E+00	2.00E-03	BDL	BDL	BDL	----	----	----
Hexachlorobenzene	No	2.34E-02	6.02E+00	4.00E-03	BDL	BDL	BDL	----	----	----
Naphthalene	No	2.37E+01	3.10E+01	2.00E-03	3.50E-03	BDL	BDL	----	----	----
Phenanthrene	No	1.00E+04	1.00E+00	2.00E-03	4.40E-03	BDL	BDL	----	----	----
Pyrene	No	1.00E+04	1.35E-01	2.00E-03	BDL	BDL	BDL	----	----	----
PCRs										
C6 - C8 Fraction	No	3.17E+01	5.23E+00	2.00E-02	8.00E-02	BDL	BDL	----	----	----
C9 - C16 Fraction	No	2.76E+02	2.80E+00	5.00E-01	1.30E+00	1.10E+00	1.10E+00	----	----	----
C17 - C35 Fraction	**Yes**	4.93E+00	2.80E+00	5.00E-01	6.38E+01	4.20E+00	1.20E+00	----	----	----

Noted: BDL denotes below detection limit.

Exceeded value(s) is/are bolded

- : No values are available in Table 2.2 of the GM for Use of RBRG for Contaminated Land Management

----: The parameters were not tested for the samples collected

* 1.00E+04 mg/L indicates a 'ceiling limit' concentration

*** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

APPENDIX E
LABORATORY TESTING REPORTS

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 14
Contact	: MR JASON LAU	Contact	: Richard Fung	Work Order	: HK1863396
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
E-mail	: jason.lau@gammonconstruction.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: DSD CONTRACT NO. DC/2015/01 LAND CONTAMINATION TESTING IN TAI SHUI HANG, MA ON SHAN			Date Samples Received	: 05-Dec-2018
Order number	:	Quote number	: HKE/2925/2018	Issue Date	: 27-Dec-2018
C-O-C number	: H037690			No. of samples received	: 3
Site	: VEHICLE DETENTION CENTRE. TAI SHUI HANG			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Leung Chak Cheong , Mike	Senior Chemist	Metals

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. Testing period is from 05-Dec-2018 to 20-Dec-2018.

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: HK1863396

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	S1-1	S2-1	----	----	----
			Client sampling date / time	05-Dec-2018 11:00	05-Dec-2018 11:05	----	----	----
Compound	CAS Number	LOR	Unit	HK1863396-001	HK1863396-002	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	15.0	20.4	----	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	----	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	5	8	----	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	48.3	54.5	----	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	----	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	2.4	3.0	----	----	----
EG020: Copper	7440-50-8	1	mg/kg	14	17	----	----	----
EG020: Lead	7439-92-1	1	mg/kg	65	49	----	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	291	274	----	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	0.08	----	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	3	8	----	----	----
EG020: Nickel	7440-02-0	1	mg/kg	4	5	----	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	6.0	4.9	----	----	----
EG020: Zinc	7440-66-6	1	mg/kg	101	149	----	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	7.1	18.0	----	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	----	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	----	----	----

Sub-Matrix: SOIL			Client sample ID	S1-1	S2-1	----	----	----
			Client sampling date / time	05-Dec-2018 11:00	05-Dec-2018 11:05	----	----	----
Compound	CAS Number	LOR	Unit	HK1863396-001	HK1863396-002	-------	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	1120	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	----	----	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	----	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	----	----	----
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	----	----	----

Sub-Matrix: SOIL			Client sample ID	S1-1	S2-1	----	----	----
			Client sampling date / time	05-Dec-2018 11:00	05-Dec-2018 11:05	----	----	----
Compound	CAS Number	LOR	Unit	HK1863396-001	HK1863396-002	-------	-------	-------
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	77.7	67.2	----	----	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	83.0	67.3	----	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	108	109	----	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	104	103	----	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	95.0	96.7	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	108	109	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	104	103	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	95.0	96.7	----	----	----

Sub-Matrix: WATER			Client sample ID	Trip Blank	---	---	---	---
			Client sampling date / time	05-Dec-2018 11:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1863396-003	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	---	---	---	---
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	---	---	---	---
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	---	---	---	---
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	---	---	---	---
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	---	---	---	---
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	**105**	---	---	---	---
EP074_SR: Toluene-D8	2037-26-5	0.1	%	**104**	---	---	---	---
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	**93.3**	---	---	---	---

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: 2090024)								
HK1862840-063	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.2	15.5	4.46
HK1862840-077	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	9.6	9.8	1.95
EG: Metals and Major Cations (QC Lot: 2092933)								
HK1863396-002	S2-1	**EG020: Mercury**	7439-97-6	0.05	mg/kg	0.08	0.09	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	54.5	53.3	2.18
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.0	2.6	13.1
		EG020: Manganese	7439-96-5	0.5	mg/kg	274	283	3.11
		EG020: Tin	7440-31-5	0.5	mg/kg	4.9	4.7	4.32
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	8	8	0.00
		EG020: Copper	7440-50-8	1	mg/kg	17	17	0.00
		EG020: Lead	7439-92-1	1	mg/kg	49	43	13.8
		EG020: Molybdenum	7439-98-7	1	mg/kg	8	7	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	5	5	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	149	170	13.2
EG: Metals and Major Cations (QC Lot: 2100376)								
HK1863396-002	S2-1	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065)								
HK1863396-001	S1-1	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065) - Continued								
HK1863396-001	S1-1	**Benzo(k)fluoranthene**	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)								
HK1863062-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2086066)								
HK1863396-001	S1-1	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2074914)								
HK1862840-077	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.1	<0.1	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.2	<0.2	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	<0.4	0.00
		Xylenes (Total)	----	1	mg/kg	<1.0	<1.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2074914)								
HK1862840-077	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<2	<2	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<2	<2	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2074914)								
HK1862840-077	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2074914)								
HK1862840-077	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2074914)								
HK1862840-077	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.00

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: 2092933)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	92.6	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.5	----	85	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	87.6	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	94.1	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	90.2	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	94.2	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	98.6	----	92	115	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	86.9	----	85	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	107	----	87	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	93.2	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	91.2	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	92.6	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	111	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 2100376)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	87.5	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	68.2	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	66.4	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	70.0	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	71.4	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	85.4	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	65.8	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	87.4	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	86.1	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	81.7	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	89.1	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	88.2	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	96.8	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	61.8	----	47	87	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065) - Continued											
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	85.8	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	91.2	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	85.8	----	49	120	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	109	----	78	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2086066)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	92.0	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	81.4	----	51	115	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2074914)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	108	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	101	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	106	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	104	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	104	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	104	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2074914)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	101	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	111	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2074914)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	100	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	99.6	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	95.3	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2074914)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	101	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	100	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2074914)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	94.5	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	105	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	107	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	98.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	95.8	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.6	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.7	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2079435)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.3	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	112	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2079435)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	95.5	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	108	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	109	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2079435)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	107	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	87.8	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2079435)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	98.1	----	67	117	----	----

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: 2092933)										
HK1863396-001	S1-1	**EG020: Antimony**	7440-36-0	5 mg/kg	93.4	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	91.8	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	93.7	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	88.5	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	77.0	----	75	125	----	----
		EG020: Lead	7439-92-1	50 mg/kg	87.2	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	1 mg/kg	84.4	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	97.4	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	85.3	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	92.8	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2100376)										
HK1863396-001	S1-1	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	89.3	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065)										
HK1863396-002	S2-1	**Naphthalene**	91-20-3	250 µg/kg	74.6	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	75.8	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	75.6	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	73.0	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	82.6	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	86.7	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	77.7	----	50	130	----	----
		Pyrene	129-00-0	250 µg/kg	78.0	----	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 (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2086065) - Continued										
HK1863396-002	S2-1	Benz(a)anthracene	56-55-3	250 µg/kg	80.3	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	80.8	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	84.7	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	75.0	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	76.9	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	67.8	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	69.7	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	64.5	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)										
HK1863062-001	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	99.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2086066)										
HK1863774-001	Anonymous	C9 - C16 Fraction	----	31.5 mg/kg	75.7	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	68.3	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2074914)										
HK1862840-077	Anonymous	Benzene	71-43-2	0.25 mg/kg	103	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	102	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	107	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	114	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	111	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	103	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	110	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2074914)										
HK1862840-077	Anonymous	2-Propanone (Acetone)	67-64-1	2.5 mg/kg	98.1	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	104	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2074914)										
HK1862840-077	Anonymous	Methylene chloride	75-09-2	0.25 mg/kg	103	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	106	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	110	----	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-074_SR-G: Trihalomethanes (THM) (QC Lot: 2074914)										
HK1862840-077	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	103	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	97.2	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2074914)										
HK1862840-077	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	103	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-074_SR-S: 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	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 15
Contact	: MR JASON LAU	Contact	: Richard Fung	Work Order	: HK1864051
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: jason.lau@gammonconstruction.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: -----	Telephone	: +852 2610 1044		
Facsimile	: -----	Facsimile	: +852 2610 2021		
Project	: DSD CONTRACT NO. DC/2015/01 LAND CONTAMINATION TESTING IN TAI SHUI HANG, MA ON SHAN			Date Samples Received	: 08-Dec-2018
Order number	: -----	Quote number	: HKE/2925/2018	Issue Date	: 21-Dec-2018
C-O-C number	: H037694			No. of samples received	: 2
Site	: VEHICLE DETENTION CENTRE. TAI SHUI HANG			No. of samples analysed	: 2

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals
Lin Wai Yu , Iris	Assistant Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 08-Dec-2018 to 21-Dec-2018.

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: HK1864051

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	S2-2 (1.4m-1.85m)	---	---	---	---
			Client sampling date / time	08-Dec-2018 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1864051-001	-------	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	13.1	---	---	---	---
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	---	---	---	---
EG020: Arsenic	7440-38-2	1	mg/kg	4	---	---	---	---
EG020: Barium	7440-39-3	1.0	mg/kg	32.3	---	---	---	---
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	---	---	---	---
EG020: Cobalt	7440-48-4	1.0	mg/kg	2.6	---	---	---	---
EG020: Copper	7440-50-8	1	mg/kg	13	---	---	---	---
EG020: Lead	7439-92-1	1	mg/kg	64	---	---	---	---
EG020: Manganese	7439-96-5	1.0	mg/kg	244	---	---	---	---
EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	---	---	---	---
EG020: Molybdenum	7439-98-7	1	mg/kg	3	---	---	---	---
EG020: Nickel	7440-02-0	1	mg/kg	5	---	---	---	---
EG020: Tin	7440-31-5	1.0	mg/kg	4.8	---	---	---	---
EG020: Zinc	7440-66-6	1	mg/kg	68	---	---	---	---
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	11.0	---	---	---	---
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	---	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	---	---	---	---

Sub-Matrix: SOIL			Client sample ID	S2-2 (1.4m-1.85m)	---	---	---	---
			Client sampling date / time	08-Dec-2018 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1864051-001	------	------	------	------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	---	---	---	---
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	---	---	---	---
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	---	---	---	---
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	---	---	---	---
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	---	---	---	---
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	---	---	---	---
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	---	---	---	---
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	---	---	---	---
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	---	---	---	---
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	---	---	---	---
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	---	---	---	---
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	---	---	---	---
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	---	---	---	---
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	---	---	---	---
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	---	---	---	---
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	---	---	---	---
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	---	---	---	---
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	---	---	---	---
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	---	---	---	---
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	---	---	---	---

Sub-Matrix: SOIL			Client sample ID	S2-2 (1.4m-1.85m)	---	---	---	---
			Client sampling date / time	08-Dec-2018 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1864051-001	-------	-------	-------	-------
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	64.9	---	---	---	---
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	65.5	---	---	---	---
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	---	---	---	---
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	104	---	---	---	---
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	95.9	---	---	---	---
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	---	---	---	---
EP074_SR: Toluene-D8	2037-26-5	0.1	%	104	---	---	---	---
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	95.9	---	---	---	---

Sub-Matrix: WATER			Client sample ID	trip blank	---	---	---	---
			Client sampling date / time	08-Dec-2018 12:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1864051-002	-------	-------	-------	-------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	---	---	---	---
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	---	---	---	---
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	---	---	---	---
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	---	---	---	---
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	---	---	---	---
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	**108**	---	---	---	---
EP074_SR: Toluene-D8	2037-26-5	0.1	%	**105**	---	---	---	---
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	**94.6**	---	---	---	---

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: 2091507)								
HK1864039-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	15.5	16.1	3.85
HK1864039-011	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	2.6	2.7	0.00
EG: Metals and Major Cations (QC Lot: 2100376)								
HK1863396-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)								
HK1864051-001	S2-2 (1.4m-1.85m)	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)								
HK1863062-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)								
HK1864051-001	S2-2 (1.4m-1.85m)	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982) - Continued								
HK1864039-011	Anonymous	**Styrene**	100-42-5	0.2	mg/kg	<0.2	<0.2	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)								
HK1864039-011	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<2	<2	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<2	<2	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.00

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: 2100376)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	87.5	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 2104492)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	89.2	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.8	----	85	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	87.8	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	91.8	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	93.6	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	100.0	----	89	114	----	----

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: 2104492) - Continued											
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	107	----	92	115	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	86.0	----	85	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	97.0	----	87	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	92.9	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	94.4	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	89.5	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	95.9	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	68.2	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	65.4	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	72.3	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	76.1	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	87.9	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	63.8	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	89.8	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	88.1	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	82.8	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	90.6	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	93.9	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	102	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	57.8	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	106	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	107	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	110	----	49	120	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	109	----	78	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.2	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	79.1	----	51	115	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)											

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982) - Continued											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	82.7	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	84.1	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	86.7	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	85.3	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	85.0	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	85.2	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	85.3	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	84.3	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	86.1	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	81.9	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	82.4	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	83.1	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	84.1	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	83.2	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	81.3	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	105	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	107	----	77	118	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435) - Continued											
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	98.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	95.8	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.6	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.7	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2079435)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.3	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	112	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2079435)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	95.5	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	108	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	109	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2079435)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	107	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	87.8	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2079435)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	98.1	----	67	117	----	----

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: 2100376)										
HK1863396-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	89.3	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2104492)										
HK1864051-001	S2-2 (1.4m-1.85m)	**EG020: Antimony**	7440-36-0	5 mg/kg	87.8	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	90.3	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	89.8	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	94.2	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	85.4	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	79.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	92.6	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	93.2	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	87.5	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)										
HK1864051-001	S2-2 (1.4m-1.85m)	**Naphthalene**	91-20-3	250 µg/kg	73.5	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	72.2	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	77.0	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	74.1	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	81.7	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	83.9	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	78.0	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787) - Continued										
HK1864051-001	S2-2 (1.4m-1.85m)	**Pyrene**	129-00-0	250 µg/kg	77.8	----	50	130	----	----
		Benz(a)anthracene	56-55-3	250 µg/kg	77.1	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	77.7	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	83.5	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	80.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	81.6	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	87.0	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	91.2	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	90.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)										
HK1863062-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	99.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)										
HK1864051-001	S2-2 (1.4m-1.85m)	**C9 - C16 Fraction**	----	31.5 mg/kg	88.5	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	64.4	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	102	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	112	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	105	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	97.0	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	88.7	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	106	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	100	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)										
HK1864039-012	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	107	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	114	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	105	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	109	----	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-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982) - Continued										
HK1864039-012	Anonymous	**Tetrachloroethene**	127-18-4	0.25 mg/kg	98.8	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	109	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	92.6	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	115	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-074_SR-S: 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	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR JASON LAU	Contact	: Richard Fung	Work Order	: HK1864230
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Jason.lau@gammonconstruction.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: DSD CONTRACT NO. DC/2015/01 LAND CONTAMINATION TESTING IN TAI SHUI HANG, MA ON SHAN			Date Samples Received	: 10-Dec-2018
Order number	:	Quote number	: HKE/2925/2018	Issue Date	: 22-Dec-2018
C-O-C number	: H037691			No. of samples received	: 3
Site	: VEHICLE DETENTION CENTRE. TAI SHUI HANG			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals

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. Testing period is from 10-Dec-2018 to 22-Dec-2018.

