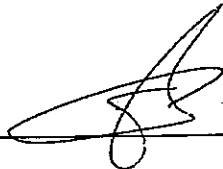


MTR Corporation Limited

West Island Line Project

Sampling and Testing Report for Works Area B

Verified by:



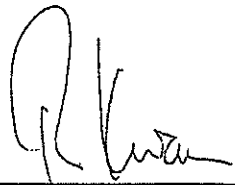
Position: Independent Environmental Checker

Date: 13 February 2015

MTR Corporation Limited

West Island Line Project

Sampling and Testing Report for Works Area B

Certified by:  _____

Position: Environmental Team Leader

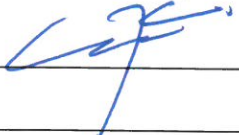
Date: 13 February 2015

Gammon Construction Limited

West Island Line (WIL) 705

Sampling and Testing Report for Works Area B

February 2015

	Name	Signature
Prepared & Checked:	Naomi Yu	
Reviewed & Approved:	Lawrence Tsui	

Version:	2	Date:	12 February 2015
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Disclaimer

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1 INTRODUCTION

1.1 Project Background

- 1.1.1 An Environmental Impact Assessment (EIA) for the Demolition of Buildings and Structures in the Proposed Kennedy Town Comprehensive Development Area site (KTCDA) was submitted under the Environmental Impact Assessment Ordinance (EIAO) in September 2001 and an Environmental Permit (EP) issued in May 2002 (EP No: EP-136/2002). In response to the changes in work areas, a revised EP (EP No: EP-136/2002/D) was issued by Environmental Protection Department (EPD) in November 2011. The revised EP allows part of the KTCDA site to be used as Works Area B (hereinafter referred as the "Site") for temporary site offices and materials storage for the West Island Line (WIL) project. The Site was originally Kennedy Town Incinerator Plant and Kennedy Town Abattoir sites with a total area of approximately 8,500m².
- 1.1.2 For the KTCDA project, it was proposed to be implemented in 2 main phases, as follows:
- Phase 1 - Part 1 would comprise the demolition and clearance of all the existing chimneys, buildings and ancillary structures above the existing concrete slab;
 - Phase 1 - Part 2 would comprise the use of the site as Works Area B as temporary site offices and material storage for the West Island Line (WIL) project; and
 - Phase 2 works would comprise the remediation of the contamination of the site in accordance with the EIA for Demolition of Buildings and Structures in the Proposed Kennedy Town Comprehensive Development Area site.
- 1.1.3 As the use of Works Area B under the WIL project has now been approaching the completion stage, under Clause 3.1.2 (b) and 3.3.2 of the EP-313/2008/J issued by EPD on 1 September 2014, a Fill Sampling and Testing Proposal (FSTP) for the general fill material, a Sampling and Testing Report (STR) and a Remediation Action Plan (RAP)(if contamination is confirmed) would need to be submitted to EPD for approval at least 4 months before commencement of removal of the additional concrete paving and the layer of general fill material without disturbing the original slab, confirming what to be tested and the locations for sampling. The proposal should be certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC) prior to issue to EPD.
- 1.1.4 AECOM Asia Co. Ltd. (AECOM) is commissioned by Gammon Construction Limited (GCL) as the environmental consultant to undertake the tasks (a) and (b) under Clause 3.3.2 of EP-313/2008 and with reference made to the document "West Island Line Consultancy Agreement No. C704 - KET Station and Overrun Tunnel, and Modification of SHW Station: Justification of Alternative Capping Slab Design for Works Area B" (hereinafter referred as the "*Justification from MTR*") is for a VEP application (VEP-333.2010).
- 1.1.5 AECOM prepared a FSTP outlining the proposed sampling locations and a testing schedule for site investigation (SI). 19 sampling locations were proposed within the Site area. The FSTP was submitted and subsequently endorsed by EPD.
- 1.1.6 The SI works were carried out on 22 and 25 October 2014. SI works including soil sampling were conducted by Gammon Construction Limited (Gammon) and supervised by AECOM. Laboratory analyses were undertaken by ALS Technichem (HK) Pty Limited (ALS). AECOM collated the SI and laboratory results in preparation of this STR.

1.2 Objectives

- 1.2.1 The objectives of this STR is to report the findings of the SI (including fieldworks and laboratory analyses) with reference to *Practice Guide for Investigation and Remediation of Contaminated Land*" (Practice Guide) issued by Environmental Protection Department (EPD).
- 1.2.2 This STR is submitted to EPD for endorsement.

2 SITE INVESTIGATION

2.1 Soil Boring and Sampling

- 2.1.1 According to the approved FSTP, a total of 19 sampling locations were proposed in the Site. The original sampling and testing plan in the approved FSTP is annexed in **Appendix A**.
- 2.1.2 The SI works were carried out on 22 and 25 October 2014. Disturbed soil samples were collected from inspection pit under supervision of AECOM.
- 2.1.3 During the SI, some sampling depths have been changed as compared to the original sampling plan stated in the FSTP due to site-specific conditions encountered. Details and reasons of these adjustments are summarized in **Table 2.1**. The as-built sampling location plans are shown in **Figure 2.1**.

Table 2.1 Changes to the Sampling Plan due to Site Constraints

Sample I.D	Changes Made	Justification
S2	Sampling at 0.2 m below concrete slab (bcs)	2 nd layer of concrete slab was encountered at 0.4m bcs.
S3	Sampling at 0.1m bcs	2 nd layer of concrete slab was encountered at 0.1m bcs.
S4	Sampling at 0.2m bcs	2 nd layer of concrete slab was encountered at 0.38m bcs.
S5	Sampling at 0.2m bcs	2 nd layer of concrete slab was encountered at 0.38m bcs.
S6	Sampling at 0.1m bcs	2 nd layer of concrete slab was encountered at 0.11m bcs.
S8	Sampling at 0.1m bcs	2 nd layer of concrete slab was encountered at 0.13m bcs.
S9	Sampling at 0.13m bcs	2 nd layer of concrete slab was encountered at 0.26m bcs.
S10	Sampling at 0.1m bcs	2 nd layer of concrete slab was encountered at 0.13m bcs.
S13	Sampling at 0.11m bcs	2 nd layer of concrete slab was encountered at 0.23m bcs.
S17	Sampling at 0.2m bcs	2 nd layer of concrete slab was encountered at 0.4m bcs.
S18	Sampling at 0.25m bcs	2 nd layer of concrete slab was encountered at 0.5m bcs.

- 2.1.4 The actual sampling matrix at each sampling location is provided in **Table 2.2**.

Table 2.2 Actual Soil Sampling Matrix

Sample Location	As Built Co-ordinates		Thickness of concrete slab (m)	Termination Depth (m)	Proposed Sampling Depth (m bcs)
	Easting	Northing			0.5
					Actual Sampling Depth (m bcs)
S1	830762.511	815994.917	0.25	0.75	0.5
S2	830798.216	815975.139	0.24	0.64	0.2
S3	830803.077	815938.428	0.23	0.33	0.1
S4	830804.514	816011.086	0.24	0.62	0.2
S5	830819.274	815977.790	0.23	0.61	0.2
S6	830834.280	815966.189	0.22	0.33	0.1
S7	830865.835	815964.184	0.35	0.85	0.5
S8	830868.808	816014.614	0.26	0.39	0.1
S9	830869.718	815998.335	0.23	0.49	0.13

S10	830911.704	816040.451	0.23	0.36	0.1
S11	830925.429	816019.236	0.52	1.2	0.5
S12	830928.997	815996.198	0.23	0.73	0.5
S13	830955.739	815998.617	0.46	0.69	0.11
S14	830952.024	816037.889	0.22	0.72	0.5
S15	830938.881	816056.346	0.24	0.74	0.5
S16	831000.104	816016.888	0.21	0.71	0.5
S17	830981.172	816035.840	0.3	0.70	0.2
S18	830984.465	816067.031	0.22	0.72	0.25
S19	830909.439	816025.205	0.51	1.1	0.5

2.1.5 Borehole logs showing the stratigraphic descriptions and depth of soil sampling are provided in **Appendix B**.

2.1.6 Minor changes to the generic sampling location stated in the FSTP were made due to the obstruction encountered at the proposed locations. Sampling locations were chosen to be representative with reference to the proposed locations and followed the grid sampling pattern. Therefore, the adjusted sampling locations are still representative for the concerned potential land contamination areas. A total of 19 soil samples (excluding samples collected for QA/QC purpose) were collected for laboratory analysis.

2.1.7 No distinctive or characteristic chemical odours were noted during advancement of inspection pit and soil sampling.

2.2 Assessment Criteria

2.2.1 The assessment methodology adopted is in accordance with the *Guidance Note for Contaminated Land Assessment and Remediation* (Guidance Note), *Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management* (Guidance Manual) and Practice Guide issued by EPD.