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: HK1864230

Sample(s) were received in chilled condition.

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

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

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: Field Blank Client sampling date / time: 10-Dec-2018 15:30 HK1864230-001	Equipment Blank 10-Dec-2018 15:30 HK1864230-002	Trip Blank 10-Dec-2018 15:30 HK1864230-003	--- ---- -------	--- ---- -------
EG: Metals and Major Cations - Filtered								
EG020: Antimony	7440-36-0	1	µg/L	<1	<1	---	---	---
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	---	---	---
EG020: Barium	7440-39-3	1	µg/L	<1	<1	---	---	---
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	---	---	---
EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	---	---	---
EG020: Copper	7440-50-8	1	µg/L	<1	<1	---	---	---
EG020: Lead	7439-92-1	1	µg/L	<1	<1	---	---	---
EG020: Manganese	7439-96-5	1	µg/L	<1	<1	---	---	---
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	---	---	---
EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	---	---	---
EG020: Nickel	7440-02-0	1	µg/L	<1	<1	---	---	---
EG020: Tin	7440-31-5	1	µg/L	<1	<1	---	---	---
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	---	---	---
EG049: Trivalent Chromium	16065-83-1	20	µg/L	<20	<20	---	---	---
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Acenaphthene	83-32-9	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Fluorene	86-73-7	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Phenanthrene	85-01-8	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Anthracene	120-12-7	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Fluoranthene	206-44-0	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Pyrene	129-00-0	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	---	---	---
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	---	---	---
EP076HK: Benzo(k)fluoranthene	207-08-9	2.0	µg/L	<2.0	<2.0	---	---	---
EP076HK: Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0	<2.0	---	---	---

Sub-Matrix: WATER			Client sample ID	Field Blank	Equipment Blank	Trip Blank	----	----
			Client sampling date / time	10-Dec-2018 15:30	10-Dec-2018 15:30	10-Dec-2018 15:30	----	----
Compound	CAS Number	LOR	Unit	HK1864230-001	HK1864230-002	HK1864230-003	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0	<2.0	----	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0	<2.0	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0	<2.0	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L	<20	<20	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L	<500	<500	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L	<500	<500	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	<10	<10	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	<20	<20	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	<500	<500	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	<50	<50	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	<5.0	<5.0	----	----
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	**53.5**	**50.6**	----	----	----

Sub-Matrix: WATER			Client sample ID	Field Blank	Equipment Blank	Trip Blank	----	----
			Client sampling date / time	10-Dec-2018 15:30	10-Dec-2018 15:30	10-Dec-2018 15:30	----	----
Compound	CAS Number	LOR	Unit	HK1864230-001	HK1864230-002	HK1864230-003	--------	--------
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates - Continued								
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	96.0	87.1	----	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	106	110	----	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	105	----	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	94.7	93.8	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	106	110	109	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	105	106	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	94.7	93.8	94.2	----	----

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: 2087609)								
HK1864230-001	Field Blank	**EG020: Cadmium**	7440-43-9	0.2	µg/L	<0.2	<0.2	0.00
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00
		EG020: Antimony	7440-36-0	1	µg/L	<1	<1	0.00
		EG020: Barium	7440-39-3	1	µg/L	<1	<1	0.00
		EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	0.00
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.00
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.00
		EG020: Manganese	7439-96-5	1	µg/L	<1	<1	0.00
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.00
		EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.00
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.00
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.00
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.00
EG: Metals and Major Cations - Filtered (QC Lot: 2109992)								
HK1864230-002	Equipment Blank	**EG050: Hexavalent Chromium**	18540-29-9	20	µg/L	<20	<20	0.00

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: 2087609)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	89.5	----	89	110	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	95.6	----	85	112	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	87.7	----	85	111	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	88.8	----	85	111	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	92.7	----	85	113	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	95.5	----	85	113	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	92.0	----	85	113	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	90.4	----	85	114	----	----

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: 2087609) - Continued											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	98.3	----	85	115	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	89.0	----	89	110	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	93.4	----	85	113	----	----
EG020: Tin	7440-31-5	1	µg/L	<1	100 µg/L	96.2	----	88	110	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	95.1	----	85	113	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2109992)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	100	----	80	106	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2081545)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.0	----	27	121	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	56.6	----	24	128	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	57.8	----	23	122	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	58.0	----	13	141	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	66.5	----	22	139	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	67.1	----	16	136	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	83.4	----	68	124	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	85.3	----	71	121	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	87.0	----	76	111	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	89.8	----	73	125	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	89.7	----	75	129	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	96.7	----	77	118	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	86.8	----	52	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	85.5	----	60	129	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	90.6	----	61	130	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	85.6	----	47	144	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2082461)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	101	----	69	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2087549)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	102	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	116	----	54	129	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435)											

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435) - Continued											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	105	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	107	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	98.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	95.8	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.6	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.7	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2079435)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.3	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	112	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2079435)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	95.5	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	108	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	109	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2079435)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	107	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	87.8	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2079435)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	98.1	----	67	117	----	----

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: 2087609)										
HK1864039-014	Anonymous	**EG020: Antimony**	7440-36-0	100 µg/L	88.9	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	94.3	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	92.3	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	87.1	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	96.6	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	95.9	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	92.6	----	75	125	----	----
		EG020: Manganese	7439-96-5	100 µg/L	95.8	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	102	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	88.5	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	97.7	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	87.9	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	94.7	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2109992)										
HK1864230-001	Field Blank	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	103	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates - Continued			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 15
Contact	: MR JASON LAU	Contact	: Richard Fung	Work Order	: HK1864557
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Jason.lau@gammonconstruction.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: DSD CONTRACT NO. DC/2015/01 LAND CONTAMINATION TESTING IN TAI SHUI HANG, MA ON SHAN			Date Samples Received	: 12-Dec-2018
Order number	:	Quote number	: HKE/2925/2018	Issue Date	: 27-Dec-2018
C-O-C number	: H037692			No. of samples received	: 4
Site	: VEHICLE DETENTION CENTRE. TAI SHUI HANG			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Lin Wai Yu , Iris	Assistant Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 12-Dec-2018 to 21-Dec-2018.

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: HK1864557

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	S1-2	S1-3	S1-2 (Duplicate)	----	----
			Client sampling date / time	12-Dec-2018 09:00	12-Dec-2018 14:00	12-Dec-2018 09:00	----	----
Compound	CAS Number	LOR	Unit	HK1864557-001	HK1864557-003	HK1864557-004	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	12.0	15.7	13.4	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	4	2	3	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	53.6	21.8	55.8	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	<0.2	0.6	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	2.9	2.0	2.6	----	----
EG020: Copper	7440-50-8	1	mg/kg	17	7	10	----	----
EG020: Lead	7439-92-1	1	mg/kg	50	83	41	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	550	1180	487	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.08	<0.05	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	3	8	2	----	----
EG020: Nickel	7440-02-0	1	mg/kg	4	2	3	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	3.9	6.0	3.2	----	----
EG020: Zinc	7440-66-6	1	mg/kg	72	64	65	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	9.5	4.3	4.9	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	<1.0	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	----	----

Sub-Matrix: SOIL			Client sample ID	S1-2	S1-3	S1-2 (Duplicate)	----	----
			Client sampling date / time	12-Dec-2018 09:00	12-Dec-2018 14:00	12-Dec-2018 09:00	----	----
Compound	CAS Number	LOR	Unit	HK1864557-001	HK1864557-003	HK1864557-004	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0	----	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	<50	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	<0.04	----	----
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	<0.04	----	----
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Sub-Matrix: SOIL			Client sample ID	S1-2	S1-3	S1-2 (Duplicate)	----	----
			Client sampling date / time	12-Dec-2018 09:00	12-Dec-2018 14:00	12-Dec-2018 09:00	----	----
Compound	CAS Number	LOR	Unit	HK1864557-001	HK1864557-003	HK1864557-004	-------	-------
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	60.7	68.3	71.1	----	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	62.2	71.4	70.6	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	104	107	107	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	104	104	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.2	98.2	94.1	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	104	107	107	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	104	104	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.2	98.2	94.1	----	----

Sub-Matrix: WATER			Client sample ID	Trip Blank	----	----	----	----
			Client sampling date / time	12-Dec-2018 09:00	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1864557-002	-------	-------	-------	-------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	**108**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	**105**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	**93.5**	----	----	----	----

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: 2101694)								
HK1864129-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	25.6	25.6	0.00
HK1864947-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	21.8	21.8	0.00
EG: Metals and Major Cations (QC Lot: 2092933)								
HK1863396-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	0.09	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	54.5	53.3	2.18
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.0	2.6	13.1
		EG020: Manganese	7439-96-5	0.5	mg/kg	274	283	3.11
		EG020: Tin	7440-31-5	0.5	mg/kg	4.9	4.7	4.32
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	8	8	0.00
		EG020: Copper	7440-50-8	1	mg/kg	17	17	0.00
		EG020: Lead	7439-92-1	1	mg/kg	49	43	13.8
		EG020: Molybdenum	7439-98-7	1	mg/kg	8	7	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	5	5	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	149	170	13.2
EG: Metals and Major Cations (QC Lot: 2100376)								
HK1863396-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)								
HK1864051-001	Anonymous	Naphthalene	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787) - Continued								
HK1864051-001	Anonymous	**Benzo(k)fluoranthene**	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)								
HK1863062-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)								
HK1864051-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2094013)								
HK1864557-004	S1-2 (Duplicate)	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.2	<0.2	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)								
HK1864039-011	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<2	<2	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<2	<2	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)								
HK1864039-011	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)								

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982) - Continued								
HK1864039-011	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.00

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: 2092933)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	92.6	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.5	----	85	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	87.6	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	94.1	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	90.2	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	94.2	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	98.6	----	92	115	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	86.9	----	85	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	107	----	87	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	93.2	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	91.2	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	92.6	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	111	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 2100376)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	87.5	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	68.2	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	65.4	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	72.3	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	76.1	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	87.9	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	63.8	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	89.8	----	66	111	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787) - Continued											
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	88.1	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	82.8	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	90.6	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	93.9	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	102	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	57.8	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	106	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	107	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	110	----	49	120	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	109	----	78	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.2	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	79.1	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2094013)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	115	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	82.7	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	84.1	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	86.7	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	85.3	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	85.0	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	85.2	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	85.3	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	84.3	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	86.1	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	81.9	----	81	120	----	----

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982) - Continued											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	82.4	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	83.1	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	84.1	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	83.2	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	81.3	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2088036)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	94.2	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	87.4	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	97.0	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	92.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	91.1	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	93.3	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.0	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2088036)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	87.9	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	88.7	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2088036)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	82.4	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	86.6	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	86.5	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2088036)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	96.2	----	65	130	----	----

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-074_SR-G: Trihalomethanes (THM) (QC Lot: 2088036) - Continued											
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	85.6	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2088036)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	79.5	----	67	117	----	----

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: 2092933)										
HK1863396-001	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	93.4	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	91.8	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	93.7	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	88.5	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	77.0	----	75	125	----	----
		EG020: Lead	7439-92-1	50 mg/kg	87.2	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	1 mg/kg	84.4	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	97.4	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	85.3	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	92.8	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2100376)										
HK1863396-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	89.3	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787)										
HK1864051-001	Anonymous	**Naphthalene**	91-20-3	250 µg/kg	73.5	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	72.2	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	77.0	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	74.1	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	81.7	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	83.9	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	78.0	----	50	130	----	----
		Pyrene	129-00-0	250 µg/kg	77.8	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2090787) - Continued										
HK1864051-001	Anonymous	**Benz(a)anthracene**	56-55-3	250 µg/kg	77.1	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	77.7	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	83.5	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	80.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	81.6	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	87.0	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	91.2	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	90.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2084999)										
HK1863062-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	99.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2090786)										
HK1864051-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.5	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	64.4	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2094013)										
HK1864557-004	S1-2 (Duplicate)	**C6 - C8 Fraction**	----	4.5 mg/kg	122	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	102	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	112	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	105	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	97.0	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	88.7	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	106	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	100	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2085982)										
HK1864039-012	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	107	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	114	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	105	----	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-074_SR-E: Halogenated Aliphatics (QC Lot: 2085982) - Continued										
HK1864039-012	Anonymous	**Trichloroethene**	79-01-6	0.25 mg/kg	109	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	98.8	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	109	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	92.6	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2085982)										
HK1864039-012	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	115	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-074_SR-S: 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

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 12
Contact	: MR JASON LAU	Contact	: Richard Fung	Work Order	: HK1865175
Address	: M/F GAMMON TECHNOLOGY PARK, 21 CHUN WANG STREET, TKO INDUSTRIAL ESTATE, TSEUNG KWAN O, N. T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: +852 2564 6758	Facsimile	: +852 2610 2021		
Project	: DSD CONTRACT NO. DC/2015/01 LAND CONTAMINATION TESTING IN TAI SHUI HANG, MA ON SHAN			Date Samples Received	: 14-Dec-2018
Order number	: ----	Quote number	: HKE/2925/2018	Issue Date	: 02-Jan-2019
C-O-C number	: H037695			No. of samples received	: 6
Site	: VEHICLE DETENTION CENTRE. TAI SHUI HANG			No. of samples analysed	: 6

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 14-Dec-2018 to 31-Dec-2018.

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: HK1865175

Sample(s) were received in chilled condition.

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

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

Analytical Results

Sub-Matrix: **WATER**

				Client sample ID	S2-W	S2-W-dup	S1-W	Equipment Blank	Field Blank
				Client sampling date / time	14-Dec-2018 11:00	14-Dec-2018 11:00	14-Dec-2018 11:28	14-Dec-2018 11:40	14-Dec-2018 11:40
Compound	CAS Number	LOR	Unit		HK1865175-001	HK1865175-002	HK1865175-003	HK1865175-004	HK1865175-005
EG: Metals and Major Cations - Filtered									
EG020: Antimony	7440-36-0	1	µg/L		**2**	**2**	**4**	<1	<1
EG020: Arsenic	7440-38-2	10	µg/L		<10	<10	<10	<10	<10
EG020: Barium	7440-39-3	1	µg/L		**51**	**48**	**23**	<1	<1
EG020: Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Cobalt	7440-48-4	1	µg/L		<1	<1	<1	<1	<1
EG020: Copper	7440-50-8	1	µg/L		<1	<1	**13**	<1	<1
EG020: Lead	7439-92-1	1	µg/L		<1	<1	<1	<1	<1
EG020: Manganese	7439-96-5	1	µg/L		**6**	**6**	**1**	**2**	<1
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Molybdenum	7439-98-7	1	µg/L		**205**	**204**	**137**	<1	<1
EG020: Nickel	7440-02-0	1	µg/L		<1	<1	**1**	<1	<1
EG020: Tin	7440-31-5	1	µg/L		**4**	**4**	**47**	**1**	<1
EG020: Zinc	7440-66-6	10	µg/L		<10	<10	<10	<10	<10
EG049: Trivalent Chromium	16065-83-1	20	µg/L		<20	<20	<20	<20	<20
EG050: Hexavalent Chromium	18540-29-9	20	µg/L		<20	<20	<20	<20	<20
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
EP076HK: Naphthalene	91-20-3	2.0	µg/L		<2.0	<2.0	**3.5**	<2.0	<2.0
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Acenaphthene	83-32-9	2.0	µg/L		<2.0	<2.0	**2.1**	<2.0	<2.0
EP076HK: Fluorene	86-73-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Phenanthrene	85-01-8	2.0	µg/L		<2.0	<2.0	**4.4**	<2.0	<2.0
EP076HK: Anthracene	120-12-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Fluoranthene	206-44-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Pyrene	129-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Benz(a)anthracene	56-55-3	2.0	µg/L		---	---	---	<2.0	<2.0
EP076HK: Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP076HK: Benzo(k)fluoranthene	207-08-9	2.0	µg/L		---	---	---	<2.0	<2.0
EP076HK: Benzo(a)pyrene	50-32-8	2.0	µg/L		---	---	---	<2.0	<2.0

Sub-Matrix: WATER				Client sample ID	S2-W	S2-W-dup	S1-W	Equipment Blank	Field Blank
				Client sampling date / time	14-Dec-2018 11:00	14-Dec-2018 11:00	14-Dec-2018 11:28	14-Dec-2018 11:40	14-Dec-2018 11:40
Compound	CAS Number	LOR	Unit		HK1865175-001	HK1865175-002	HK1865175-003	HK1865175-004	HK1865175-005
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L		----	----	----	<2.0	<2.0
EP076HK: Dibenz(a.h)anthracene	53-70-3	2.0	µg/L		----	----	----	<2.0	<2.0
EP076HK: Benzo(g.h.i)perylene	191-24-2	2.0	µg/L		----	----	----	<2.0	<2.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L		<20	<20	80	<20	<20
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L		800	700	1100	<500	<500
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L		2000	2000	63800	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	<5.0	64.2	<5.0	<5.0
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	<5.0	10.0	<5.0	<5.0
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	<5.0	37.9	<5.0	<5.0
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	<10	84	<10	<10
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	<5.0	41.7	<5.0	<5.0
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	<20	126	<20	<20
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		1090	1150	7540	<500	<500
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	<50	<50	<50	<50
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	<50	57	<50	<50
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	<5.0	9.0	<5.0	<5.0
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%		51.1	52.8	51.3	53.9	53.2

Sub-Matrix: WATER			Client sample ID	S2-W	S2-W-dup	S1-W	Equipment Blank	Field Blank
			Client sampling date / time	14-Dec-2018 11:00	14-Dec-2018 11:00	14-Dec-2018 11:28	14-Dec-2018 11:40	14-Dec-2018 11:40
Compound	CAS Number	LOR	Unit	HK1865175-001	HK1865175-002	HK1865175-003	HK1865175-004	HK1865175-005
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates - Continued								
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	83.5	86.6	63.6	89.9	79.2
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	108	109	109	110	109
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	104	104	105	105	105
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	93.1	93.4	93.3	94.1	93.4
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	108	109	109	110	109
EP074_SR: Toluene-D8	2037-26-5	0.1	%	104	104	105	105	105
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	93.1	93.4	93.3	94.1	93.4

Sub-Matrix: WATER			Client sample ID	Trip	---	---	---	---
			Client sampling date / time	14-Dec-2018	----	----	----	----
Compound	CAS Number	LOR	Unit	HK1865175-006	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	---	---	---	---
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	---	---	---	---
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	---	---	---	---
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	---	---	---	---
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	---	---	---	---
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	---	---	---	---
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	---	---	---	---
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	**106**	---	---	---	---
EP074_SR: Toluene-D8	2037-26-5	0.1	%	**104**	---	---	---	---
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	**92.5**	---	---	---	---

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: 2098708)								
HK1864925-002	Anonymous	**EG020: Cadmium**	7440-43-9	0.2	µg/L	<0.2	<0.2	0.00
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00
		EG020: Antimony	7440-36-0	1	µg/L	<1	<1	0.00
		EG020: Barium	7440-39-3	1	µg/L	<1	<1	0.00
		EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	0.00
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.00
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.00
		EG020: Manganese	7439-96-5	1	µg/L	<1	<1	0.00
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.00
		EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.00
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.00
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.00
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.00
EG: Metals and Major Cations - Filtered (QC Lot: 2118957)								
HK1864925-002	Anonymous	**EG050: Hexavalent Chromium**	18540-29-9	20	µg/L	<20	<20	0.00

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: 2098708)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	98.0	----	89	110	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	90.3	----	85	112	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	88.1	----	85	111	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	91.3	----	85	111	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	89.4	----	85	113	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	91.8	----	85	113	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	91.2	----	85	113	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	101	----	85	114	----	----

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: 2098708) - Continued											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	96.9	----	85	115	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	95.6	----	89	110	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	89.7	----	85	113	----	----
EG020: Tin	7440-31-5	1	µg/L	<1	100 µg/L	96.1	----	88	110	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	112	----	85	113	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2118957)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	101	----	80	106	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2095588)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	93.5	----	27	121	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	87.5	----	24	128	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	91.4	----	23	122	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	97.5	----	13	141	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	104	----	22	139	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	56.5	----	16	136	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	112	----	68	124	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	109	----	71	121	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	95.6	----	76	111	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	116	----	73	125	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	103	----	75	129	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	116	----	77	118	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	54.0	----	52	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	105	----	60	129	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	114	----	61	130	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	119	----	47	144	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2099141)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	78.2	----	27	121	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	72.9	----	24	128	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	77.0	----	23	122	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	79.3	----	13	141	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	91.0	----	22	139	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2099141) - Continued											
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	54.0	----	16	136	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	88.8	----	68	124	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	88.5	----	71	121	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	82.4	----	76	111	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	90.6	----	73	125	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	97.7	----	75	129	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	98.2	----	77	118	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	55.8	----	52	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	97.9	----	60	129	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	100	----	61	130	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	95.6	----	47	144	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2096792)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	83.0	----	69	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2099140)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	69.0	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	81.2	----	54	129	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2101385)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	114	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	93.7	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	101	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	92.9	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	89.5	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	106	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.4	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2101385)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	109	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	103	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2101385)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	94.6	----	71	135	----	----

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2101385) - Continued											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	107	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	104	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2101385)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	112	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	99.6	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2101385)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	101	----	67	117	----	----

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: 2098708)										
HK1864925-001	Anonymous	**EG020: Antimony**	7440-36-0	100 µg/L	98.4	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	90.3	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	87.3	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	92.0	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	88.9	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	91.2	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	91.9	----	75	125	----	----
		EG020: Manganese	7439-96-5	100 µg/L	109	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	91.6	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	95.8	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	88.5	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	96.9	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	91.9	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2118957)										
HK1864925-001	Anonymous	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	103	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates - Continued			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1864406
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 11-Dec-2018
Order number	:	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 20-Dec-2018
C-O-C number	: H013328			No. of samples received	: 11
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 11

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals

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. Testing period is from 11-Dec-2018 to 20-Dec-2018.

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: HK1864406

Site Name: Customs and Excise Department Shatin Vehicle Detention Centre.

Sample(s) were received in chilled condition.

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

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

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	BH1-G.W.	BH2-G.W.	BH3-G.W.	BH4-G.W.	BH5-G.W.
				Client sampling date / time	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018
					HK1864406-001	HK1864406-002	HK1864406-003	HK1864406-004	HK1864406-005
EG: Metals and Major Cations - Filtered									
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
EP076HK: Naphthalene	91-20-3	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Acenaphthene	83-32-9	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Fluorene	86-73-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Phenanthrene	85-01-8	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Anthracene	120-12-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Fluoranthene	206-44-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Pyrene	129-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
EP076HK: Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate									
EP076HK: Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L		<4.0	<4.0	<4.0	<4.0	<4.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L		**30**	<20	<20	<20	<20
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L		<500	**1300**	**1100**	**1100**	**1100**
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L		**2900**	**2600**	**2800**	**4200**	**1200**
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		**23.2**	<5.0	<5.0	<5.0	<5.0
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	<10	<10	<10	<10
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	<20	<20	<20	<20
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	<500	<500	<500	<500

Sub-Matrix: WATER				Client sample ID	BH1-G.W.	BH2-G.W.	BH3-G.W.	BH4-G.W.	BH5-G.W.
				Client sampling date / time	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018
Compound	CAS Number	LOR	Unit		HK1864406-001	HK1864406-002	HK1864406-003	HK1864406-004	HK1864406-005
EP-074_SR-B: Oxygenated Compounds - Continued									
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	246	448	<50	<50
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	<50	<50	<50	<50
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	<5.0	<5.0	5.0	<5.0
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%		54.5	53.8	66.3	50.8	58.9
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%		81.2	72.9	78.4	80.6	88.1
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%		109	107	107	107	108
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%		105	107	106	106	106
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		94.6	95.8	95.6	95.1	93.9
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		109	107	107	107	108
EP074_SR: Toluene-D8	2037-26-5	0.1	%		105	107	106	106	106
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		94.6	95.8	95.6	95.1	93.9

Sub-Matrix: WATER				Client sample ID	BH6-G.W.	BH7-G.W.	BH8-G.W.	Equipment Blank	Field Blank
				Client sampling date / time	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018
Compound	CAS Number	LOR	Unit		HK1864406-006	HK1864406-007	HK1864406-008	HK1864406-009	HK1864406-010
EG: Metals and Major Cations - Filtered									
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
EP076HK: Naphthalene	91-20-3	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Acenaphthene	83-32-9	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Fluorene	86-73-7	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Phenanthrene	85-01-8	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Anthracene	120-12-7	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Fluoranthene	206-44-0	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Pyrene	129-00-0	2.0	µg/L		---	---	---	---	<2.0
EP076HK: Chrysene	218-01-9	1.0	µg/L		---	---	---	---	<1.0
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L		---	---	---	---	<1.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate									
EP076HK: Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L		---	---	---	---	<4.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L		---	---	---	---	<20
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L		---	---	---	---	<500
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L		---	---	---	---	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		---	---	---	---	<5.0
EP074_SR: Toluene	108-88-3	5.0	µg/L		---	---	---	---	<5.0
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		---	---	---	---	<5.0
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		---	---	---	---	<10
EP074_SR: Styrene	100-42-5	5.0	µg/L		---	---	---	---	<5.0
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		---	---	---	---	<5.0
EP074_SR: Xylenes (Total)	----	20	µg/L		---	---	---	---	<20
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		---	---	---	---	<500
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		---	---	---	---	<50

Sub-Matrix: WATER				Client sample ID	BH6-G.W.	BH7-G.W.	BH8-G.W.	Equipment Blank	Field Blank
				Client sampling date / time	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018	11-Dec-2018
Compound	CAS Number	LOR	Unit		HK1864406-006	HK1864406-007	HK1864406-008	HK1864406-009	HK1864406-010
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		----	----	----	----	<50
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		----	----	----	----	<5.0
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		----	----	----	----	<5.0
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		----	----	----	----	<5.0
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		----	----	----	----	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		----	----	----	----	<5.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%		----	----	----	----	60.7
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%		----	----	----	----	81.7
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%		----	----	----	----	108
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%		----	----	----	----	105
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		----	----	----	----	93.7
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		----	----	----	----	108
EP074_SR: Toluene-D8	2037-26-5	0.1	%		----	----	----	----	105
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		----	----	----	----	93.7

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	11-Dec-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1864406-011	-------	-------	-------	-------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**106**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**105**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**94.6**	----	----	----	----

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: 2089869)								
HK1864406-002	BH2-G.W.	**EG020: Mercury**	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00

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: 2089869)											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	96.6	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2089961)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.0	----	27	121	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	51.5	----	24	128	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	52.7	----	23	122	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	60.3	----	13	141	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	68.5	----	22	139	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	68.3	----	16	136	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	91.0	----	68	124	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	91.8	----	71	121	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	----	73	125	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	85.9	----	75	129	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2089961)											
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4.0	0.5 µg/L	66.4	----	17	146	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2082461)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	101	----	69	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2089963)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	106	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	120	----	54	129	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2088036)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	94.2	----	68	126	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2088036) - Continued											
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	87.4	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	97.0	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	92.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	91.1	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	93.3	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.0	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2088036)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	87.9	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	88.7	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2088036)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	82.4	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	86.6	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	86.5	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2088036)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	96.2	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	85.6	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2088036)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	79.5	----	67	117	----	----

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: 2089869)										
HK1864406-001	BH1-G.W.	**EG020: Mercury**	7439-97-6	2 µg/L	97.0	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 8
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1863192
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 05-Dec-2018
Order number	: ----	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 14-Dec-2018
C-O-C number	: H013327			No. of samples received	: 3
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 05-Dec-2018 to 13-Dec-2018.

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: HK1863192

Site Name: Customs and Excise Department Shatin Vehicle Detention Centre.

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH6-3.0-3.45M	BH6-6.0-6.45M	----	----	----
			Client sampling date / time	05-Dec-2018	05-Dec-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1863192-001	HK1863192-002	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.9	19.4	----	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	----	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	2	3	----	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	35.2	50.2	----	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	----	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	1.8	2.1	----	----	----
EG020: Copper	7440-50-8	1	mg/kg	4	10	----	----	----
EG020: Lead	7439-92-1	1	mg/kg	30	28	----	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	191	327	----	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	<0.05	----	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	1	1	----	----	----
EG020: Nickel	7440-02-0	1	mg/kg	2	2	----	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	2.2	2.5	----	----	----
EG020: Zinc	7440-66-6	1	mg/kg	34	44	----	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	5.2	7.2	----	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	----	----	----

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	05-Dec-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1863192-003	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**105**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**104**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**94.5**	----	----	----	----

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: 2085003)								
HK1863154-011	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	21.9	21.8	0.00
EG: Metals and Major Cations (QC Lot: 2087790)								
HK1863192-002	BH6-6.0-6.45M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	50.2	49.3	1.90
		EG020: Cobalt	7440-48-4	0.5	mg/kg	2.1	2.0	0.00
		EG020: Manganese	7439-96-5	0.5	mg/kg	327	296	9.75
		EG020: Tin	7440-31-5	0.5	mg/kg	2.5	2.2	12.4
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	3	2	0.00
		EG020: Copper	7440-50-8	1	mg/kg	10	8	17.9
		EG020: Lead	7439-92-1	1	mg/kg	28	28	0.00
		EG020: Molybdenum	7439-98-7	1	mg/kg	1	1	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	44	39	12.0
EG: Metals and Major Cations (QC Lot: 2087995)								
HK1862775-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00

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: 2087790)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	90.1	----	85	115	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.0	----	85	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	89.6	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	95.9	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	90.8	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	97.2	----	89	114	----	----

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: 2087790) - Continued											
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	98.8	----	92	115	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	86.3	----	85	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	112	----	87	115	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	90.8	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	92.8	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	90.8	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	107	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 2087995)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	110	----	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
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2079435)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	105	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	107	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	98.8	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	95.8	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.6	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.7	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2079435)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	94.3	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	112	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2079435)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	95.5	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	108	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	109	----	73	119	----	----

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-074_SR-G: Trihalomethanes (THM) (QC Lot: 2079435)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	107	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	87.8	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2079435)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	98.1	----	67	117	----	----

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: 2087790)										
HK1863192-001	BH6-3.0-3.45M	**EG020: Antimony**	7440-36-0	5 mg/kg	94.9	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	95.0	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	98.5	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	94.7	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	94.3	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	85.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	97.6	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	94.4	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	94.5	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2087995)										
HK1862775-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	106	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 8
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1862969
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 04-Dec-2018
Order number	:	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 13-Dec-2018
C-O-C number	: H013326			No. of samples received	: 5
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 5

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 04-Dec-2018 to 13-Dec-2018.