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

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

- Urban residential – Sites located in an urban area where main activities involve habitation by individuals. The typical physical setting is a high rise residential building situated in a housing estate that has amenity facilities such as landscaped yards and children's playgrounds. The receptors are residents who stay indoors most of the time except for a short period each day, during which they are outdoors and have the chance of being in direct contact with soil at landscaping or play areas within the estate.
- Rural residential – Sites located in a rural area where the main activities involve habitation by individuals. These sites typically have village-type houses or low rise residential blocks surrounded by open space. The receptors are rural residents who stay at home and spend some time each day outdoors on activities such as gardening or light sports. The degree of contact with the soil under the rural setting is more than that under the urban setting both in terms of the intensity and frequency of contact.
- Industrial – Any site where activities involve manufacturing, chemical or petrochemical processing, storage of raw materials, transport operations, energy production or transmission, etc. Receptors include those at sites where part of the operation is

carried out directly on land and the workers are more likely to be exposed to soil than those working in multi-storey factory buildings.

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

2.2.4 Since the future use of the fill material is unknown, therefore the most stringent criteria should be adopted. Based on *Justification from MTR*, the Rural Residential Landuse (the most stringent criteria) recommended in the Guidance Note will be adopted as the assessment criteria except two parameters Benzo(b)fluoranthene and Chrysene. Since the RBRGs (Urban Residential) for Benzo(b)fluoranthene and Chrysene are more stringent than RBRGs (Rural Residential). Therefore, RBRGs (Urban Residential) will be adopted as the acceptance level for these two parameters. Relevant soil acceptance levels are presented in **Table 2.3**.

Table 2.3 Relevant Soil Acceptance Levels

COC	Acceptance Level (mg/kg)*	COC	Acceptance Level (mg/kg)*
Metals		Additional VOCs	
Arsenic	21.8	Acetone	4,260
Barium	10,000	Bromodichloromethane	0.129
Cadmium	72.8	2-Butanone	10,000
Copper	2,910	Chloroform	0.0529
Molybdenum	364	Methyl tert-Butyl Ether	2.8
Nickel	1,460	Methylene Chloride	0.529
Zinc	10,000	Styrene	1,540
Mercury	6.52	Tetrachloroethene	0.0444
Chromium III^	10,000	Trichloroethene	0.211
Chromium VI	218	PAH***	
VOCs and SVOCs***		Acenaphthene	3,280
Naphthalene	85.6	Acenaphthylene	1,510
Anthracene	10,000	Benzo(a)anthracene	11.4
Fluoranthene	2,270	Benzo(b)fluoranthene	9.88**
Pyrene	1,710	Benzo(g,h,i)perylene	1,710
Benzo(a)pyrene	1.14	Benzo(k)fluoranthene	114
Benzene	0.279	Chrysene	871**
Toluene	705	Dibenzo(a,h)anthracene	1.14
Ethylbenzene	298	Fluorene	2,250
Xylenes (Total)	36.8	Indeno(1,2,3-cd)pyrene	11.4
PCR***		Phenanthrene	10,000
PCR C6 - C8	545		
PCR C9 - C16	1,330		
PCR C17 - C35	10,000		

Notes:

* Based on the "Rural Residential Landuse" recommended in the Risk-Based Remediation Goals promulgated in the EPD's (1) Guidance Note for Contaminated Land Assessment and Remediation, (2) Guidance Manual for Use of Risk-Based remediation Goals for Contaminated Land Management.

** "Urban Residential Landuse" is adopted.

***PCR stands for Petroleum Carbons Range; VOC stands for Volatile Organic Compounds, SVOCs stands for Semi Volatile Organic Compounds and PAH stands for Polyaromatic Hydrocarbon.

2.3 Laboratory Analytical Results

Soil Analysis

2.3.1 19 soil samples were collected during the SI and delivered to ALS for laboratory analysis. Tables of the laboratory testing result and the fill data summary are presented in **Appendix C** and the Certificates of Analysis are presented in **Appendix D**.

2.3.2 As shown in Appendix C, no soil sample analysed was found to exceed the relevant RBRGs.

QA/QC Analysis

2.3.3 QA/QC is the practice of making sure that collection and analysis techniques provide precise and accurate information. This process is to ensure the levels of contamination measured in the environmental samples reflect the actual environmental levels and are not due to accidental contamination of the sample or sample container.

2.3.4 In this SI, the following field and equipment blanks were analyzed:

- Equipment blanks – 1 equipment blank (Sample ID: Equipment Blank) was collected during soil sampling.
- Field Blanks – 1 field blank sample (Sample ID: Field Blank) was collected during soil sampling.
- Duplicate Samples – 1 soil (Sample ID: S16A (Duplicate Sample)) was collected during soil sampling.
- Trip Blanks – 1 trip blank sample (Sample ID: Trip Blank) was collected during soil sampling.

2.3.5 A summary of laboratory results for QA/QC samples are presented in **Appendix C** and the Certificates of Analysis are presented in **Appendix D**.

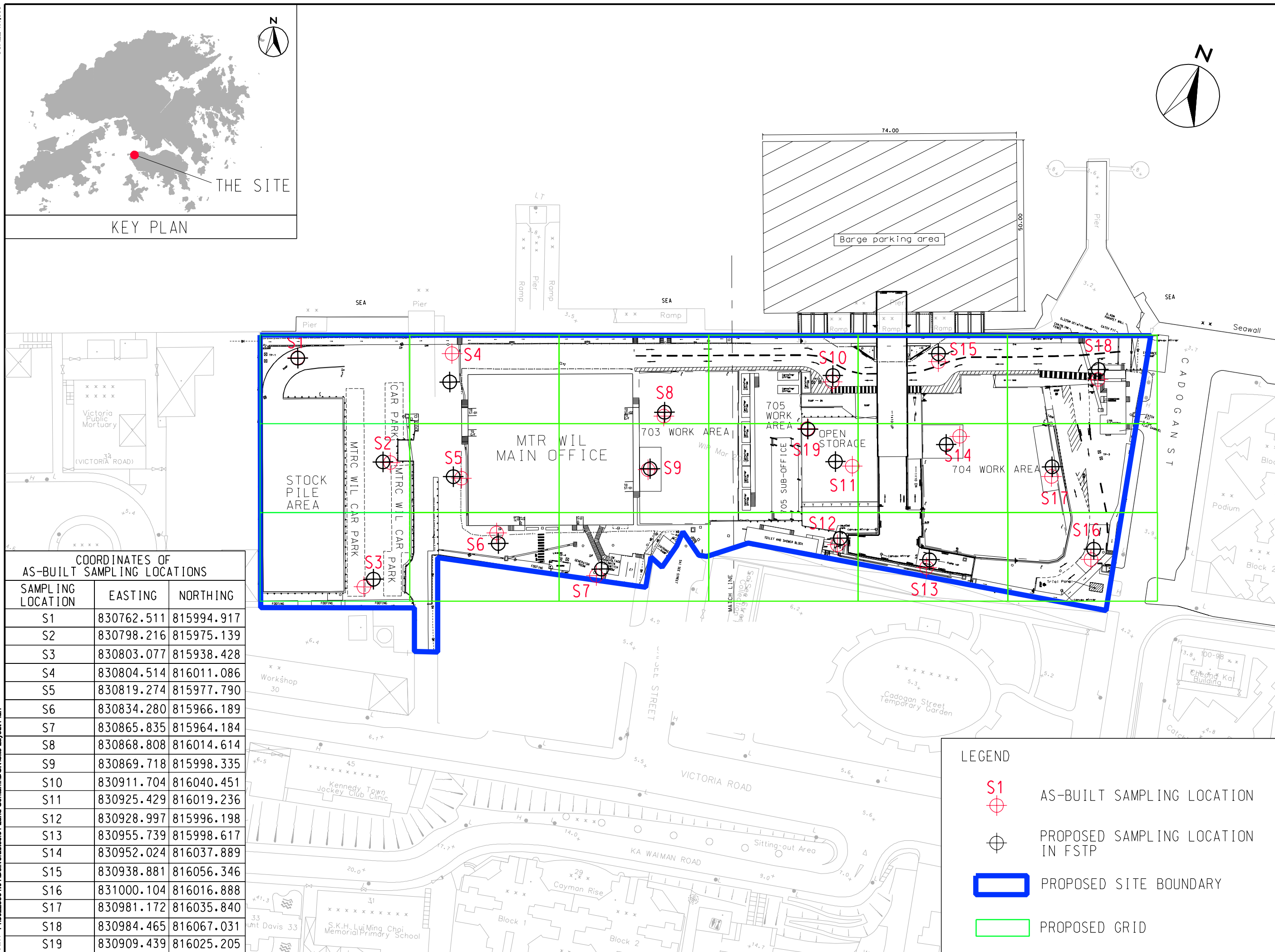
2.3.6 A low concentration of Barium and Chloroform were detected in Equipment Blank and Field Blank respectively. The readings of these parameters are very low that it does not affect the results of the SI samples.