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: HK1862969

Site Name: Customs and Excise Department Shatin Vehicle Detention Centre.

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH7 3.0-3.45m	BH7 6.0-6.45m	BH8 3.0-3.45m	BH8 6.0-6.45m	----
			Client sampling date / time	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	----
Compound	CAS Number	LOR	Unit	HK1862969-001	HK1862969-002	HK1862969-003	HK1862969-004	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.0	27.2	31.7	18.9	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	2	1	<1	----
EG020: Arsenic	7440-38-2	1	mg/kg	2	7	6	4	----
EG020: Barium	7440-39-3	1.0	mg/kg	40.6	49.5	48.0	45.8	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	0.2	0.3	<0.2	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	1.9	3.6	4.6	2.2	----
EG020: Copper	7440-50-8	1	mg/kg	3	45	35	11	----
EG020: Lead	7439-92-1	1	mg/kg	30	36	32	42	----
EG020: Manganese	7439-96-5	1.0	mg/kg	312	478	524	284	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.06	<0.05	0.10	----
EG020: Molybdenum	7439-98-7	1	mg/kg	2	4	11	2	----
EG020: Nickel	7440-02-0	1	mg/kg	2	4	17	4	----
EG020: Tin	7440-31-5	1.0	mg/kg	2.4	4.4	3.3	3.6	----
EG020: Zinc	7440-66-6	1	mg/kg	34	108	90	66	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	5.2	11.8	48.1	9.4	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	----

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	04-Dec-2018	----	----	----	----
Compound	CAS Number	LOR	Unit		HK1862969-005	-------	-------	-------	-------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		108	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		107	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		95.9	----	----	----	----

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: 2085002)								
HK1862775-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	14.0	13.5	3.32
HK1863154-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	12.5	12.8	2.65
EG: Metals and Major Cations (QC Lot: 2076221)								
HK1862969-002	BH7 6.0-6.45m	**EG020: Mercury**	7439-97-6	0.05	mg/kg	0.06	0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	49.5	41.5	17.5
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.6	3.7	3.47
		EG020: Manganese	7439-96-5	0.5	mg/kg	478	415	14.0
		EG020: Tin	7440-31-5	0.5	mg/kg	4.4	4.2	4.29
		EG020: Antimony	7440-36-0	1	mg/kg	2	2	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	7	7	0.00
		EG020: Copper	7440-50-8	1	mg/kg	45	44	0.00
		EG020: Lead	7439-92-1	1	mg/kg	36	29	19.3
		EG020: Molybdenum	7439-98-7	1	mg/kg	4	4	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	4	4	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	108	99	8.41
EG: Metals and Major Cations (QC Lot: 2087995)								
HK1862775-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00

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: 2076221)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	93.3	----	83	117	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	95.4	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	94.6	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	99.6	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	97.0	----	80	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
EG: Metals and Major Cations (QC Lot: 2076221) - Continued											
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	108	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	98.6	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	93.9	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	105	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	94.1	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	97.2	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	93.4	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	107	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2087995)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	110	----	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
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068525)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	106	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100.0	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	95.4	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	88.3	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	84.9	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.4	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.0	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068525)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	107	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	110	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068525)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	106	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.3	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	98.9	----	73	119	----	----

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-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068525)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	106	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	80.2	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068525)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	94.2	----	67	117	----	----

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: 2076221)										
HK1862969-001	BH7 3.0-3.45m	**EG020: Antimony**	7440-36-0	5 mg/kg	94.3	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	97.1	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	99.0	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	94.9	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	94.9	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	92.1	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	96.8	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	95.2	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	93.4	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2087995)										
HK1862775-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	106	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 16
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1862598
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 01-Dec-2018
Order number	:	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 11-Dec-2018
C-O-C number	: H013325			No. of samples received	: 3
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 01-Dec-2018 to 11-Dec-2018.

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: HK1862598

Site Name: Customs and Excise Department Shatin Vehicle Detention Centre.

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH2-3.0-3.45M	BH2-6.0-6.45M	----	----	----
			Client sampling date / time	01-Dec-2018	01-Dec-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862598-001	HK1862598-002	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.6	21.4	----	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	----	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	3	4	----	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	91.7	45.8	----	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	0.3	----	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	3.1	2.8	----	----	----
EG020: Copper	7440-50-8	1	mg/kg	4	18	----	----	----
EG020: Lead	7439-92-1	1	mg/kg	34	168	----	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	352	556	----	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.05	----	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	2	3	----	----	----
EG020: Nickel	7440-02-0	1	mg/kg	2	4	----	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	2.6	4.4	----	----	----
EG020: Zinc	7440-66-6	1	mg/kg	46	90	----	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	4.2	8.0	----	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	----	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	----	----	----

Sub-Matrix: SOIL			Client sample ID	BH2-3.0-3.45M	BH2-6.0-6.45M	----	----	----
			Client sampling date / time	01-Dec-2018	01-Dec-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862598-001	HK1862598-002	-------	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	----	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	----	----	----
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	----	----	----
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	----	----	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	----	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	----	----	----
EP-074_SR-G: Trihalomethanes (THM)								

Sub-Matrix: SOIL			Client sample ID	BH2-3.0-3.45M	BH2-6.0-6.45M	----	----	----
			Client sampling date / time	01-Dec-2018	01-Dec-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862598-001	HK1862598-002	-------	-------	-------
EP-074_SR-G: Trihalomethanes (THM) - Continued								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	73.4	72.9	----	----	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	77.6	75.3	----	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	102	104	----	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	106	----	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	102	102	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	102	104	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	106	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	102	102	----	----	----

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	01-Dec-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1862598-003	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**110**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**107**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**97.5**	----	----	----	----

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: 2077047)								
HK1862375-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	80.0	79.6	0.422
EG: Metals and Major Cations (QC Lot: 2072313)								
HK1862598-002	BH2-6.0-6.45M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	0.05	<0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.3	0.3	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	45.8	46.5	1.45
		EG020: Cobalt	7440-48-4	0.5	mg/kg	2.8	2.7	0.00
		EG020: Manganese	7439-96-5	0.5	mg/kg	556	510	8.79
		EG020: Tin	7440-31-5	0.5	mg/kg	4.4	4.8	7.87
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.00
		EG020: Copper	7440-50-8	1	mg/kg	18	19	0.00
		EG020: Lead	7439-92-1	1	mg/kg	168	154	8.76
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	3	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	4	4	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	90	94	3.61
EG: Metals and Major Cations (QC Lot: 2072318)								
HK1862482-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)								
HK1862095-001	Anonymous	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued								
HK1862095-001	Anonymous	**Benzo(a)pyrene**	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)								
HK1862095-001	Anonymous	**Bis(2-ethylhexyl)phthalate**	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)								
HK1862482-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)								
HK1862139-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)								
HK1862139-001	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	4.83	4.81	0.500
		Trichloroethene	79-01-6	0.1	mg/kg	0.4	0.4	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947) - Continued								
HK1862139-001	Anonymous	**Bromodichloromethane**	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00

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: 2072313)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	95.2	----	83	117	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.8	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	94.2	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	98.9	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	91.6	----	80	119	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	94.0	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	101	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	88.7	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	102	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	95.2	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	91.8	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	96.7	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	98.8	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2072318)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	96.7	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	87.8	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	76.3	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	79.7	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	81.4	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	95.8	----	68	106	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued											
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	75.1	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	97.9	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	97.0	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	91.3	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	97.2	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	98.6	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	106	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	73.3	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	101	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	109	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	111	----	49	120	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	62.9	----	55	120	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	81.4	----	76	107	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	130	----	94	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	88.1	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	86.3	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	92.2	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	90.8	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.9	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	89.4	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	88.5	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	102	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	93.4	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)											

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-074_SR-B: Oxygenated Compounds (QC Lot: 2068947) - Continued											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	95.8	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	106	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	97.0	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	97.6	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	101	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	98.1	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	88.7	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	79.4	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068525)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	106	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100.0	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	95.4	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	88.3	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	84.9	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.4	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.0	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068525)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	107	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	110	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068525)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	106	----	71	135	----	----

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2068525) - Continued											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.3	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	98.9	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068525)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	106	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	80.2	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068525)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	94.2	----	67	117	----	----

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: 2072313)										
HK1862598-001	BH2-3.0-3.45M	**EG020: Antimony**	7440-36-0	5 mg/kg	101	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	92.7	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	100	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	91.6	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	91.8	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	98.9	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	90.8	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	97.0	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2072318)										
HK1862482-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	92.6	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)										
HK1862095-002	Anonymous	**Naphthalene**	91-20-3	250 µg/kg	78.7	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	77.0	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	79.9	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	76.4	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	87.4	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	84.6	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	85.0	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued										
HK1862095-002	Anonymous	Pyrene	129-00-0	250 µg/kg	85.0	----	50	130	----	----
		Benz(a)anthracene	56-55-3	250 µg/kg	82.4	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	81.9	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	85.8	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	86.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	85.4	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	85.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	89.0	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	96.2	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)										
HK1862095-002	Anonymous	Phenol	108-95-2	250 µg/kg	93.0	----	50	130	----	----
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	83.1	----	50	130	----	----
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	97.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)										
HK1862482-002	Anonymous	C9 - C16 Fraction	----	31.5 mg/kg	92.3	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	119	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)										
HK1862139-001	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	101	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)										
HK1862139-001	Anonymous	Benzene	71-43-2	0.25 mg/kg	99.5	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	111	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	109	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	102	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	92.7	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	104	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	103	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)										
HK1862139-001	Anonymous	2-Propanone (Acetone)	67-64-1	2.5 mg/kg	113	----	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-074_SR-B: Oxygenated Compounds (QC Lot: 2068947) - Continued										
HK1862139-001	Anonymous	**2-Butanone (MEK)**	78-93-3	2.5 mg/kg	102	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	95.5	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	103	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	# Not Determined	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	111	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	90.4	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	85.8	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 16
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1862482
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 30-Nov-2018
Order number	: ----	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 11-Dec-2018
C-O-C number	: H013324			No. of samples received	: 3
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 30-Nov-2018 to 11-Dec-2018.

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: HK1862482

Site Name: Customs and Excise Department Shatin Vehicle Detection Centre

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH1-3.0-3.45M	BH1-6.0-6.45M	----	----	----
			Client sampling date / time	30-Nov-2018	30-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862482-001	HK1862482-002	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	17.6	15.4	----	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	2	<1	----	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	16	4	----	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	79.6	45.6	----	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	----	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	5.5	1.8	----	----	----
EG020: Copper	7440-50-8	1	mg/kg	181	11	----	----	----
EG020: Lead	7439-92-1	1	mg/kg	69	63	----	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	492	279	----	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	<0.05	----	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	9	6	----	----	----
EG020: Nickel	7440-02-0	1	mg/kg	6	4	----	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	11.0	5.2	----	----	----
EG020: Zinc	7440-66-6	1	mg/kg	236	73	----	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	15.5	9.3	----	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	----	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	----	----	----

Sub-Matrix: SOIL			Client sample ID	BH1-3.0-3.45M	BH1-6.0-6.45M	----	----	----
			Client sampling date / time	30-Nov-2018	30-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862482-001	HK1862482-002	-------	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	----	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	----	----	----
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	----	----	----
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	----	<200	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	----	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	----	----	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	----	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	----	----	----

Sub-Matrix: SOIL			Client sample ID	BH1-3.0-3.45M	BH1-6.0-6.45M	---	---	---
			Client sampling date / time	30-Nov-2018	30-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862482-001	HK1862482-002	-------	-------	-------
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	---	---	---
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	---	---	---
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	---	---	---
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	73.5	72.0	---	---	---
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	82.6	74.5	---	---	---
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	104	101	---	---	---
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	104	---	---	---
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	102	101	---	---	---
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	104	101	---	---	---
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	104	---	---	---
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	102	101	---	---	---

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	30-Nov-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1862482-003	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**107**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**106**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**94.5**	----	----	----	----

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: 2077047)								
HK1862375-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	80.0	79.6	0.422
EG: Metals and Major Cations (QC Lot: 2069035)								
HK1862375-002	Anonymous	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	20.2	23.2	13.9
		EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	<0.5	0.00
		EG020: Manganese	7439-96-5	0.5	mg/kg	85.6	86.9	1.52
		EG020: Tin	7440-31-5	0.5	mg/kg	2.0	2.4	19.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	1	1	0.00
		EG020: Copper	7440-50-8	1	mg/kg	32	31	5.01
		EG020: Lead	7439-92-1	1	mg/kg	6	6	0.00
		EG020: Molybdenum	7439-98-7	1	mg/kg	13	15	9.59
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	72	76	5.00
EG: Metals and Major Cations (QC Lot: 2072318)								
HK1862482-002	BH1-6.0-6.45M	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)								
HK1862095-001	Anonymous	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued								
HK1862095-001	Anonymous	**Benzo(a)pyrene**	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)								
HK1862095-001	Anonymous	**Bis(2-ethylhexyl)phthalate**	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)								
HK1862482-001	BH1-3.0-3.45M	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)								
HK1862139-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)								
HK1862139-001	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	4.83	4.81	0.500
		Trichloroethene	79-01-6	0.1	mg/kg	0.4	0.4	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947) - Continued								
HK1862139-001	Anonymous	**Bromodichloromethane**	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)								
HK1862139-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00

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: 2069035)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	98.0	----	83	117	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	92.5	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	95.5	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	100	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	92.1	----	80	119	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	96.4	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	102	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	90.6	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	105	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	96.8	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	91.5	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	98.0	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	98.2	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2072318)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	96.7	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	87.8	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	76.3	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	79.7	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	81.4	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	95.8	----	68	106	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued											
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	75.1	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	97.9	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	97.0	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	91.3	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	97.2	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	98.6	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	106	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	73.3	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	101	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	109	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	111	----	49	120	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	62.9	----	55	120	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	81.4	----	76	107	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	130	----	94	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	88.1	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	86.3	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	92.2	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	90.8	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.9	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	89.4	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	88.5	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	102	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	93.4	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)											

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-074_SR-B: Oxygenated Compounds (QC Lot: 2068947) - Continued											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	95.8	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	106	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	97.0	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	97.6	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	101	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	98.1	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	88.7	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	79.4	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068525)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	106	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	100.0	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	95.4	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	88.3	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	84.9	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.4	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.0	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068525)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	107	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	110	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068525)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	106	----	71	135	----	----

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2068525) - Continued											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.3	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	98.9	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068525)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	106	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	80.2	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068525)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	94.2	----	67	117	----	----

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: 2069035)										
HK1862375-001	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	102	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	98.6	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	102	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	93.3	----	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: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	97.5	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	97.7	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	90.7	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	98.9	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2072318)										
HK1862482-001	BH1-3.0-3.45M	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	92.6	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)										
HK1862095-002	Anonymous	**Naphthalene**	91-20-3	250 µg/kg	78.7	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	77.0	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	79.9	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	76.4	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	87.4	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	84.6	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	85.0	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued										
HK1862095-002	Anonymous	**Pyrene**	129-00-0	250 µg/kg	85.0	----	50	130	----	----
		Benz(a)anthracene	56-55-3	250 µg/kg	82.4	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	81.9	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	85.8	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	86.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	85.4	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	85.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	89.0	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	96.2	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)										
HK1862095-002	Anonymous	**Phenol**	108-95-2	250 µg/kg	93.0	----	50	130	----	----
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	83.1	----	50	130	----	----
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	97.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068920)										
HK1862482-002	BH1-6.0-6.45M	**C9 - C16 Fraction**	----	31.5 mg/kg	92.3	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	119	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2068946)										
HK1862139-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	101	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	99.5	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	111	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	109	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	102	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	92.7	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	104	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	103	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2068947)										
HK1862139-001	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	113	----	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-074_SR-B: Oxygenated Compounds (QC Lot: 2068947) - Continued										
HK1862139-001	Anonymous	**2-Butanone (MEK)**	78-93-3	2.5 mg/kg	102	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	95.5	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	103	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	# Not Determined	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	111	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	90.4	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2068947)										
HK1862139-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	85.8	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 20
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1862095
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 28-Nov-2018
Order number	: ----	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 10-Dec-2018
C-O-C number	: H013323			No. of samples received	: 5
Site	: CUSTOMS AND EXCISE DEPARTMENT			No. of samples analysed	: 5

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Lin Wai Yu , Iris	Assistant Manager - Inorganics	Inorganics
Wong Wing , Kenneth	Manager - Metals	Metals

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. Testing period is from 28-Nov-2018 to 07-Dec-2018.

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: HK1862095

Site Name: Customs and Excise Department Shatin Vehicle Detection Centre

Sample(s) were received in chilled condition.

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

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH4-3.0-3.45M	BH4-5.80-6.25M	----	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862095-001	HK1862095-002	-------	-------	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	19.3	23.2	----	----	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	----	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	4	7	----	----	----
EG020: Barium	7440-39-3	1.0	mg/kg	22.6	87.7	----	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	0.6	----	----	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	3.9	4.8	----	----	----
EG020: Copper	7440-50-8	1	mg/kg	6	12	----	----	----
EG020: Lead	7439-92-1	1	mg/kg	90	1420	----	----	----
EG020: Manganese	7439-96-5	1.0	mg/kg	685	3540	----	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	----	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	2	3	----	----	----
EG020: Nickel	7440-02-0	1	mg/kg	4	3	----	----	----
EG020: Tin	7440-31-5	1.0	mg/kg	11.5	2.4	----	----	----
EG020: Zinc	7440-66-6	1	mg/kg	87	165	----	----	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	8.1	6.7	----	----	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	----	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	----	----	----

Sub-Matrix: SOIL			Client sample ID	BH4-3.0-3.45M	BH4-5.80-6.25M	----	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862095-001	HK1862095-002	-------	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	----	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	----	----	----
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	----	----	----
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	----	----	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	----	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	**0.09**	<0.04	----	----	----
EP-074_SR-G: Trihalomethanes (THM)								

Sub-Matrix: SOIL			Client sample ID	BH4-3.0-3.45M	BH4-5.80-6.25M	----	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	----	----	----
Compound	CAS Number	LOR	Unit	HK1862095-001	HK1862095-002	-------	-------	-------
EP-074_SR-G: Trihalomethanes (THM) - Continued								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	72.7	68.1	----	----	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	79.5	73.6	----	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	102	----	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	104	----	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.4	101	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	102	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	104	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	99.4	101	----	----	----

Sub-Matrix: WATER			Client sample ID	Field Blank	Equipment Blank	Trip Blank	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	28-Nov-2018	----	----
Compound	CAS Number	LOR	Unit	HK1862095-003	HK1862095-004	HK1862095-005	-------	-------
EG: Metals and Major Cations - Filtered								
EG020: Antimony	7440-36-0	1	µg/L	<1	<1	----	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	----	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	<1	----	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	----	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	----	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	<1	----	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	<1	----	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	2	----	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	----	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	----	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	<1	----	----	----
EG020: Tin	7440-31-5	1	µg/L	<1	<1	----	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	----	----	----
EG049: Trivalent Chromium	16065-83-1	20	µg/L	<20	<20	----	----	----
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	----	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Acenaphthylene	208-96-8	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Acenaphthene	83-32-9	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Fluorene	86-73-7	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Phenanthrene	85-01-8	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Anthracene	120-12-7	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Fluoranthene	206-44-0	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Pyrene	129-00-0	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
EP076HK: Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
EP076HK: Benzo(k)fluoranthene	207-08-9	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0	----	----	----	----

Sub-Matrix: WATER			Client sample ID	Field Blank	Equipment Blank	Trip Blank	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	28-Nov-2018	----	----
Compound	CAS Number	LOR	Unit	HK1862095-003	HK1862095-004	HK1862095-005	-------	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0	----	----	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Phenol	108-95-2	2.0	µg/L	<2.0	----	----	----	----
EP076HK: Hexachlorobenzene (HCB)	118-74-1	4.0	µg/L	<4.0	----	----	----	----
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	20.0	µg/L	<20.0	----	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	20	µg/L	<20	----	----	----	----
EP071HK_SR: C9 - C16 Fraction	----	500	µg/L	<500	----	----	----	----
EP071HK_SR: C17 - C35 Fraction	----	500	µg/L	<500	----	----	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	----	<10	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L	<20	----	<20	----	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L	<500	----	<500	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	<50	----	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	50	µg/L	<50	----	<50	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L	<5.0	----	<5.0	----	----
EP-074_SR-G: Trihalomethanes (THM)								
EP074_SR: Chloroform	67-66-3	5.0	µg/L	<5.0	----	<5.0	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L	<5.0	----	<5.0	----	----
EP-074_SR-I: Methyl-tert-butyl Ether								

Sub-Matrix: WATER			Client sample ID	Field Blank	Equipment Blank	Trip Blank	----	----
			Client sampling date / time	28-Nov-2018	28-Nov-2018	28-Nov-2018	----	----
Compound	CAS Number	LOR	Unit	HK1862095-003	HK1862095-004	HK1862095-005	-------	-------
EP-074_SR-I: Methyl-tert-butyl Ether - Continued								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	----	<5.0	----	----
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	54.7	----	----	----	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	86.1	----	----	----	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	----	----	----	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	----	----	----	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	93.1	----	----	----	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	107	----	107	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	----	104	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	93.1	----	93.3	----	----

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: 2077046)								
HK1862004-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	53.1	52.9	0.472
HK1862004-011	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	45.6	45.6	0.00
EG: Metals and Major Cations (QC Lot: 2064695)								
HK1862095-002	BH4-5.80-6.25M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.6	0.5	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	87.7	83.2	5.32
		EG020: Cobalt	7440-48-4	0.5	mg/kg	4.8	4.6	2.51
		EG020: Manganese	7439-96-5	0.5	mg/kg	3540	3380	4.43
		EG020: Tin	7440-31-5	0.5	mg/kg	2.4	2.6	5.91
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	7	7	0.00
		EG020: Copper	7440-50-8	1	mg/kg	12	12	0.00
		EG020: Lead	7439-92-1	1	mg/kg	1420	1260	11.8
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	3	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	3	3	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	165	174	5.07
EG: Metals and Major Cations (QC Lot: 2065905)								
HK1861723-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)								
HK1862095-001	BH4-3.0-3.45M	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued								
HK1862095-001	BH4-3.0-3.45M	**Benzo(k)fluoranthene**	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)								
HK1862095-001	BH4-3.0-3.45M	**Bis(2-ethylhexyl)phthalate**	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)								
HK1860905-013	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)								
HK1860905-017	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2060539)								
HK1861647-062	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.1	<0.1	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.2	<0.2	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	<0.4	0.00
		Xylenes (Total)	----	1	mg/kg	<1.0	<1.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2060539)								
HK1861647-062	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<2	<2	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<2	<2	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2060539)								
HK1861647-062	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2060539)								

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2060539) - Continued								
HK1861647-062	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2060539)								
HK1861647-062	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.00

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: 2064697)								
HK1862095-004	Equipment Blank	**EG020: Cadmium**	7440-43-9	0.2	µg/L	<0.2	<0.2	0.00
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.00
		EG020: Antimony	7440-36-0	1	µg/L	<1	<1	0.00
		EG020: Barium	7440-39-3	1	µg/L	<1	<1	0.00
		EG020: Cobalt	7440-48-4	1	µg/L	<1	<1	0.00
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.00
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.00
		EG020: Manganese	7439-96-5	1	µg/L	2	2	0.00
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.00
		EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.00
		EG020: Tin	7440-31-5	1	µg/L	<1	<1	0.00
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.00
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.00
EG: Metals and Major Cations - Filtered (QC Lot: 2079930)								
HK1862095-004	Equipment Blank	**EG050: Hexavalent Chromium**	18540-29-9	20	µg/L	<20	<20	0.00

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: 2064695)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	96.0	----	83	117	----	----

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: 2064695) - Continued											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	92.6	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	94.4	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	99.7	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	90.6	----	80	119	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	95.1	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	101	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	88.2	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	96.9	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	96.4	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	92.1	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	97.1	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	104	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2065905)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	101	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	87.8	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	76.3	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	79.7	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	81.4	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	95.8	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	75.1	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	97.9	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	97.0	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	91.3	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	97.2	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	98.6	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	106	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	73.3	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	101	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	109	----	52	110	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued											
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	111	----	49	120	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	62.9	----	55	120	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	81.4	----	76	107	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	130	----	94	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.6	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	75.1	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	109	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2060539)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	109	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	118	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	110	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	102	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	102	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	97.7	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	100	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2060539)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	94.9	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	104	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2060539)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	99.1	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	103	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	116	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2060539)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	103	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	97.4	----	73	118	----	----

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-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2060539)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	94.9	----	74	121	----	----

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: 2064697)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	106	----	89	110	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	87.2	----	82	112	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	93.9	----	80	111	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	94.9	----	85	111	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	96.6	----	85	113	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	94.9	----	85	113	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	95.3	----	85	113	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	96.5	----	82	114	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	95.6	----	79	118	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	103	----	89	110	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	95.3	----	84	113	----	----
EG020: Tin	7440-31-5	1	µg/L	<1	100 µg/L	104	----	88	110	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	90.6	----	85	113	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2079930)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	99.2	----	80	106	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064556)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	85.0	----	27	121	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	82.8	----	24	128	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	84.0	----	23	122	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	83.1	----	13	141	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	95.2	----	22	139	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	80.4	----	16	136	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	97.4	----	68	124	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	98.8	----	71	121	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064556) - Continued											
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	96.2	----	76	111	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	----	73	125	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	99.0	----	75	129	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	101	----	77	118	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	76.5	----	52	123	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	89.1	----	60	129	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	86.7	----	61	130	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	81.1	----	47	144	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064556)											
Phenol	108-95-2	5	µg/L	<5.0	0.5 µg/L	68.4	----	0	153	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4.0	0.5 µg/L	87.6	----	17	146	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	10	µg/L	<10.0	0.5 µg/L	143	----	86	154	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2059813)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	98.2	----	69	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2064558)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	73.4	----	55	109	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	89.8	----	54	129	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2057231)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	102	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	104	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	99.5	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.2	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	105	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	111	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.2	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2057231)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	98.7	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	104	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2057231)											

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2057231) - Continued											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	104	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	94.2	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	113	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2057231)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	113	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	103	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2057231)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	87.6	----	67	117	----	----

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: 2064695)										
HK1862095-001	BH4-3.0-3.45M	**EG020: Antimony**	7440-36-0	5 mg/kg	102	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	94.4	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	84.2	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	99.3	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	91.9	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	90.4	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	79.6	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	98.4	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	92.3	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	92.1	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2065905)										
HK1861723-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	98.0	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573)										
HK1862095-002	BH4-5.80-6.25M	**Naphthalene**	91-20-3	250 µg/kg	78.7	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	77.0	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	79.9	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	76.4	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	87.4	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	84.6	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	85.0	----	50	130	----	----
		Pyrene	129-00-0	250 µg/kg	85.0	----	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 (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2064573) - Continued										
HK1862095-002	BH4-5.80-6.25M	**Benz(a)anthracene**	56-55-3	250 µg/kg	82.4	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	81.9	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	85.8	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	86.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	85.4	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	85.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	89.0	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	96.2	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2064573)										
HK1862095-002	BH4-5.80-6.25M	**Phenol**	108-95-2	250 µg/kg	93.0	----	50	130	----	----
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	83.1	----	50	130	----	----
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	97.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)										
HK1860905-014	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.4	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	95.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)										
HK1860905-014	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	100	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2060539)										
HK1861647-042	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	108	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	100	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	120	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	112	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	106	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	123	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	115	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2060539)										
HK1861647-042	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	97.8	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	93.0	----	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-074_SR-E: Halogenated Aliphatics (QC Lot: 2060539)										
HK1861647-042	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	104	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	107	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	111	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2060539)										
HK1861647-042	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	123	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	97.9	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2060539)										
HK1861647-042	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	89.3	----	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: 2064697)										
HK1862095-003	Field Blank	**EG020: Antimony**	7440-36-0	100 µg/L	105	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	88.7	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	93.1	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	95.7	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	95.2	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	95.8	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	96.3	----	75	125	----	----
		EG020: Manganese	7439-96-5	100 µg/L	94.2	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	105	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	104	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	93.2	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	104	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	91.0	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 2079930)										
HK1862095-003	Field Blank	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	97.0	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: 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	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 16
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1861723
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 26-Nov-2018
Order number	: ----	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 05-Dec-2018
C-O-C number	: H013322			No. of samples received	: 5
Site	: CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			No. of samples analysed	: 5

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Leung Chak Cheong , Mike	Senior Chemist	Metals
Lin Wai Yu , Iris	Assistant Manager - Inorganics	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 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. Testing period is from 26-Nov-2018 to 05-Dec-2018.