2.3.7 A comparison of the Relative Percentage Difference (RPD) values among the duplicate samples is included in Table 3 in Appendix C. RPD of some soil Parameters were not calculated (NC) as the concentrations detected were below Level of Reporting (LOR). The soil duplicate has a RPD value of 50% in Barium. However in view of the discrepancies, it does not affect the results of soil categorization in this case.

3 CONCLUSION

- 3.1.1 SI works were conducted following the FSTP. A total of 19 soil samples were analysed for a selected suite of chemicals of potential concern.
- 3.1.2 Based on the analytical results and on site observation, no exceedances of the applicable RBRGs were detected in all 19 collected soil samples. The field assessment indicated no trace NAPL found and hence remediation action for the fill material is not required with reference to the Guidance Manual.

Figures



Appendix A

**Sampling and Testing Layout Plan Proposed in the approved
FSTP**

Table 2.2 Fill Sampling Plan for Site

Proposed Sampling Location ¹	Sampling Method	Tentative Coordinates		Sample Matrix ²		Parameters to be Tested ³				
		Easting	Northing			PCR	VOC ⁴	SVOC ⁴	PAH ⁴	Metals ⁴
S1	Trial pit	830762.50	815994.93	Soil	0.5m below concrete slab (bcs)	X	X	X		X
S2	Trial pit	830795.75	815974.30	Soil	0.5m bcs	X	X	X		X
S3	Trial pit	830804.13	815941.05	Soil	0.5m bcs	X	X	X		X
S4	Trial pit	830806.88	816002.72	Soil	0.5m bcs	X	X	X		X
S5	Trial pit	830816.50	815976.97	Soil	0.5m bcs	X	X	X		X
S6	Trial pit	830835.45	815962.71	Soil	0.5m bcs	X	X	X		X
S7	Trial pit	830865.64	815964.54	Soil	0.5m bcs	X	X	X		X
S8	Trial pit	830868.77	816014.48	Soil	0.5m bcs	X	X	X		X
S9	Trial pit	830869.58	815998.39	Soil	0.5m bcs	X	X	X	X	X
S10	Trial pit	830911.76	816040.43	Soil	0.5m bcs	X	X	X		X
S11	Trial pit	830920.22	816018.34	Soil	0.5m bcs	X	X	X		X
S12	Trial pit	830929.07	815996.21	Soil	0.5m bcs	X	X	X		X
S13	Trial pit	830955.71	815998.67	Soil	0.5m bcs	X	X	X		X
S14	Trial pit	830948.21	816033.62	Soil	0.5m bcs	X	X	X		X
S15	Trial pit	830938.84	816056.37	Soil	0.5m bcs	X	X	X		X
S16	Trial pit	831000.11	816016.89	Soil	0.5m bcs	X	X	X		X
S17	Trial pit	830980.87	816035.73	Soil	0.5m bcs	X	X	X		X
S18	Trial pit	830984.46	816067.03	Soil	0.5m bcs	X	X	X		X
S19	Trial pit	830909.41	816025.16	Soil	0.5m bcs	X	X ⁷	X		X
QA/QC Samples				Sample Matrix		Parameters to be Tested ³				
						PCR	VOC ⁴	SVOC ⁴	PAH ⁴	Metals ⁴
<i>Duplicate sample</i>				Soil	N/A	X	X	X		X
<i>Equipment blank</i>				Water	N/A	X	X	X		X
<i>Field blank</i>				Water	N/A	X	X	X		X
<i>Trip blank</i>				Water	N/A	X ⁶	X ⁶	N/A		N/A

Remarks:

1. Please refer to **Figure 1** for locations.
2. The exact sampling depth shall be determined on-site
3. X = testing proposed
4. Full list refers to the parameters as shown in **Table 3.1** and **Table 4.1**.
5. PCR stands for Petroleum Carbons Range; VOC stands for Volatile Organic Compounds and SVOCs stands for Semi Volatile Organic Compounds.
6. For Trip Blank, only C6-C8, Benzene, Toluene, Ethylbenzene and Xylenes (total) are needed to be tested.
7. Additional VOC parameters need to be included for S19. Full list of additional parameters are shown in **Table 3.1** and **Table 4.1**.

Appendix B
Soil Boring Logs

Soil boring log



Job No.: <u>60223504 2.ENV</u>	Completion Date : <u>22 Oct 2014</u>	Boring Log No. : <u>S1</u>
Site ID : <u>WIL 705 Works Area B</u>	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : <u>Provided by AECOM</u>
Ground Level: <u>5.27 mPD</u>	Co-ordinates: <u>E 830762.511 N 815994.917</u>	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S1 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
	0.80					
	0.85					
	0.90					
	1.00					
	1.50					

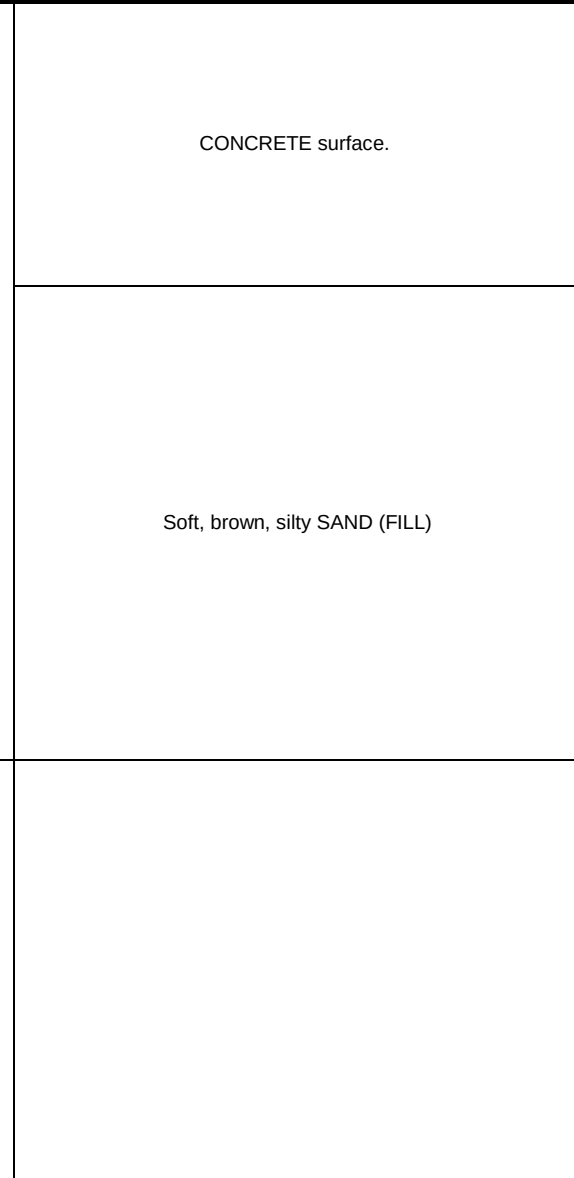
End of inspection pit = 0.75 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose	Soil bore Diameter : - Total Depth : <u>0.75 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S2
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.17 mPD	Co-ordinates: E 830798.216 N 815975.139	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S2 - 0.2 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
0.55						
0.60						
0.65						
0.70						
0.75						
0.80						
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.64 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.2m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.64 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.64 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S3
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.33 mPD	Co-ordinates: E 830803.077 N 815938.428	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S3 - 0.1 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
		1.00				
		1.50				

End of inspection pit = 0.33 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.1m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.33 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.33 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S4
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 4.39 mPD	Co-ordinates: E 830804.514 N 816011.086	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram		
22 Oct 2014	S4 - 0.2 bcs	0.05		Inspection Pit	CONCRETE surface.			
		0.10						
		0.15						
		0.20						
		0.25						
		0.30						
		0.35						
		0.40						
		0.45						
		0.50						
		0.55						
		0.60						
				0.65				
				0.70				
				0.75				
				0.80				
				0.85				
				0.90				
1.00								
1.50								