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: HK1861723

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL			Client sample ID	BH3-3.0-3.45M	BH3-6.0-6.45M	BH5-3.0-3.45M	BH5-6.0-6.45M	----
			Client sampling date / time	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	----
Compound	CAS Number	LOR	Unit	HK1861723-001	HK1861723-002	HK1861723-003	HK1861723-004	-------
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	15.9	16.9	16.4	17.3	----
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1	<1	----
EG020: Arsenic	7440-38-2	1	mg/kg	4	4	3	4	----
EG020: Barium	7440-39-3	1.0	mg/kg	36.6	30.2	18.5	30.5	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
EG020: Cobalt	7440-48-4	1.0	mg/kg	2.3	1.5	1.7	2.0	----
EG020: Copper	7440-50-8	1	mg/kg	15	9	15	24	----
EG020: Lead	7439-92-1	1	mg/kg	46	33	33	60	----
EG020: Manganese	7439-96-5	1.0	mg/kg	444	197	292	235	----
EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	0.05	<0.05	0.20	----
EG020: Molybdenum	7439-98-7	1	mg/kg	3	1	2	3	----
EG020: Nickel	7440-02-0	1	mg/kg	4	4	2	3	----
EG020: Tin	7440-31-5	1.0	mg/kg	5.1	3.1	4.6	3.9	----
EG020: Zinc	7440-66-6	1	mg/kg	69	62	72	76	----
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	7.5	9.6	4.5	5.2	----
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
EP076HK: Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----

Sub-Matrix: SOIL			Client sample ID	BH3-3.0-3.45M	BH3-6.0-6.45M	BH5-3.0-3.45M	BH5-6.0-6.45M	----
			Client sampling date / time	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	----
Compound	CAS Number	LOR	Unit	HK1861723-001	HK1861723-002	HK1861723-003	HK1861723-004	-------
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
EP076HK: Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg	<0.200	<0.200	<0.200	<0.200	----
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg	<5.00	<5.00	<5.00	<5.00	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	----
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	----
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
EP074_SR: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
EP074_SR: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	----
EP074_SR: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP074_SR: Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	----
EP-074_SR-B: Oxygenated Compounds								
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	<50	<50	----
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	<5	----
EP-074_SR-E: Halogenated Aliphatics								
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	<0.04	<0.04	----
EP-074_SR-G: Trihalomethanes (THM)								

Sub-Matrix: SOIL			Client sample ID	BH3-3.0-3.45M	BH3-6.0-6.45M	BH5-3.0-3.45M	BH5-6.0-6.45M	----
			Client sampling date / time	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	----
Compound	CAS Number	LOR	Unit	HK1861723-001	HK1861723-002	HK1861723-003	HK1861723-004	-------
EP-074_SR-G: Trihalomethanes (THM) - Continued								
EP074_SR: Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	<0.04	<0.04	----
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
EP-074_SR-I: Methyl-tert-butyl Ether								
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%	67.0	61.5	69.6	65.5	----
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%	65.4	61.8	69.2	66.5	----
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%	109	103	104	108	----
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%	105	107	106	105	----
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	96.7	94.8	99.1	97.6	----
EP-074_SR-S: VOC Surrogates								
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%	109	103	104	108	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%	105	107	106	105	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%	96.7	94.8	99.1	97.6	----

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	26-Nov-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1861723-005	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**109**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**103**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**93.6**	----	----	----	----

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: 2071063)								
HK1861723-001	BH3-3.0-3.45M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	15.9	15.2	4.10
HK1862506-006	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	13.2	13.1	1.22
EG: Metals and Major Cations (QC Lot: 2059377)								
HK1861723-001	BH3-3.0-3.45M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	0.07	0.07	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	36.6	32.8	11.1
		EG020: Cobalt	7440-48-4	0.5	mg/kg	2.3	2.3	0.00
		EG020: Manganese	7439-96-5	0.5	mg/kg	444	393	12.1
		EG020: Tin	7440-31-5	0.5	mg/kg	5.1	5.2	0.00
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.00
		EG020: Copper	7440-50-8	1	mg/kg	15	14	7.10
		EG020: Lead	7439-92-1	1	mg/kg	46	43	5.92
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	3	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	4	4	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	69	64	7.11
EG: Metals and Major Cations (QC Lot: 2065905)								
HK1861723-002	BH3-6.0-6.45M	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005)								
HK1860905-013	Anonymous	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Pyrene	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005) - Continued								
HK1860905-013	Anonymous	Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2054005)								
HK1860905-013	Anonymous	Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<500	<500	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	<50	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)								
HK1860905-013	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)								
HK1860905-017	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2054009)								
HK1860905-017	Anonymous	Benzene	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.2	<0.2	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2054009)								
HK1860905-017	Anonymous	2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	<2	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<2	<2	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2054009)								
HK1860905-017	Anonymous	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2054009)								

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2054009) - Continued								
HK1860905-017	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2054009)								
HK1860905-017	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.00

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: 2059377)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	95.6	----	83	117	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	91.8	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	88.4	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	96.2	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	92.4	----	80	119	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	97.1	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	99.8	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	88.6	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	101	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	97.5	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	93.9	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	94.5	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	99.4	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2065905)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	25 mg/kg	101	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	70.7	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	74.9	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	74.8	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	77.8	----	66	108	----	----

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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005) - Continued											
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	91.7	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	77.7	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	92.1	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	93.1	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	88.3	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	91.7	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	93.9	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	88.5	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	67.6	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	79.8	----	50	115	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	79.5	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	73.4	----	49	120	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2054005)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	58.5	----	55	120	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	81.4	----	76	107	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	128	----	94	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.6	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	75.1	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	109	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2054009)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	109	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	105	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	106	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	108	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	107	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	106	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	108	----	85	125	----	----

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-074_SR-B: Oxygenated Compounds (QC Lot: 2054009)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	98.2	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	104	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2054009)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	97.8	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	109	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	104	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2054009)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	105	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	95.1	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2054009)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	92.9	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2057231)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	102	----	68	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	104	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	99.5	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.2	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	105	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	111	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.2	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2057231)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	98.7	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	104	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2057231)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	104	----	71	135	----	----

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-074_SR-E: Halogenated Aliphatics (QC Lot: 2057231) - Continued											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	94.2	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	113	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2057231)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	113	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	103	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2057231)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	87.6	----	67	117	----	----

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: 2059377)										
HK1861564-001	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	100	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	96.6	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	96.5	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	88.2	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	85.2	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	92.4	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	103	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	102	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	81.1	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	95.5	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2065905)										
HK1861723-001	BH3-3.0-3.45M	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	98.0	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005)										
HK1860905-007	Anonymous	**Naphthalene**	91-20-3	250 µg/kg	80.2	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	81.0	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	83.2	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	81.5	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	87.7	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	91.4	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	84.7	----	50	130	----	----
		Pyrene	129-00-0	250 µg/kg	85.4	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2054005) - Continued										
HK1860905-007	Anonymous	**Benz(a)anthracene**	56-55-3	250 µg/kg	81.0	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	83.1	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	80.3	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	76.3	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	70.0	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	68.5	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	68.0	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	57.0	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2054005)										
HK1860905-007	Anonymous	**Phenol**	108-95-2	250 µg/kg	91.6	----	50	130	----	----
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	85.6	----	50	130	----	----
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	103	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054006)										
HK1860905-014	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.4	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	95.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2054008)										
HK1860905-014	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	100	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2054009)										
HK1860905-018	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	98.0	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	106	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	103	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	96.9	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	108	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	109	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	101	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2054009)										
HK1860905-018	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	99.0	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	102	----	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-074_SR-E: Halogenated Aliphatics (QC Lot: 2054009)										
HK1860905-018	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	91.4	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	109	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	102	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2054009)										
HK1860905-018	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	105	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	100	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2054009)										
HK1860905-018	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	90.0	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates - Continued			
4-Bromofluorobenzene	460-00-4	86	115

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 18
Contact	: MR ANTHONY HO	Contact	: Richard Fung	Work Order	: HK1860823
Address	: 2507, 25/F, ONE HARBOURFRONT, 18 TAK FUNG STREET, HUNGHOM, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: anthony.ho@erm.com	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: LAND CONTAMINATION ASSESSMENT AT CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			Date Samples Received	: 21-Nov-2018
Order number	:	Quote number	: HKE/1314a/2017 revision 2	Issue Date	: 03-Dec-2018
C-O-C number	: H013321			No. of samples received	: 11
Site	: CUSTOMS AND EXCISE DEPARTMENT SHATIN VEHICLE DETENTION CENTRE			No. of samples analysed	: 11

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh .	Senior Chemist	Organics
Chan Siu Ming , Vico	Manager - Inorganics	Inorganics
Leung Chak Cheong , Mike	Senior Chemist	Metals

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. Testing period is from 21-Nov-2018 to 30-Nov-2018.

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: HK1860823

Sample(s) were received in chilled condition.

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

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

Sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Sample(s) as received, digested by In-house method E-3060 prior to the determination of Hexavalent Chromium (Cr6+). The In-house method is developed based on USEPA method 3060A.

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH1 - 0.5M	BH2 - 0.5M	BH3 - 0.5M	BH4 - 0.5M	BH5 - 0.5M
				Client sampling date / time	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Compound	CAS Number	LOR	Unit		HK1860823-001	HK1860823-002	HK1860823-003	HK1860823-004	HK1860823-005
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		9.9	9.6	15.0	15.0	18.4
EG: Metals and Major Cations									
EG020: Antimony	7440-36-0	1	mg/kg		1	<1	<1	<1	<1
EG020: Arsenic	7440-38-2	1	mg/kg		4	5	4	3	9
EG020: Barium	7440-39-3	1.0	mg/kg		51.1	46.4	27.4	19.7	48.1
EG020: Cadmium	7440-43-9	0.2	mg/kg		0.4	<0.2	<0.2	<0.2	<0.2
EG020: Cobalt	7440-48-4	1.0	mg/kg		2.2	3.2	1.6	1.5	2.4
EG020: Copper	7440-50-8	1	mg/kg		22	14	8	7	12
EG020: Lead	7439-92-1	1	mg/kg		74	53	36	35	48
EG020: Manganese	7439-96-5	1.0	mg/kg		435	491	371	239	325
EG020: Mercury	7439-97-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	0.07
EG020: Molybdenum	7439-98-7	1	mg/kg		3	4	2	3	4
EG020: Nickel	7440-02-0	1	mg/kg		3	5	2	2	6
EG020: Tin	7440-31-5	1.0	mg/kg		6.2	5.4	5.5	5.3	6.8
EG020: Zinc	7440-66-6	1	mg/kg		103	89	74	64	168
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg		15.9	11.7	4.3	3.8	12.1
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg		1.2	<1.0	<1.0	<1.0	<1.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
EP076HK: Naphthalene	91-20-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Acenaphthylene	208-96-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Acenaphthene	83-32-9	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Fluorene	86-73-7	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Phenanthrene	85-01-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Anthracene	120-12-7	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Fluoranthene	206-44-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Pyrene	129-00-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Benz(a)anthracene	56-55-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Chrysene	218-01-9	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Benzo(b)fluoranthene	205-99-2	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500

Sub-Matrix: SOIL				Client sample ID	BH1 - 0.5M	BH2 - 0.5M	BH3 - 0.5M	BH4 - 0.5M	BH5 - 0.5M
				Client sampling date / time	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Compound	CAS Number	LOR	Unit		HK1860823-001	HK1860823-002	HK1860823-003	HK1860823-004	HK1860823-005
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
EP076HK: Benzo(k)fluoranthene	207-08-9	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Benzo(a)pyrene	50-32-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP076HK: Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate									
EP076HK: Phenol	108-95-2	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50
EP076HK: Hexachlorobenzene (HCB)	118-74-1	0.200	mg/kg		<0.200	<0.200	<0.200	<0.200	<0.200
EP076HK: Bis(2-ethylhexyl)phthalate	117-81-7	5.00	mg/kg		<5.00	<5.00	<5.00	<5.00	<5.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
EP070HK_SR: C6 - C8 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
EP071HK_SR: C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200	<200	<200
EP071HK_SR: C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP074_SR: Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074_SR: Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
EP074_SR: Styrene	100-42-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074_SR: ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074_SR: Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	50	mg/kg		<50	<50	<50	<50	<50
EP074_SR: 2-Butanone (MEK)	78-93-3	5	mg/kg		<5	<5	<5	<5	<5
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074_SR: Trichloroethene	79-01-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP074_SR: Tetrachloroethene	127-18-4	0.04	mg/kg		<0.04	<0.04	<0.04	<0.04	<0.04
EP-074_SR-G: Trihalomethanes (THM)									

Sub-Matrix: SOIL				Client sample ID	BH1 - 0.5M	BH2 - 0.5M	BH3 - 0.5M	BH4 - 0.5M	BH5 - 0.5M
				Client sampling date / time	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Compound	*CAS Number*	*LOR*	*Unit*		HK1860823-001	HK1860823-002	HK1860823-003	HK1860823-004	HK1860823-005
EP-074_SR-G: Trihalomethanes (THM) - Continued									
EP074_SR: Chloroform	67-66-3	0.04	mg/kg		<0.04	<0.04	<0.04	<0.04	<0.04
EP074_SR: Bromodichloromethane	75-27-4	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
EP076HK: 2-Fluorobiphenyl	321-60-8	0.1	%		**79.9**	**78.3**	**83.7**	**80.5**	**93.4**
EP076HK: 4-Terphenyl-d14	1718-51-0	0.1	%		**77.8**	**75.7**	**74.9**	**82.5**	**103**
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
EP070HK_SR: Dibromofluoromethane	1868-53-7	0.1	%		**102**	**103**	**107**	**107**	**102**
EP070HK_SR: Toluene-D8	2037-26-5	0.1	%		**104**	**104**	**102**	**103**	**102**
EP070HK_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**99.8**	**100**	**102**	**101**	**101**
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**102**	**103**	**107**	**107**	**102**
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**104**	**104**	**102**	**103**	**102**
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**99.8**	**100**	**102**	**101**	**101**

Sub-Matrix: SOIL			Client sample ID	BH6 - 0.5M	BH6 - 0.5M DUP	BH7 - 0.5M	BH8 - 0.5M	BH8 - 0.5M DUP
			Client sampling date / time	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Compound	CAS Number	LOR	Unit	HK1860823-006	HK1860823-007	HK1860823-008	HK1860823-009	HK1860823-010
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	11.9	13.3	13.8	7.8	7.9
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1	<1	<1
EG020: Arsenic	7440-38-2	1	mg/kg	4	4	4	5	4
EG020: Barium	7440-39-3	1.0	mg/kg	34.3	39.9	36.1	28.4	29.1
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	0.2
EG020: Cobalt	7440-48-4	1.0	mg/kg	2.2	2.3	2.3	1.6	1.7
EG020: Copper	7440-50-8	1	mg/kg	12	29	19	12	11
EG020: Lead	7439-92-1	1	mg/kg	46	51	56	42	42
EG020: Manganese	7439-96-5	1.0	mg/kg	404	412	412	317	317
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EG020: Molybdenum	7439-98-7	1	mg/kg	5	9	3	2	2
EG020: Nickel	7440-02-0	1	mg/kg	4	3	3	4	3
EG020: Tin	7440-31-5	1.0	mg/kg	5.9	7.2	5.3	5.4	5.2
EG020: Zinc	7440-66-6	1	mg/kg	70	104	82	99	101
EG049: Trivalent Chromium	16065-83-1	1.0	mg/kg	7.2	7.1	8.4	6.6	6.1
EG3060: Hexavalent Chromium	18540-29-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Sub-Matrix: WATER				Client sample ID	Trip Blank	----	----	----	----
				Client sampling date / time	21-Nov-2018	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		HK1860823-011	------	------	------	------
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
EP074_SR: Benzene	71-43-2	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Toluene	108-88-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Ethylbenzene	100-41-4	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	----	----	----	----
EP074_SR: Styrene	100-42-5	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: ortho-Xylene	95-47-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Xylenes (Total)	----	20	µg/L		<20	----	----	----	----
EP-074_SR-B: Oxygenated Compounds									
EP074_SR: 2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----	----	----
EP074_SR: 2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
EP-074_SR-E: Halogenated Aliphatics									
EP074_SR: Methylene chloride	75-09-2	50	µg/L		<50	----	----	----	----
EP074_SR: Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-G: Trihalomethanes (THM)									
EP074_SR: Chloroform	67-66-3	5.0	µg/L		<5.0	----	----	----	----
EP074_SR: Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-I: Methyl-tert-butyl Ether									
EP074_SR: Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----	----	----
EP-074_SR-S: VOC Surrogates									
EP074_SR: Dibromofluoromethane	1868-53-7	0.1	%		**108**	----	----	----	----
EP074_SR: Toluene-D8	2037-26-5	0.1	%		**104**	----	----	----	----
EP074_SR: 4-Bromofluorobenzene	460-00-4	0.1	%		**96.6**	----	----	----	----

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: 2057348)								
HK1860252-017	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	3.1	2.8	7.71
HK1860252-027	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	5.6	5.5	3.26
EA/ED: Physical and Aggregate Properties (QC Lot: 2057349)								
HK1860823-005	BH5 - 0.5M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	18.4	17.2	6.44
EA/ED: Physical and Aggregate Properties (QC Lot: 2059793)								
HK1860415-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	34.1	34.8	2.10
EG: Metals and Major Cations (QC Lot: 2051256)								
HK1860823-002	BH2 - 0.5M	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	0.05	0.00
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.00
		EG020: Barium	7440-39-3	0.5	mg/kg	46.4	47.1	1.51
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.2	2.7	15.3
		EG020: Manganese	7439-96-5	0.5	mg/kg	491	448	9.04
		EG020: Tin	7440-31-5	0.5	mg/kg	5.4	6.3	14.2
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.00
		EG020: Arsenic	7440-38-2	1	mg/kg	5	5	0.00
		EG020: Copper	7440-50-8	1	mg/kg	14	14	0.00
		EG020: Lead	7439-92-1	1	mg/kg	53	55	4.25
		EG020: Molybdenum	7439-98-7	1	mg/kg	4	3	0.00
		EG020: Nickel	7440-02-0	1	mg/kg	5	4	0.00
		EG020: Zinc	7440-66-6	1	mg/kg	89	102	13.4
EG: Metals and Major Cations (QC Lot: 2058416)								
HK1860823-002	BH2 - 0.5M	**EG3060: Hexavalent Chromium**	18540-29-9	0.5	mg/kg	<1.0	<1.0	0.00
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429)								
HK1860175-010	Anonymous	**Naphthalene**	91-20-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthylene	208-96-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Acenaphthene	83-32-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluorene	86-73-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Phenanthrene	85-01-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Anthracene	120-12-7	50	µg/kg	<0.500 mg/kg	<500	0.00
		Fluoranthene	206-44-0	50	µg/kg	<0.500 mg/kg	<500	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429) - Continued								
HK1860175-010	Anonymous	**Pyrene**	129-00-0	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benz(a)anthracene	56-55-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Chrysene	218-01-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(a)pyrene	50-32-8	50	µg/kg	<0.500 mg/kg	<500	0.00
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<0.500 mg/kg	<500	0.00
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<0.500 mg/kg	<500	0.00
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<0.500 mg/kg	<500	0.00
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2046429)								
HK1860175-010	Anonymous	**Bis(2-ethylhexyl)phthalate**	117-81-7	1000	µg/kg	<5.00 mg/kg	<5000	0.00
		Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<0.200 mg/kg	<200	0.00
		Phenol	108-95-2	500	µg/kg	<0.50 mg/kg	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046430)								
HK1860175-010	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.00
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.00
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046436)								
HK1860175-010	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2045036)								
HK1860169-020	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00
		Styrene	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2051392)								
HK1860823-002	BH2 - 0.5M	**Benzene**	71-43-2	0.1	mg/kg	<0.2	<0.2	0.00
		Toluene	108-88-3	0.2	mg/kg	<0.5	<0.5	0.00
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.5	<0.5	0.00

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2051392) - Continued								
HK1860823-002	BH2 - 0.5M	**Styrene**	100-42-5	0.2	mg/kg	<0.5	<0.5	0.00
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.5	<0.5	0.00
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<1.0	<1.0	0.00
		Xylenes (Total)	----	1	mg/kg	<2.0	<2.0	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2045036)								
HK1860169-020	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2051392)								
HK1860823-002	BH2 - 0.5M	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<50	<50	0.00
		2-Butanone (MEK)	78-93-3	2	mg/kg	<5	<5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2045036)								
HK1860169-020	Anonymous	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2051392)								
HK1860823-002	BH2 - 0.5M	**Tetrachloroethene**	127-18-4	0.04	mg/kg	<0.04	<0.04	0.00
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.00
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2045036)								
HK1860169-020	Anonymous	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2051392)								
HK1860823-002	BH2 - 0.5M	**Chloroform**	67-66-3	0.04	mg/kg	<0.04	<0.04	0.00
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2045036)								
HK1860169-020	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2051392)								
HK1860823-002	BH2 - 0.5M	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.5	<0.5	0.00

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: 2051256)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	96.6	----	83	117	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	91.2	----	80	106	----	----
EG020: Barium	7440-39-3	0.5	mg/kg	<0.5	5 mg/kg	95.0	----	80	116	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	97.8	----	87	110	----	----
EG020: Cobalt	7440-48-4	0.5	mg/kg	<0.5	5 mg/kg	97.0	----	80	119	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	101	----	89	114	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	103	----	92	117	----	----
EG020: Manganese	7439-96-5	0.5	mg/kg	<0.5	5 mg/kg	94.8	----	80	114	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	98.7	----	87	122	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	97.9	----	88	113	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	94.8	----	85	112	----	----
EG020: Tin	7440-31-5	0.5	mg/kg	<0.5	5 mg/kg	95.2	----	86	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	103	----	83	118	----	----
EG: Metals and Major Cations (QC Lot: 2058416)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	108	----	85	115	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429)											
Naphthalene	91-20-3	50	µg/kg	<50	25 µg/kg	77.2	----	59	107	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	25 µg/kg	67.6	----	51	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	25 µg/kg	73.7	----	59	106	----	----
Fluorene	86-73-7	50	µg/kg	<50	25 µg/kg	75.3	----	66	108	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	25 µg/kg	83.2	----	68	106	----	----
Anthracene	120-12-7	50	µg/kg	<50	25 µg/kg	65.5	----	46	89	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	25 µg/kg	80.3	----	66	111	----	----
Pyrene	129-00-0	50	µg/kg	<50	25 µg/kg	79.7	----	62	110	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	25 µg/kg	73.4	----	64	100	----	----
Chrysene	218-01-9	50	µg/kg	<50	25 µg/kg	78.3	----	68	109	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	25 µg/kg	84.5	----	61	109	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	25 µg/kg	83.0	----	65	113	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	25 µg/kg	60.5	----	47	87	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	25 µg/kg	88.3	----	50	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
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429) - Continued											
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	25 µg/kg	87.4	----	52	110	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	25 µg/kg	91.2	----	49	120	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2046429)											
Phenol	108-95-2	500	µg/kg	<500	25 µg/kg	55.4	----	55	120	----	----
Hexachlorobenzene (HCB)	118-74-1	50	µg/kg	<50	25 µg/kg	78.4	----	76	107	----	----
Bis(2-ethylhexyl)phthalate	117-81-7	1000	µg/kg	<1000	25 µg/kg	112	----	94	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046430)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.4	----	62	128	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	79.9	----	51	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046436)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	103	----	78	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2045036)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	102	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	109	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	104	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	106	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	100	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	104	----	85	125	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2051392)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	108	----	80	122	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	105	----	82	120	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	106	----	86	121	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.5 mg/kg	108	----	83	128	----	----
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	80	118	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	102	----	81	126	----	----
Xylenes (Total)	----	1	mg/kg	<1.0	0.75 mg/kg	106	----	85	125	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2045036)											

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-074_SR-B: Oxygenated Compounds (QC Lot: 2045036) - Continued											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	112	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	110	----	78	117	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2051392)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	100	----	76	128	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	108	----	78	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2045036)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	103	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	108	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	108	----	81	117	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2051392)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	98.4	----	81	120	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	103	----	81	114	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	108	----	81	117	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2045036)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	108	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	96.0	----	73	118	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2051392)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	108	----	75	124	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	102	----	73	118	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2045036)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	89.1	----	74	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2051392)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	90.9	----	74	121	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2049087)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	118	----	68	126	----	----

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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2049087) - Continued											
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	108	----	71	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	108	----	77	118	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	98.2	----	73	122	----	----
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	102	----	74	115	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	112	----	78	122	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	103	----	78	119	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2049087)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	99.1	----	77	131	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	111	----	66	126	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2049087)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	99.0	----	71	135	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	110	----	73	119	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	106	----	73	119	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2049087)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	113	----	65	130	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	99.6	----	59	117	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2049087)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	108	----	67	117	----	----

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: 2051256)										
HK1860823-001	BH1 - 0.5M	**EG020: Antimony**	7440-36-0	5 mg/kg	101	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	94.4	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	96.8	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	94.0	----	75	125	----	----
		EG020: Copper	7440-50-8	50 mg/kg	94.9	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	88.2	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	102	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	92.8	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	93.5	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 2058416)										
HK1860823-001	BH1 - 0.5M	**EG3060: Hexavalent Chromium**	18540-29-9	25 mg/kg	89.5	----	75	125	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429)										
HK1860175-007	Anonymous	**Naphthalene**	91-20-3	250 µg/kg	80.6	----	50	130	----	----
		Acenaphthylene	208-96-8	250 µg/kg	79.8	----	50	130	----	----
		Acenaphthene	83-32-9	250 µg/kg	81.6	----	50	130	----	----
		Fluorene	86-73-7	250 µg/kg	78.9	----	50	130	----	----
		Phenanthrene	85-01-8	250 µg/kg	85.9	----	50	130	----	----
		Anthracene	120-12-7	250 µg/kg	88.5	----	50	130	----	----
		Fluoranthene	206-44-0	250 µg/kg	79.7	----	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2046429) - Continued										
HK1860175-007	Anonymous	**Pyrene**	129-00-0	250 µg/kg	79.4	----	50	130	----	----
		Benz(a)anthracene	56-55-3	250 µg/kg	78.7	----	50	130	----	----
		Chrysene	218-01-9	250 µg/kg	78.8	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	250 µg/kg	86.2	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	250 µg/kg	79.2	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	250 µg/kg	78.4	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	250 µg/kg	76.1	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	250 µg/kg	74.1	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	250 µg/kg	69.5	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 2046429)										
HK1860175-007	Anonymous	**Phenol**	108-95-2	250 µg/kg	94.8	----	50	130	----	----
		Hexachlorobenzene (HCB)	118-74-1	250 µg/kg	79.3	----	50	130	----	----
		Bis(2-ethylhexyl)phthalate	117-81-7	250 µg/kg	115	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046430)										
HK1860175-011	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	90.9	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	75.2	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2046436)										
HK1860175-011	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	111	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2045036)										
HK1860169-022	Anonymous	**Benzene**	71-43-2	0.25 mg/kg	95.9	----	50	130	----	----
		Toluene	108-88-3	0.25 mg/kg	106	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	97.4	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	109	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	99.8	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	109	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	109	----	50	130	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2051392)										
HK1860823-003	BH3 - 0.5M	**Benzene**	71-43-2	0.25 mg/kg	103	----	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-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2051392) - Continued										
HK1860823-003	BH3 - 0.5M	**Toluene**	108-88-3	0.25 mg/kg	102	----	50	130	----	----
		Ethylbenzene	100-41-4	0.25 mg/kg	97.8	----	50	130	----	----
		meta- & para-Xylene	108-38-3 106-42-3	0.5 mg/kg	105	----	50	130	----	----
		Styrene	100-42-5	0.25 mg/kg	88.9	----	50	130	----	----
		ortho-Xylene	95-47-6	0.25 mg/kg	95.1	----	50	130	----	----
		Xylenes (Total)	----	0.75 mg/kg	102	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2045036)										
HK1860169-022	Anonymous	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	102	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	96.9	----	50	130	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 2051392)										
HK1860823-003	BH3 - 0.5M	**2-Propanone (Acetone)**	67-64-1	2.5 mg/kg	98.1	----	50	130	----	----
		2-Butanone (MEK)	78-93-3	2.5 mg/kg	97.5	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2045036)										
HK1860169-022	Anonymous	**Methylene chloride**	75-09-2	0.25 mg/kg	96.5	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	108	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	104	----	50	130	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 2051392)										
HK1860823-003	BH3 - 0.5M	**Methylene chloride**	75-09-2	0.25 mg/kg	90.7	----	50	130	----	----
		Trichloroethene	79-01-6	0.25 mg/kg	106	----	50	130	----	----
		Tetrachloroethene	127-18-4	0.25 mg/kg	100	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2045036)										
HK1860169-022	Anonymous	**Chloroform**	67-66-3	0.25 mg/kg	108	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	92.5	----	50	130	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 2051392)										
HK1860823-003	BH3 - 0.5M	**Chloroform**	67-66-3	0.25 mg/kg	105	----	50	130	----	----
		Bromodichloromethane	75-27-4	0.25 mg/kg	95.5	----	50	130	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2045036)										
HK1860169-022	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	95.6	----	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-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 2051392)										
HK1860823-003	BH3 - 0.5M	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.25 mg/kg	97.2	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: 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-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CHAIN OF CUSTODY DOCUMENTATION

H 037690

ALS Laboratory Group

CLIENT: Gammon Construction Limited
ADDRESS / OFFICE: Gammon Technology Park 21 Chun Wan Street
PROJECT MANAGER (PM): Jason Lau
PROJECT ID: J3590
SITE:
P.O. NO.: 9229 1384
RESULTS REQUIRED (Date):
QUOTE NO.:

SAMPLER:
MOBILE: 9229 1384
PHONE
EMAIL REPORT TO: Jason.lau@gammonconstruction.com
EMAIL INVOICE TO: (if different to report)

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
The CoC was received on 7 Dec, 2018 p.m. HL

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

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		Metals	VOCs	PCBs	PAH								
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
1-	S1-1	S	5-12-18	11:00	AG	2	~~Including PCBs~~	~~PAH~~										See attached list
2-	~~S2-1~~ S2-1 dup	S	"	11:05	AG	2	~~Including VOCs~~	~~PCBs~~	~~PAH~~									see attached list, strong VOC expected
3-	Trip Blanks	W	"	11:00		2		✓										

RELINQUISHED BY:

Name:	Karina Chan	Date:	5/12/2018
Of:	Cinotech	Time:	15:02
Name:	Ho King Lam Taylor	Date:	5/12/2018
Of:	Gammon	Time:	15:00

RECEIVED BY

Name:		Date:	
Of:		Time:	
Name:		Date:	5/12/2018
Of:	ALS	Time:	16:25

METHOD OF SHIPMENT

Con' Note No:
Transport Co:

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 037694

ALS Laboratory Group

CLIENT: Gammon Construction Limited	SAMPLER:
ADDRESS / OFFICE: Gammon Technology Park 21 Chun Wan Street	MOBILE: 9229 1384
PROJECT MANAGER (PM): Jason Law	PHONE
PROJECT ID: J3590	EMAIL REPORT TO:
SITE: P.O. NO.: 9229 1384	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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

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		Metals	VOCs	PCBs	PAH
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles				
1	S2-2 (1.4M-1.85M)	S	8/12	12:00	U-100	1	✓	✓	✓	✓
2	trip blank	W	8/12	12:00		2		✓		

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Colman Wong	Date: 8th Dec 2018	Name: Sajna	Date: 8 Dec 2018	Con' Note No:
Of: Cinotech	Time: 12:15	Of: ALS	Time: 12:30	
Name: Taylor Ho	Date: 8th Dec 2018	Name:	Date:	Transport Co:
Of: Gammon	Time: 12:15	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 037691

ALS Laboratory Group

CLIENT: Gammon Construction Limited	SAMPLER:
ADDRESS / OFFICE: Gammon Technology Park 21 Chun Wan Street	MOBILE: 9229 1384
PROJECT MANAGER (PM): Jason Law	PHONE
PROJECT ID: J3590	EMAIL REPORT TO: Jason.law@gammonconstruction.com
SITE: P.O. NO.: 9229 1384	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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