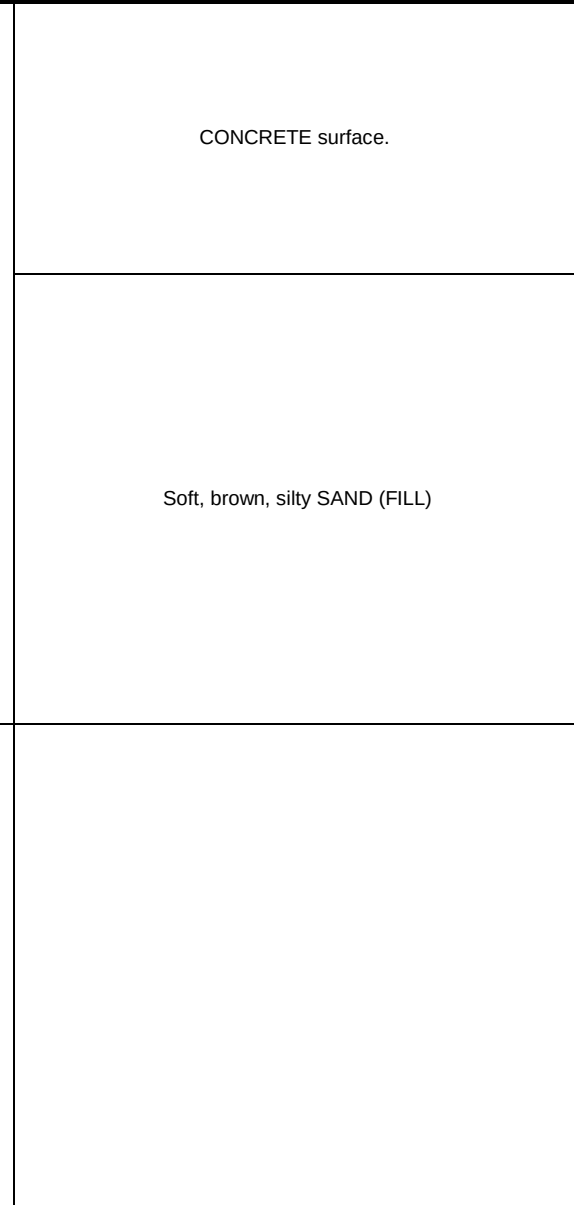
End of inspection pit = 0.62 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.2m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.62 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.62 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S5
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.02 mPD	Co-ordinates: E 830819.274 N 815977.790	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S5 - 0.2 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
0.55						
0.60						
0.65						
0.70						
0.75						
0.80						
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.61 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.2m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.61 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.61 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S6
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.27 mPD	Co-ordinates: E 830834.280 N 815966.189	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S6 - 0.1 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
		1.00				
		1.50				

End of inspection pit = 0.33 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.1m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.33 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.33 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Job No.: 60223504 2.ENV

Site ID : WIL 705 Works Area B

Ground Level: 5.735 mPD

Completion Date : 22 Oct 2014

Location : Kennedy Town Ex-Abattoir and Incinerator Area

Co-ordinates: E 830865.835 N 815964.184

Boring Log No. : S7

Logger : Provided by AECOM

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S7 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
		0.35				
		0.40			Soft, brown, silty SAND (FILL)	
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
		1.00				
		1.50				

End of inspection pit = 0.85 m						
Remarks :			Boring Details		Well Installation Details	
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose			Soil bore Diameter : - Total Depth : 0.85 m Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -		Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -	

Soil boring log



Job No.: 60223504 2 ENV	Completion Date : 22 Oct 2014	Boring Log No. : S8
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.26 mPD	Co-ordinates: E 830868.808 N 816014.614	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram	
22 Oct 2014	S8 - 0.1 bcs	0.05		Inspection Pit	CONCRETE surface.		
		0.10					
		0.15					
		0.20					
		0.25					
0.30		Soft, brown, silty SAND (FILL)					
0.35							
0.40							
0.45							
0.50							
		0.55					
		0.60					
		0.65					
		0.70					
		0.75					
	0.80						
	0.85						
	0.90						
	1.00						
	1.50						

End of inspection pit = 0.39 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.1m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.39 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.39 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S9
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.29 mPD	Co-ordinates: E 830869.718 N 815998.335	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S9 - 0.13 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
		1.00				
		1.50				

End of inspection pit = 0.49 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.13m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.49 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.49 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 25 Oct 2014	Boring Log No. : S10
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 4.485 mPD	Co-ordinates: E 830911.704 N 816040.451	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S10 - 0.1 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
0.35		X		Soft, brown, silty SAND (FILL)		
0.40						
0.45						
0.50						
0.55						
0.60						
0.65						
0.70						
0.75						
0.80						
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.36m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.1m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.36 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.36m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 25 Oct 2014	Boring Log No. : S11
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.57mPD	Co-ordinates: E 830925.429 N 816019.236	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S11 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
		0.35				
		0.40				
		0.45				
		0.50				
		0.55			Soft, brown, silty SAND (FILL)	
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
		1.00				
		1.50				

End of inspection pit = 1.2m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose	Soil bore Diameter : - Total Depth : <u>1.2m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Job No.: 60223504 2.ENV

Site ID : WIL 705 Works Area B

Ground Level: 4.78 mPD

Completion Date : 22 Oct 2014

Location : Kennedy Town Ex-Abattoir and Incinerator Area

Co-ordinates: E 830928.997 N 815996.198

Boring Log No. : S12

Logger : Provided by AECOM

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S12 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.73 m						
Remarks :			Boring Details		Well Installation Details	
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose			Soil bore Diameter : - Total Depth : 0.73 m Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -		Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -	

Soil boring log



Job No.: 60223504 2 ENV	Completion Date : 22 Oct 2014	Boring Log No. : S13
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 4.68 mPD	Co-ordinates: E 830955.739 N 815998.617	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S13 - 0.11 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
		0.35				
		0.40				
		0.45				
		0.50			Soft, brown, silty SAND (FILL)	
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
0.80						
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.69 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.11m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.69 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.69 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.:	60223504 2.ENV	Completion Date :	25 Oct 2014	Boring Log No. :	S14	
Site ID :	WIL 705 Works Area B	Location :	Kennedy Town Ex-Abattoir and Incinerator Area	Logger :	Provided by AECOM	
Ground Level:	5.285 mPD	Co-ordinates:	E 830952.024 N 816037.889			
Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S14 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
0.75						
0.80						
0.85						
0.90						
1.00						
1.50						
End of inspection pit = 0.72m						
Remarks :					Boring Details	
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose					Well Installation Details	
					Soil bore Diameter : - Total Depth : 0.72m Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	
					Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -	

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 25 Oct 2014	Boring Log No. : S15
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 4.37 mPD	Co-ordinates: E 830938.881 N 816056.346	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S15 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
	0.80					
	0.85					
	0.90					
	1.00					
	1.50					

End of inspection pit = 0.74m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose	Soil bore Diameter : - Total Depth : <u>0.74m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S16
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.12 mPD	Co-ordinates: E 831000.104 N 816016.888	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S16 - 0.5 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
0.75						
0.80						
0.85						
0.90						
1.00						
1.50						

End of inspection pit = 0.71 m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose 2) Duplicate soil sample was taken.	Soil bore Diameter : - Total Depth : <u>0.71 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 22 Oct 2014	Boring Log No. : S17
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.225 mPD	Co-ordinates: E 830981.172 N 816035.840	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
22 Oct 2014	S17 - 0.2 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30				
		0.35			Soft, brown, silty SAND (FILL)	
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
0.90						
1.00						
1.50						

End of inspection pit = 0.7m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.2m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.7 m because of 2nd layer concrete slab encountered.	Soil bore Diameter : - Total Depth : <u>0.7 m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Job No.: 60223504 2.ENV	Completion Date : 25 Oct 2014	Boring Log No. : S18
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 4.40 mPD	Co-ordinates: E 830984.465 N 816067.031	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S18 - 0.25 bcs	0.05		Inspection Pit	CONCRETE surface.	
		0.10				
		0.15				
		0.20				
		0.25				
		0.30			Soft, brown, silty SAND (FILL)	
		0.35				
		0.40				
		0.45				
		0.50				
		0.55				
		0.60				
		0.65				
		0.70				
		0.75				
		0.80				
		0.85				
		0.90				
1.00						
1.50						

End of inspection pit = 0.72m

Remarks : 1) Soil sample at 0.25m bcs was taken to laboratory for testing purpose 2) Inspection pit was terminated at 0.72 m because of 2nd layer concrete slab encountered.	Boring Details Soil bore Diameter : - Total Depth : <u>0.72m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Installation Details Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -
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Soil boring log



Job No.: 60223504 2.ENV	Completion Date : 25 Oct 2014	Boring Log No. : S19
Site ID : WIL 705 Works Area B	Location : Kennedy Town Ex-Abattoir and Incinerator Area	Logger : Provided by AECOM
Ground Level: 5.57mPD	Co-ordinates: E 830909.439 N 816025.205	

Time (hrs)	Soil Sample I.D.	Depth (m)	Sample	Method	Description of Material	Well Diagram
25 Oct 2014	S19 - 0.5 bcs	0.05	<			

End of inspection pit = 1.1m

Remarks :	Boring Details	Well Installation Details
1) Soil sample at 0.5m bcs was taken to laboratory for testing purpose	Soil bore Diameter : - Total Depth : <u>1.1m</u> Soil bore Converted to: - Dry Auger: - Wet Auger: - Water First Noticed: -	Well Diameter: - Total Depth: - Screen: - Sand Pack: - Bentonite Seal: - Grout: - Ground Completion : -

Appendix C

Summary Analytical Results for Fill

Appendix C Summary of Analytical Results for Fill

Table 1 Laboratory results for Fill

Parameters			VOCs															SVOCs & PAH															Metals										Petroleum Carbon Ranges					
			Benzene	Ethylbenzene	Toluene	meta- & para-Xylene	ortho-Xylene	Xylenes (Total)	Acetone	Bromodichloromethane	2-Butanone	Chloroform	Methyl tert-Butyl Ether	Methylene Chloride	Styrene	Tetrachloroethene	Trichloroethene	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	Pyrene	Arsenic	Barium	Cadmium	Trivalent Chromium	Hexavalent Chromium	Copper	Mercury	Molybdenum	Nickel	Zinc	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction		
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
LOR			0.2	0.5	0.5	1	0.5	2	50	0.1	5	0.04	0.5	0.5	0.5	0.04	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.2	1	1	1	0.05	1	1	1	5	200	500
Most Stringent RBRGs			0.279	298	705	--	--	36.8	4260	0.129	10000*	0.053	2.8	0.529	1540	0.044	0.211	3280	1510	10000*	11.4	1.14	9.88	1710	114	871	1.14	2270	2250	11.4	85.6	10000*	1710	21.8	10000*	72.8	10000*	218	2910	6.52	364	1460	10000*	545	1330	10000*		
Saturation Limit			336	138	235	--	--	150	***	1030	***	1100	2380	921	497	97.1	488	60.2	19.8	2.56	--	--	--	--	--	--	--	--	54.7	--	125	28	--	--	--	--	--	--	--	--	--	--	--	--	--	1000	3000	5000
Sample Location	Sampling Depth (m bcs)	Date of Sampling																																														
S1	0.50	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500		<0.500	2	4	<0.2	3	<1	1	<0.05	1	<1	28	<5	<200	<500
S2	0.20	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	4	<0.2	1	<1	1	<0.05	<1	<1	27	<5	<200	<500		
S3	0.10	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	3	32	<0.2	8	<1	8	<0.05	<1	5	31	<5	<200	<500		
S4	0.20	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	1	<1	1	<0.05	<1	<1	22	<5	<200	<500		
S5	0.20	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	1	11	<0.2	2	<1	4	<0.05	<1	1	32	<5	<200	<500		
S6	0.10	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	8	<0.2	2	<1	2	<0.05	<1	<1	46	<5	<200	<500		
S7	0.50	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	6	<0.2	1	<1	1	<0.05	<1	<1	30	<5	<200	<500		
S8	0.10	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	1	8	<0.2	4	<1	3	<0.05	<1	1	28	<5	<200	<500		
S9	0.13	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0									<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<1	6	<0.2	2	<1	1	<0.05	<1	1	29	<5	<200	<500			
S10	0.10	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	7	<0.2	2	<1	3	<0.05	<1	<1	53	<5	<200	<500		
S11	0.50	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	4	<0.2	2	<1	1	<0.05	1	<1	44	<5	<200	<500		
S12	0.50	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	5	<0.2	2	<1	1	<0.05	<1	<1	25	<5	<200	<500		
S13	0.11	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	2	<1	1	<0.05	<1	<1	33	<5	<200	<500		
S14	0.50	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	4	<0.2	2	<1	<1	<0.05	<1	<1	33	<5	<200	<500		
S15	0.50	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	2	<1	<1	<0.05	<1	<1	31	<5	<200	<500		
S16	0.50	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	2	<1	2	<0.05	<1	<1	23	<5	<200	<500		
S17	0.20	22-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	<1	<1	1	<0.05	<1	<1	26	<5	<200	<500		
S18	0.25	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0												<0.500		<0.500						<0.500			<0.500		<0.500	<1	6	<0.2	2	<1	1	<0.05	<1	<1	37	<5	<200	<500		
S19	0.50	25-Oct-14	<0.2	<0.5	<0.5	<1.0	<0.5	<2.0	<50	<0.1	<5	<0.04	<0.5	<0.5	<0.5	<0.04	<0.1			<0.500		<0.500						<0.500			<0.500		<0.500	<1	3	<0.2	1	<1	<1	<0.05	1	<1	44	<5	<200	<500		

Note:

bcs= Below Base of Existing Concrete

LOR= Level of Reporting

Full analytical results should be referred to laboratory report

Appendix C Summary of Analytical Results for Fill

Table 2 Laboratory results for QA/QC

Parameters		VOCs														SVOC					Metals										Petroleum Carbon Ranges			
		Benzene	Ethylbenzene	Toluene	meta- & para-Xylene	ortho-Xylene	Xylenes (Total)	Acetone	Bromodichloromethane	2-Butanone	Chloroform	Methyl tert-Butyl Ether	Methylene Chloride	Styrene	Tetrachloroethene	Trichloroethene	Anthracene	Benzo(a)pyrene	Fluoranthene	Naphthalene	Pyrene	Arsenic	Barium	Cadmium	Trivalent Chromium	Hexavalent Chromium	Copper	Mercury	Molybdenum	Nickel	Zinc	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
Unit		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
LOR		5	5	5	10	5	20	500	5	50	5	5	50	5	5	5	2	0.2	2	2	2	10	1	0.2	20	20	1	0.5	1	1	10	20	500	500
Sample ID	Date of Sampling																																	
FIELD BLANK	22/10/2014	<5.0	<5.0	<5.0	<10.0	<5.0	<20	<500	<5.0	<50	6.3	<5.0	<50	<5.0	<5.0	<5.0	<2.0	<0.2	<2.0	<2.0	<2.0	<10	<1	<0.2	<20	<20	<1	<0.5	<1	<1	<10	<20	<500	<500
EQUIPMENT BLANK	22/10/2014	<5.0	<5.0	<5.0	<10.0	<5.0	<20										<2.0	<0.2	<2.0	<2.0	<2.0	<10	8	<0.2	<20	<20	<1	<0.5	<1	<1	<10	<20	<500	<500
TRIP BLANK	22/10/2014	<5.0	<5.0	<5.0	<10.0	<5.0	<20																								<20			

Full analytical results should be referred to laboratory report

Appendix D
Laboratory Test Certificates

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 17
Contact	: MS MICHELLE TANG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1434707
Address	: 28/F., DEVON HOUSE, TAIKOO PLACE, 979 KING'S ROAD, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: michelle.tang@gammonconstruction.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: WIL 705	Quote number	: ----	Date Samples Received	: 22-OCT-2014
Order number	: 1390891OP			Issue Date	: 07-NOV-2014
C-O-C number	: ----			No. of samples received	: 17
Site	: KENNEDY TOWN SITE OFFICE			No. of samples analysed	: 17

This report may not be reproduced except with prior written approval from the testing laboratory. Hong Kong Accreditation Service (HKAS) has accredited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

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

Signatories	Position	Authorised results for
Chan Ka Yu, Karen	Manager - Organics	Organics
Kwok Ka Yan, Yankee	Chemist - Metals	Inorganics
Wong Wing, Kenneth	Manager - Metals	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. The completion date of analysis is: 06-NOV-2014

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: **HK1434707**

Sample(s) were collected by ALS Technichem (HK) staff on 22 October, 2014.

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

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

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

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



Analytical Results

Sub-Matrix: SOIL

Client sample ID

Client sampling date / time

				S16 (0.5M BCS)	S16A (DUPLICATE SAMPLE)	S17 (0.2M BCS)	S13 (0.11M BCS)	S12 (0.5M BCS)
				22-OCT-2014 14:05	22-OCT-2014 14:05	22-OCT-2014 14:20	22-OCT-2014 14:30	22-OCT-2014 14:38
Compound	CAS Number	LOR	Unit	HK1434707-004	HK1434707-005	HK1434707-006	HK1434707-007	HK1434707-008
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	4.2	4.6	7.0	7.2	9.2
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	<1	<1	<1
EG020: Barium	7440-39-3	1	mg/kg	3	5	3	3	5
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Copper	7440-50-8	1	mg/kg	2	2	1	1	1
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	<1	<1	<1	<1	<1
EG020: Nickel	7440-02-0	1	mg/kg	<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	1	mg/kg	23	23	26	33	25
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	2	2	<1	2	2
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1	<1	<1
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	96.5	96.1	97.9	99.3	104
4-Terphenyl-d14	1718-51-0	0.1	%	92.0	92.8	93.8	97.6	99.8
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	98.4	95.1	97.6	95.6	95.4
Toluene-D8	2037-26-5	0.1	%	103	103	103	105	104
4-Bromofluorobenzene	460-00-4	0.1	%	103	102	102	99.5	100