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		VOCs	Metal	PCRs	PAH								
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
1	Field Blank	W	10/12	15:30		5	✓	✓	✓	✓								
2	Equipment Blank	W	10/12	15:30		5	✓	✓	✓	✓								
3	Trip Blank	W	10/12	15:30		2	✓											

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Colman Wong	Date: 10 Dec 2018	Name:	Date:	Con' Note No:
Of: Cinotech	Time: 15:30	Of:	Time:	
Name: Taylor Ho	Date: 10 Dec 2018	Name:	Date: 10/12/2018	Transport Co:
Of: Gammon	Time: 15:30	Of: ALS	Time: 16:20	

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 037692

ALS Laboratory Group

CLIENT: Gammon Construction Limited	SAMPLER:
ADDRESS / OFFICE: Gammon Technology Park 21 Chun Wan Street	MOBILE: 9229 1384
PROJECT MANAGER (PM): Jason Lau	PHONE
PROJECT ID: J3590	EMAIL REPORT TO:
SITE: P.O. NO.: 9229 1384	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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE:
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	PAH	VOC	PCBs									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1.	~~SS~~S1-2	S	12-12-18	9:00	U-100	1	✓	✓	✓	✓									Produce a duplicate sample from S1-2 by mixing & spliting the sample into S1-2 & S1-2 (Duplicate)
2.	Trip Blank	W	12-12-18	9:00	AG	2			✓										
3.	S1-3	S	12-12-18	14:00	U-100	1	✓	✓	✓	✓									
4.	S1-2 (Duplicate)	S	12-12-18	9:00	U100	1	✓	✓	✓	✓									

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	Colman Wong	Date:	12-12-18	Name:		Date:		Con' Note No:
Of:	Cinotech	Time:	14:05	Of:		Time:		
Name:	Taylor Ho	Date:	12-12-18	Name:	Ka Kelsu	Date:	12-Dec-2018	Transport Co:
Of:	Gammon	Time:	14:05	Of:	ALS HK	Time:	14:45	

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 037695

ALS Laboratory Group

CLIENT: Gammon Construction Limited	SAMPLER:
ADDRESS / OFFICE: Gammon Technology Park 21 Chun Wan Street	MOBILE: 9229 1384
PROJECT MANAGER (PM): Jason Lau	PHONE
PROJECT ID: J3590	EMAIL REPORT TO: jason.lau@gammonconstruction.com
SITE: P.O. NO.: 9229 1384	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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

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	Metals	VOCs	PCBs	PAH
1	S2-W	W	14Dec	11:00		5	✓	✓	✓	✓
2	S2-W-dup	W		11:00		5	✓	✓	✓	✓
3	S1-W	W		11:28		5	✓	✓	✓	✓
4	Equipment Blank	W		11:40		5	✓	✓	✓	✓
5	Field Blank	W		11:40		5	✓	✓	✓	✓
6	Trip	W				2		✓		

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: Colman Wong	Date: 14 Dec 2018		Name:	Date:		Con' Note No:
Of: Cinotech	Time: 12:10		Of:	Time:		
Name: Taylor Ho	Date: 14 Dec 2018		Name:	Date: 14/12/2018		Transport Co:
Of: Gammon	Time: 12:10		Of: ALS	Time: 15:50		

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 013321

ALS Laboratory Group

CLIENT: ERM Hong Kong	SAMPLER: Anthony Ho
ADDRESS / OFFICE:	MOBILE: 6687 9053
PROJECT MANAGER (PM): Anthony Ho	PHONE
PROJECT ID: Site Investigation at C&ED VPC, Shatin	EMAIL REPORT TO: Anthony Ho
SITE: C&ED VPC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	PCR	VOCs	SVOCs									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	BH1 - 0.5M	S	21/11/2018		Soil	1	✓	✓	✓	✓									
2	BH2 - 0.5M	S				1	✓	✓	✓	✓									
3	BH3 - 0.5M	S				1	✓	✓	✓	✓									
4	BH4 - 0.5M	S				1	✓	✓	✓	✓									
5	BH5 - 0.5M	S				1	✓	✓	✓	✓									
6	BH6 - 0.5M	S				1	✓												
7	BH6 - 0.5M DUP	S				1	✓												
8	BH7 - 0.5M	S				1	✓												
9	BH8 - 0.5M	S				1	✓												
10	BH8 - 0.5M DUP	S				1	✓												
11	Trip Blank	W			Water	2			✓										

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	Anthony Ho	Date:	21 Nov 2018	Name:		Date:		Con' Note No:
Of:	ERM	Time:	12:30 pm	Of:		Time:		
Name:	Victor Tang	Date:	11	Name:		Date:	21/11/2018	Transport Co:
Of:	Driltech	Time:	11	Of:	ALS	Time:	14:55	

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.

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CHAIN OF CUSTODY DOCUMENTATION

H 013322

ALS Laboratory Group

CLIENT: ERM Hong Kong	SAMPLER: Anthony Ho
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): Anthony Ho	PHONE 66879053
PROJECT ID: Site Investigation at C&ED VPC, Shatin	EMAIL REPORT TO: Anthony Ho
SITE: C&ED VPC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	PCR	VOCs	SVOCs									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	BH3-3.0-3.45M	S	26/11/2018		S	1	✓	✓	✓	✓									
2	BH3-6.0-6.45M	S			Core	1	✓	✓	✓	✓									
3	BH5-3.0-3.45M	S			S	1	✓	✓	✓	✓									
4	BH5-6.0-6.45M	S			S	1	✓	✓	✓	✓									
5	Trip Blanks	W			Water	2			✓										

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Anthony Ho	Date: 26 Nov 2018	Name:	Date:	Con' Note No:
Of: ERM	Time: 16:36	Of:	Time:	
Name:	Date:	Name:	Date: 26/11/2018	Transport Co:
Of:	Time:	Of: ALS	Time: 17:15	

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.

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H 013323

ALS Laboratory Group

CLIENT: ERM Hong Kong	SAMPLER: Anthony Ho
ADDRESS / OFFICE:	MOBILE: 6687 9053
PROJECT MANAGER (PM): Anthony Ho	PHONE
PROJECT ID: Site Investigation at C&ED VDC, Shatin	EMAIL REPORT TO: Anthony Ho
SITE: C&ED VDC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION Type / Code	Total bottles	Metals	PCR	VOCs	SVOCs
1.	BH4-3.0-3.45M	S	28/11/2018		S 2011	1	✓	✓	✓	✓
	~~BH4-6.0-6.45M~~	S			S	1	✓	✓	✓	✓
2.	BH4-5.80-6.25M	Anthony								
3.	Field Blank	W			water	5	✓	✓	✓	✓
4.	Equipment Blank	W			water	2	✓			
5.	Trip Blank	W			water	2			✓	

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Anthony Ho	Date: 28 Nov 2018	Name:	Date:	Con' Note No:
Of: ERM	Time: 14:00	Of:	Time:	
Name:	Date:	Name:	Date: 28/11/2018	Transport Co:
Of:	Time:	Of: ALS	Time: 14:25	

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.

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H 013324

ALS Laboratory Group

CLIENT: ERM Hong Kong	SAMPLER: Anthony Ho
ADDRESS / OFFICE:	MOBILE: 6687 9053
PROJECT MANAGER (PM): Anthony Ho	PHONE
PROJECT ID: Site Investigation of C&ED VPC, Shatin	EMAIL REPORT TO: Anthony Ho
SITE: C&ED VDC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	PCB	VOCs	SVOCs								
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
1	BH1 - 3.0 - 3.45M	S	30/11/2018		Core	1	✓	✓	✓	✓								
2	BH1 - 6.0 - 6.45M	S			1	1	✓	✓	✓	✓								
3	Trip Blank	W			Water	2			✓									

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	Anthony Ho	Date:	30 Nov 2018	Name:		Date:		Con' Note No:
Of:	ERM	Time:	13:15	Of:		Time:		
Name:		Date:		Name:		Date:	30/11/2018	Transport Co:
Of:		Time:		Of:	ALS	Time:	14:50	

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 013325

ALS Laboratory Group

CLIENT:	ERM Hong Kong	SAMPLER:	Anthony Ho
ADDRESS / OFFICE:		MOBILE:	
PROJECT MANAGER (PM):	Anthony Ho	PHONE	66879053
PROJECT ID:	Site Investigation of C&ED VDC, Shatin	EMAIL REPORT TO:	Anthony Ho
SITE:	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
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		Metals	PCR	VOCs	SVOCs									
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1.	BH2-3.0-3.45M	S	1/12/2018		? Core	1	✓	✓	✓	✓									
2.	BH2-6.0-6.45M	S			?	1	✓	✓	✓	✓									
3.	Trip Blank	W			Water	2			✓										

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	Anthony Ho	Date:	1 Dec 2018	Name:		Date:		Con' Note No:
Of:	ERM	Time:	11:28am	Of:		Time:		
Name:		Date:		Name:		Date:	1/12/2018	Transport Co:
Of:		Time:		Of:	ALS	Time:	12:25	

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.

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CHAIN OF CUSTODY DOCUMENTATION

H 013326

ALS Laboratory Group

CLIENT:	ERM Hong Kong	SAMPLER:	Anthony Ho
ADDRESS / OFFICE:		MOBILE:	
PROJECT MANAGER (PM):	Anthony Ho	PHONE	6687 9053
PROJECT ID:	Site Investigation of C&ED VDC Shatin	EMAIL REPORT TO:	Anthony Ho
SITE:	C&ED VDC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	VOCs											
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	BH7 3.0-3.45m	S	4/12/2018		?	1	✓												
2	BH7 6.0-6.45m	S			Core	1	✓												
3	BH8 3.0-3.45m	S			?	1	✓												
4	BH8 6.0-6.45m	S			?	1	✓												
5	Trip Blank	W			Water	2		✓											

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	Anthony Ho	Date:	4 Dec 2018	Name:		Date:		Con' Note No:
Of:	ERM	Time:	14:31	Of:		Time:		
Name:		Date:		Name:		Date:	4/12/2018	Transport Co:
Of:		Time:		Of:	ALS	Time:	15:20	

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 013327

ALS Laboratory Group

CLIENT: ERM Hong Kong	SAMPLER: Anthony Ho
ADDRESS / OFFICE:	MOBILE: 6687 9053
PROJECT MANAGER (PM): Anthony Ho	PHONE
PROJECT ID: Site Investigation at C&ED VDC, Shatin	EMAIL REPORT TO: Anthony Ho
SITE: C&ED VDC Shatin 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
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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		Metals	VOCs
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles		
1.	BH6-3.0-3.45m	S	5/12/2018		? Core ?	1	✓	
2.	BH6-6.0-6.45m	S				1	✓	
3.	Trip Blank	W			Water	2		✓

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Anthony Ho	Date: 5 Dec 2018	Name:	Date:	Con' Note No:
Of: ERM	Time: 14:14	Of:	Time:	
Name:	Date:	Name:	Date: 5/12/2018	Transport Co:
Of:	Time:	Of: ALS	Time: 15:10	

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 013328

ALS Laboratory Group

CLIENT:	ERM Hong Kong	SAMPLER:	Anthony Ho
ADDRESS / OFFICE:		MOBILE:	
PROJECT MANAGER (PM):	Anthony Ho	PHONE	6687 9053
PROJECT ID:	Site Investigation at C&ED VDC Shatin	EMAIL REPORT TO:	Anthony Ho
SITE:	C&ED VDC Shatin 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

COOLER SEAL (circle appropriate)

Intact: Yes No (N/A) [N/A circled]

SAMPLE TEMPERATURE

CHILLED: (Yes) [Yes circled] No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

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

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	Metal (Hg)	TPH (PCR)	VOC	SVOC
1.	BH1 - GW.	W	11/12/2018		Water	5	✓	✓	✓	✓
2.	BH2 - GW.	W	11/12/2018		Water	5	✓	✓	✓	✓
3.	BH3 - GW.	W	11/12/2018		Water	5	✓	✓	✓	✓
4.	BH4 - GW.	W	11/12/2018		Water	5	✓	✓	✓	✓
5.	BH5 - GW.	W	11/12/2018		Water	5	✓	✓	✓	✓
6.	BH6 - GW.	W	11/12/2018		Water	2	✓			
7.	BH7 - GW.	W	11/12/2018		Water	2	✓			
8.	BH8 - GW.	W	11/12/2018		Water	2	✓			
9.	Equipment Blank	W	11/12/2018		Water	2	✓			
10.	Field Blank	W	11/12/2018		Water	4	✓	✓	✓	✓
11.	Trip Blank	W	11/12/2018		Water	2			✓	

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Anthony Ho	Date: 11 Dec 2018	Name:	Date:	Con' Note No:
Of: ERM	Time: 14:30	Of:	Time:	
Name:	Date:	Name: [signature]	Date: 11/12/2018	Transport Co:
Of:	Time:	Of: ALS	Time: 16:30	

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.

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APPENDIX F
RELEVANT IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES (EM&A)

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
	Land Contamination								
6.7.1	-	Further site walkover and/or detailed land contamination assessment will be required for sites that are inaccessible or currently in operation / yet to be constructed (i.e. existing STSTW, David Camp and part of existing Sha Tin VDC, and proposed A Kung Kok Shan Road surface magazine site within the Project boundary). The site walkover, detailed land contamination assessment and if necessary, remediation works should be carried out after decommissioning of the sites	Existing STSTW, David Camp and VDC / Construction Phase	Project Proponent / Contractor		√		√ (for existing STSTW)	Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land, Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		but prior to re-development and should include the following: • Prior to the commencement of the SI works, review the CAP to confirm whether the proposed SI works (e.g. sampling locations, testing parameters etc.) are still valid and to confirm the appropriate RBRGs land use scenario for the development; • Submit supplementary CAP(s), presenting the findings of the above review for EPD endorsement. If land contamination issues were identified within David Camp or part of existing VDC / proposed A Kung Kok Shan Road surface magazine site within the Project boundary in the further site walkover, findings of the site walkover and the proposal for SI works should also be presented in the supplementary CAP(s); • Carry out SI works according to the supplementary CAP endorsed by EPD; • Submit CAR(s), detailing findings of the SI works and nature/extent of any soil/groundwater contamination, and, if contaminated identified, RAP(s), discussing the appropriate remedial methods and mitigation							

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		measures, for the identified contamination, for EPD agreement; and • Carry out soil/groundwater remediation works according to EPD agreed RAP and submit RR(s) afterwards for EPD agreement. The remediation works and agreement of RR should be completed prior to re-development.							
6.7.2	-	If contamination were identified, mitigation measures as recommended in the RAP should be followed and should include the following: • Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils; • Supply of suitable clean backfill material (or treated soil) after excavation; • Stockpiling site(s) shall be lined with impermeable sheeting and bunded. Stockpiles shall be fully covered by impermeable sheeting to reduce dust emission. If this is not practicable due to frequent	Project Site / Construction Phase	Contractor		√		√ (for existing STS TW)	Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land, Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing of Completion of Measures	Implementation Agent	Implementation Stage [1]				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		usage, regular watering shall be applied. However, watering shall be avoided on stockpiles of contaminated soil to minimise contaminated runoff. • Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions; • Speed control for the trucks carrying contaminated materials shall be enforced; • Vehicle wheel and body washing facilities at the site's exist points shall be established and used; and • Pollution control measures for air emissions (e.g. from biopile blower and handling of cement), noise emissions (e.g. from blower or earthmoving equipment), and water discharges (e.g. runoff control from treatment facility) shall be implemented and complied with relevant regulations and guidelines.							