Sub-Matrix: SOIL				Client sample ID	S16 (0.5M BCS)	S16A (DUPLICATE SAMPLE)	S17 (0.2M BCS)	S13 (0.11M BCS)	S12 (0.5M BCS)
				Client sampling date / time	22-OCT-2014 14:05	22-OCT-2014 14:05	22-OCT-2014 14:20	22-OCT-2014 14:30	22-OCT-2014 14:38
Compound	CAS Number	LOR	Unit		HK1434707-004	HK1434707-005	HK1434707-006	HK1434707-007	HK1434707-008
EP-074_SR-S: VOC Surrogates				Surrogate control limits listed at end of this report.					
Dibromofluoromethane	1868-53-7	0.1	%		98.4	95.1	97.6	95.6	95.4
Toluene-D8	2037-26-5	0.1	%		103	103	103	105	104
4-Bromofluorobenzene	460-00-4	0.1	%		103	102	102	99.5	100



Sub-Matrix: SOIL				Client sample ID	S3 (0.1M BCS)	S2 (0.2M BCS)	S6 (0.1M BCS)	S7 (0.5M BCS)	S1 (0.5M BCS)
Client sampling date / time					22-OCT-2014 14:48	22-OCT-2014 14:55	22-OCT-2014 15:03	22-OCT-2014 15:12	22-OCT-2014 15:30
Compound	CAS Number	LOR	Unit		HK1434707-009	HK1434707-010	HK1434707-011	HK1434707-012	HK1434707-013
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		6.7	5.0	6.6	7.7	5.0
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		3	<1	<1	<1	2
EG020: Barium	7440-39-3	1	mg/kg		32	4	8	6	4
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Copper	7440-50-8	1	mg/kg		8	1	2	1	1
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		<1	<1	<1	<1	1
EG020: Nickel	7440-02-0	1	mg/kg		5	<1	<1	<1	<1
EG020: Zinc	7440-66-6	1	mg/kg		31	27	46	30	28
EG049: Trivalent Chromium	16065-83-1	1	mg/kg		8	1	2	1	3
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg		<1	<1	<1	<1	<1
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
								Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%		105	106	100	106	104
4-Terphenyl-d14	1718-51-0	0.1	%		101	102	97.8	101	100
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		96.9	90.1	96.9	96.6	98.5
Toluene-D8	2037-26-5	0.1	%		105	103	104	105	106
4-Bromofluorobenzene	460-00-4	0.1	%		102	100	102	101	102
EP-074_SR-S: VOC Surrogates									
								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		96.9	90.1	96.9	96.6	98.5



Sub-Matrix: SOIL				Client sample ID	S3 (0.1M BCS)	S2 (0.2M BCS)	S6 (0.1M BCS)	S7 (0.5M BCS)	S1 (0.5M BCS)
				Client sampling date / time	22-OCT-2014 14:48	22-OCT-2014 14:55	22-OCT-2014 15:03	22-OCT-2014 15:12	22-OCT-2014 15:30
Compound	CAS Number	LOR	Unit		HK1434707-009	HK1434707-010	HK1434707-011	HK1434707-012	HK1434707-013
EP-074_SR-S: VOC Surrogates - Continued								Surrogate control limits listed at end of this report.	
Toluene-D8	2037-26-5	0.1	%		105	103	104	105	106
4-Bromofluorobenzene	460-00-4	0.1	%		102	100	102	101	102



Sub-Matrix: SOIL				Client sample ID	S5 (0.2M BCS)	S9 (0.13M BCS)	S8 (0.1M BCS)	S4 (0.2M BCS)	
				Client sampling date / time	22-OCT-2014 15:46	22-OCT-2014 16:00	22-OCT-2014 16:33	22-OCT-2014 16:43	
Compound	CAS Number	LOR	Unit		HK1434707-014	HK1434707-015	HK1434707-016	HK1434707-017	
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		9.2	6.6	7.0	7.2	
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		1	<1	1	<1	
EG020: Barium	7440-39-3	1	mg/kg		11	6	8	3	
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	
EG020: Copper	7440-50-8	1	mg/kg		4	1	3	1	
EG020: Mercury	7439-97-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	
EG020: Molybdenum	7439-98-7	1	mg/kg		<1	<1	<1	<1	
EG020: Nickel	7440-02-0	1	mg/kg		1	1	1	<1	
EG020: Zinc	7440-66-6	1	mg/kg		32	29	28	22	
EG049: Trivalent Chromium	16065-83-1	1	mg/kg		2	2	4	1	
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg		<1	<1	<1	<1	
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	
Acenaphthylene	208-96-8	0.500	mg/kg		----	<0.500	----	----	
Acenaphthene	83-32-9	0.500	mg/kg		----	<0.500	----	----	
Fluorene	86-73-7	0.500	mg/kg		----	<0.500	----	----	
Phenanthrene	85-01-8	0.500	mg/kg		----	<0.500	----	----	
Anthracene	120-12-7	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	
Fluoranthene	206-44-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	
Pyrene	129-00-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	
Benz(a)anthracene	56-55-3	0.500	mg/kg		----	<0.500	----	----	
Chrysene	218-01-9	0.500	mg/kg		----	<0.500	----	----	
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg		----	<0.500	----	----	
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg		----	<0.500	----	----	
Benzo(a)pyrene	50-32-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg		----	<0.500	----	----	
Dibenz(a,h)anthracene	53-70-3	0.500	mg/kg		----	<0.500	----	----	
Benzo(g,h,i)perylene	191-24-2	0.500	mg/kg		----	<0.500	----	----	
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	5	mg/kg		<5	<5	<5	<5	
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200	<200	
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500	<500	
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	



Sub-Matrix: SOIL				Client sample ID	S5 (0.2M BCS)	S9 (0.13M BCS)	S8 (0.1M BCS)	S4 (0.2M BCS)	
				Client sampling date / time	22-OCT-2014 15:46	22-OCT-2014 16:00	22-OCT-2014 16:33	22-OCT-2014 16:43	
Compound	CAS Number	LOR	Unit		HK1434707-014	HK1434707-015	HK1434707-016	HK1434707-017	
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) - Continued									
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%		101	104	103	104	
4-Terphenyl-d14	1718-51-0	0.1	%		97.9	99.7	95.8	99.6	
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%		98.1	96.2	90.0	95.5	
Toluene-D8	2037-26-5	0.1	%		105	105	105	104	
4-Bromofluorobenzene	460-00-4	0.1	%		103	101	102	101	
EP-074_SR-S: VOC Surrogates									Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%		98.1	96.2	90.0	95.5	
Toluene-D8	2037-26-5	0.1	%		105	105	105	104	
4-Bromofluorobenzene	460-00-4	0.1	%		103	101	102	101	



Sub-Matrix: WATER				Client sample ID	FIELD BLANK	TRIP BLANK	EQUIPMENT BLANK		
Client sampling date / time					[22-OCT-2014]	[22-OCT-2014]	[22-OCT-2014]		
Compound	CAS Number	LOR	Unit		HK1434707-001	HK1434707-002	HK1434707-003		
EG: Metals and Major Cations - Filtered									
EG020: Arsenic	7440-38-2	10	µg/L		<10	----	<10		
EG020: Barium	7440-39-3	1	µg/L		<1	----	8		
EG020: Cadmium	7440-43-9	0.2	µg/L		<0.2	----	<0.2		
EG020: Copper	7440-50-8	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: 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-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	2.0	µg/L		<2.0	----	<2.0		
Anthracene	120-12-7	2.0	µg/L		<2.0	----	<2.0		
Fluoranthene	206-44-0	2.0	µg/L		<2.0	----	<2.0		
Pyrene	129-00-0	2.0	µg/L		<2.0	----	<2.0		
Benzo(a)pyrene	50-32-8	0.2	µg/L		<0.2	----	<0.2		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	20	µg/L		<20	<20	<20		
C9 - C16 Fraction	----	500	µg/L		<500	----	<500		
C17 - C35 Fraction	----	500	µg/L		<500	----	<500		
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	5.0	µg/L		<5.0	<5.0	<5.0		
Toluene	108-88-3	5.0	µg/L		<5.0	<5.0	<5.0		
Ethylbenzene	100-41-4	5.0	µg/L		<5.0	<5.0	<5.0		
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	<10	<10		
Styrene	100-42-5	5.0	µg/L		<5.0	----	----		
ortho-Xylene	95-47-6	5.0	µg/L		<5.0	<5.0	<5.0		
Xylenes (Total)	----	20	µg/L		<20	<20	<20		
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	500	µg/L		<500	----	----		
2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----		
EP-074_SR-E: Halogenated Aliphatics									
Methylene chloride	75-09-2	50	µg/L		<50	----	----		
Trichloroethene	79-01-6	5.0	µg/L		<5.0	----	----		
Tetrachloroethene	127-18-4	5.0	µg/L		<5.0	----	----		
EP-074_SR-G: Trihalomethanes (THM)									
Chloroform	67-66-3	5.0	µg/L		6.3	----	----		
Bromodichloromethane	75-27-4	5.0	µg/L		<5.0	----	----		
EP-074_SR-I: Methyl-tert-butyl Ether									



Sub-Matrix: WATER				Client sample ID	FIELD BLANK	TRIP BLANK	EQUIPMENT BLANK		
				Client sampling date / time	[22-OCT-2014]	[22-OCT-2014]	[22-OCT-2014]		
Compound	CAS Number	LOR	Unit		HK1434707-001	HK1434707-002	HK1434707-003		
EP-074_SR-I: Methyl-tert-butyl Ether - Continued									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	----	----		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%		71.0	----	70.6		
4-Terphenyl-d14	1718-51-0	0.1	%		124	----	112		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		103	99.8	104		
Toluene-D8	2037-26-5	0.1	%		103	103	103		
4-Bromofluorobenzene	460-00-4	0.1	%		103	101	103		
EP-074_SR-S: VOC Surrogates								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		103	99.8	104		
Toluene-D8	2037-26-5	0.1	%		103	103	103		
4-Bromofluorobenzene	460-00-4	0.1	%		103	101	103		



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 3690415)								
HK1434577-016	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	30.7	30.8	0.0
HK1434626-010	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	60.1	60.4	0.5
EA/ED: Physical and Aggregate Properties (QC Lot: 3690416)								
HK1434707-005	S16A (DUPLICATE SAMPLE)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	4.6	4.4	3.9
HK1434707-015	S9 (0.13M BCS)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	6.6	6.7	0.0
EG: Metals and Major Cations (QC Lot: 3691660)								
HK1434671-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	12.0	12.3	2.4
		EG020: Arsenic	7440-38-2	1	mg/kg	13	13	0.0
		EG020: Copper	7440-50-8	1	mg/kg	3	3	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	4	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	56	49	14.5
HK1434707-010	S2 (0.2M BCS)	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	0.0
		EG020: Barium	7440-39-3	1	mg/kg	4	4	0.0
		EG020: Copper	7440-50-8	1	mg/kg	1	1	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	<1	<1	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	27	25	6.8
EG: Metals and Major Cations (QC Lot: 3692320)								
HK1434707-005	S16A (DUPLICATE SAMPLE)	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
HK1434707-015	S9 (0.13M BCS)	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3688741)								
HK1434767-001	Anonymous	Fluoranthene	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Anthracene	120-12-7	50	µg/kg	<50	<50	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090)								
HK1434707-004	S16 (0.5M BCS)	Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	<50	<50	0.0
		Benz(a)anthracene	56-55-3	50	µg/kg	<50	<50	0.0



Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090) - Continued								
HK1434707-004	S16 (0.5M BCS)	Chrysene	218-01-9	50	µg/kg	<50	<50	0.0
		Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	<50	0.0
		Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	<50	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	<50	0.0
		Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	<50	0.0
		Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	<50	0.0
		Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)								
HK1434707-004	S16 (0.5M BCS)	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)								
HK1434707-004	S16 (0.5M BCS)	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3689101)								
HK1434707-004	S16 (0.5M BCS)	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3	1.0	mg/kg	<1.0	<1.0	0.0
		106-42-3						
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0		
Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 3690115)								
HK1434707-003	EQUIPMENT BLANK	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
		EG020: Barium	7440-39-3	1	µg/L	8	8	0.0
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
		EG020: Molybdenum	7439-98-7	1	µg/L	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.0
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3690116)								
HK1434707-003	EQUIPMENT BLANK	EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	<20	0.0
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 3685081)								
HK1434483-001	Anonymous	Naphthalene	91-20-3	0.2	µg/L	<0.2	<0.2	0.0
		Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2	0.0



Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 3685081) - Continued								
HK1434483-001	Anonymous	Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2	0.0
		Pyrene	129-00-0	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<0.2	0.0

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

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: CompoundCAS Number					Spike Concentration		Spike Recovery (%)		Recovery Limits (%)		RPD (%)
		LCS	DCS	Low			High	Value	Control Limit		
EG: Metals and Major Cations (QC Lot: 3691660)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	85.8	----	76	112	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	89.2	----	77	113	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	90.1	----	79	111	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	92.7	----	79	105	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	97.0	----	76	112	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	90.7	----	82	106	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	97.0	----	79	105	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	102	----	76	114	----	----
EG: Metals and Major Cations (QC Lot: 3692320)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	109	----	92	122	----	----
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3688741)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	99.5	----	59	111	----	----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	91.1	----	55	113	----	----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	98.8	----	64	116	----	----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	98.2	----	64	116	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	92.9	----	58	116	----	----
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	90.7	----	59	111	----	----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	94.3	----	53	115	----	----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	93.4	----	60	114	----	----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	96.9	----	61	116	----	----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	94.2	----	59	114	----	----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	89.8	----	55	113	----	----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	95.9	----	64	116	----	----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	94.0	----	64	116	----	----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	92.4	----	66	113	----	----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	97.3	----	87	126	----	----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	90.5	----	62	119	----	----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	98.3	----	64	112	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	89.2	----	58	116	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	84.8	----	61	120	----	----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	84.4	----	69	129	----	----



Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090) - Continued											
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	95.2	----	59	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.1	----	55	121	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	95.3	----	41	110	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	102	----	84	115	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3689101)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	101	----	83	111	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	86	112	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	108	----	88	116	----	----
meta- & para-Xylene	108-38-3	0.4	mg/kg	<0.4	0.6 mg/kg	93.4	----	92	112	----	----
	106-42-3										
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	108	----	88	116	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	111	----	92	112	----	----
Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 3690115)											
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	88.9	----	76	116	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	97.7	----	84	106	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	99.1	----	81	109	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	94.7	----	79	115	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	91.4	----	82	118	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	90.2	----	82	110	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	97.8	----	79	115	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	96.1	----	77	119	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 3690116)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	101	----	80	106	----	----
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 3685081)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	68.9	----	50	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	74.3	----	48	95	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	92.7	----	68	109	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	93.9	----	69	111	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	98.0	----	60	120	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689086)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	77.4	----	12	119	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	102	----	3	116	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3690350)											



Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3690350) - Continued											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	106	----	62	131	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3688374)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	96.5	----	77	118	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	96.9	----	77	121	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	103	----	77	121	----	----
meta- & para-Xylene	108-38-3	1	µg/L	<1	4 µg/L	106	----	90	111	----	----
	106-42-3										
Styrene	100-42-5	0.5	µg/L	<0.5	2 µg/L	96.2	----	77	113	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	101	----	76	120	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	104	----	88	111	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 3688374)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.0	----	77	123	----	----
2-Butanone (MEK)	78-93-3	5	µg/L	<5	20 µg/L	92.9	----	78	113	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 3688374)											
Methylene chloride	75-09-2	5	µg/L	<5	2 µg/L	89.8	----	77	124	----	----
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	91.7	----	78	111	----	----
Tetrachloroethene	127-18-4	0.5	µg/L	<0.5	2 µg/L	93.2	----	73	112	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 3688374)											
Chloroform	67-66-3	0.5	µg/L	<0.5	2 µg/L	90.8	----	77	117	----	----
Bromodichloromethane	75-27-4	0.5	µg/L	<0.5	2 µg/L	90.2	----	76	116	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 3688374)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	90.7	----	77	108	----	----



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

Matrix: SOIL

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3691660)										
HK1434654-001	Anonymous	EG020: Arsenic	7440-38-2	5 mg/kg	99.4	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	101	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	89.3	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	109	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	105	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	78.3	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	77.7	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 3692320)										
HK1434707-004	S16 (0.5M BCS)	EG3060: Hexavalent Chromium	18540-29-9	2.5 mg/kg	114	----	75	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)										
HK1434707-005	S16A (DUPLICATE SAMPLE)	C9 - C16 Fraction	----	31.5 mg/kg	82.1	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	89.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)										
HK1434707-005	S16A (DUPLICATE SAMPLE)	C6 - C8 Fraction	----	4.5 mg/kg	113	----	50	130	----	----

Matrix: WATER

Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 3690115)										
HK1434707-001	FIELD BLANK	EG020: Arsenic	7440-38-2	100 µg/L	89.2	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	96.7	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	98.6	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	90.7	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	91.3	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	93.1	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	99.1	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	94.3	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 3690116)										
HK1434707-001	FIELD BLANK	EG050: Hexavalent Chromium	18540-29-9	100 µg/L	103	----	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



Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates - Continued			
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

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: GAMMON CONSTRUCTION LTD	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 9
Contact	: MS MICHELLE TANG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1434899
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Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: WIL 705	Quote number	: ----	Date Samples Received	: 25-OCT-2014
Order number	: 1390891OP			Issue Date	: 07-NOV-2014
C-O-C number	: ----			No. of samples received	: 6
Site	: KENNEDY TOWN SITE OFFICE			No. of samples analysed	: 6

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 06-NOV-2014

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: **HK1434899**

Sample(s) were collected by ALS Technichem (HK) staff on 25 October, 2014.

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

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

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

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

Signatories

Position

Authorised results for

Chan Ka Yu, Karen
Wong Wing, Kenneth

Manager - Organics
Manager - Metals

Organics
Inorganics

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Analytical Results

Sub-Matrix: SOIL

				Client sample ID	S14 (0.5M BCS)	S18 (0.25M BCS)	S15 (0.5M BCS)	S10 (0.1M BCS)	S11 (0.5M BCS)
				Client sampling date / time	25-OCT-2014 09:00	25-OCT-2014 09:10	25-OCT-2014 09:40	25-OCT-2014 09:30	25-OCT-2014 09:50
Compound	CAS Number	LOR	Unit		HK1434899-001	HK1434899-002	HK1434899-003	HK1434899-004	HK1434899-005
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		5.2	6.6	6.6	7.4	5.5
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		<1	<1	<1	<1	<1
EG020: Barium	7440-39-3	1	mg/kg		4	6	3	7	4
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Copper	7440-50-8	1	mg/kg		<1	1	<1	3	1
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		<1	<1	<1	<1	1
EG020: Nickel	7440-02-0	1	mg/kg		<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	1	mg/kg		33	37	31	53	44
EG049: Trivalent Chromium	16065-83-1	1	mg/kg		2	2	2	2	2
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg		<1	<1	<1	<1	<1
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg		<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	5	mg/kg		<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
								Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%		101	101	106	102	90.6
4-Terphenyl-d14	1718-51-0	0.1	%		97.5	96.0	101	96.1	87.7
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		94.5	94.9	93.7	93.3	94.0
Toluene-D8	2037-26-5	0.1	%		105	104	104	104	105
4-Bromofluorobenzene	460-00-4	0.1	%		101	101	100	101	100
EP-074_SR-S: VOC Surrogates									
								Surrogate control limits listed at end of this report.	



Sub-Matrix: SOIL				Client sample ID	S14 (0.5M BCS)	S18 (0.25M BCS)	S15 (0.5M BCS)	S10 (0.1M BCS)	S11 (0.5M BCS)
				Client sampling date / time	25-OCT-2014 09:00	25-OCT-2014 09:10	25-OCT-2014 09:40	25-OCT-2014 09:30	25-OCT-2014 09:50
Compound	CAS Number	LOR	Unit		HK1434899-001	HK1434899-002	HK1434899-003	HK1434899-004	HK1434899-005
EP-074_SR-S: VOC Surrogates - Continued				Surrogate control limits listed at end of this report.					
Dibromofluoromethane	1868-53-7	0.1	%		94.5	94.9	93.7	93.3	94.0
Toluene-D8	2037-26-5	0.1	%		105	104	104	104	105
4-Bromofluorobenzene	460-00-4	0.1	%		101	101	100	101	100



Sub-Matrix: SOIL				Client sample ID	S19 (0.5M BCS)				
				Client sampling date / time	25-OCT-2014 09:20				
Compound	CAS Number	LOR	Unit		HK1434899-006				
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%		6.1				
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		<1				
EG020: Barium	7440-39-3	1	mg/kg		3				
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2				
EG020: Copper	7440-50-8	1	mg/kg		<1				
EG020: Mercury	7439-97-6	0.05	mg/kg		<0.05				
EG020: Molybdenum	7439-98-7	1	mg/kg		1				
EG020: Nickel	7440-02-0	1	mg/kg		<1				
EG020: Zinc	7440-66-6	1	mg/kg		44				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg		1				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg		<1				
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	0.500	mg/kg		<0.500				
Anthracene	120-12-7	0.500	mg/kg		<0.500				
Fluoranthene	206-44-0	0.500	mg/kg		<0.500				
Pyrene	129-00-0	0.500	mg/kg		<0.500				
Benzo(a)pyrene	50-32-8	0.500	mg/kg		<0.500				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	5	mg/kg		<5				
C9 - C16 Fraction	----	200	mg/kg		<200				
C17 - C35 Fraction	----	500	mg/kg		<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2				
Toluene	108-88-3	0.5	mg/kg		<0.5				
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5				
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0				
Styrene	100-42-5	0.5	mg/kg		<0.5				
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5				
Xylenes (Total)	----	2.0	mg/kg		<2.0				
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50				
2-Butanone (MEK)	78-93-3	5	mg/kg		<5				
EP-074_SR-E: Halogenated Aliphatics									
Methylene chloride	75-09-2	0.5	mg/kg		<0.5				
Trichloroethene	79-01-6	0.1	mg/kg		<0.1				
Tetrachloroethene	127-18-4	0.04	mg/kg		<0.04				
EP-074_SR-G: Trihalomethanes (THM)									



Sub-Matrix: SOIL				Client sample ID	S19 (0.5M BCS)				
				Client sampling date / time	25-OCT-2014 09:20				
Compound	CAS Number	LOR	Unit		HK1434899-006				
EP-074_SR-G: Trihalomethanes (THM) - Continued									
Chloroform	67-66-3	0.04	mg/kg		<0.04				
Bromodichloromethane	75-27-4	0.1	mg/kg		<0.1				
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%		95.6				
4-Terphenyl-d14	1718-51-0	0.1	%		94.6				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		94.6				
Toluene-D8	2037-26-5	0.1	%		105				
4-Bromofluorobenzene	460-00-4	0.1	%		101				
EP-074_SR-S: VOC Surrogates								Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%		94.6				
Toluene-D8	2037-26-5	0.1	%		105				
4-Bromofluorobenzene	460-00-4	0.1	%		101				



Laboratory Duplicate (DUP) Report

Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 3696411)								
HK1434899-001	S14 (0.5M BCS)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	5.2	5.2	0.0
HK1435009-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	25.2	25.7	1.8
EG: Metals and Major Cations (QC Lot: 3691662)								
HK1434780-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	40.4	34.0	17.2
		EG020: Arsenic	7440-38-2	1	mg/kg	10	9	0.0
		EG020: Copper	7440-50-8	1	mg/kg	18	17	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	31	29	5.0
		EG020: Zinc	7440-66-6	1	mg/kg	120	113	5.4
HK1434911-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	8	8	0.0
		EG020: Barium	7440-39-3	1	mg/kg	36	30	19.6
		EG020: Copper	7440-50-8	1	mg/kg	17	19	14.2
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	3	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	3	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	60	67	10.3
EG: Metals and Major Cations (QC Lot: 3692320)								
HK1434707-005	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
HK1434707-015	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 3692321)								
HK1434911-001	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090)								
HK1434707-004	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)								
HK1434707-004	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)								
HK1434707-004	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3689101)								
HK1434707-004	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0



Matrix: SOIL				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3689101) - Continued								
HK1434707-004	Anonymous	Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3	1.0	mg/kg	<1.0	<1.0	0.0
			106-42-3					
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 3689101)								
HK1434707-004	Anonymous	2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.0
		2-Propanone (Acetone)	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 3689101)								
HK1434707-004	Anonymous	Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	<0.04	0.0
		Trichloroethene	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
		Methylene chloride	75-09-2	0.5	mg/kg	<0.5	<0.5	0.0
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 3689101)								
HK1434707-004	Anonymous	Chloroform	67-66-3	0.04	mg/kg	<0.04	<0.04	0.0
		Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 3689101)								
HK1434707-004	Anonymous	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

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

Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		Method: Compound	CAS Number	LOR		Unit	Result	LCS	DCS	Low	High
EG: Metals and Major Cations (QC Lot: 3691662)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	90.2	----	76	112	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	92.8	----	77	113	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	91.1	----	79	111	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	97.7	----	79	105	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	90.6	----	76	112	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	90.6	----	82	106	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	97.9	----	79	105	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	104	----	76	114	----	----
EG: Metals and Major Cations (QC Lot: 3692320)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	109	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 3692321)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	106	----	92	122	----	----
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	90.7	----	59	111	----	----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	89.8	----	55	113	----	----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	95.9	----	64	116	----	----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	94.0	----	64	116	----	----



Matrix: SOIL		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3689090) - Continued											
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	89.2	----	58	116	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	90.1	----	55	121	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	95.3	----	41	110	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	102	----	84	115	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 3689101)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	101	----	83	111	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	103	----	86	112	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	108	----	88	116	----	----
meta- & para-Xylene	108-38-3	0.4	mg/kg	<0.4	0.6 mg/kg	93.4	----	92	112	----	----
	106-42-3										
Styrene	100-42-5	0.2	mg/kg	<0.2	0.25 mg/kg	101	----	85	109	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	108	----	88	116	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	111	----	92	112	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 3689101)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	94.1	----	80	119	----	----
2-Butanone (MEK)	78-93-3	2	mg/kg	<2	2.5 mg/kg	97.8	----	85	108	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 3689101)											
Methylene chloride	75-09-2	0.5	mg/kg	<0.5	0.25 mg/kg	88.8	----	85	117	----	----
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	94.6	----	83	110	----	----
Tetrachloroethene	127-18-4	0.04	mg/kg	<0.04	0.25 mg/kg	95.4	----	84	109	----	----
EP-074_SR-G: Trihalomethanes (THM) (QC Lot: 3689101)											
Chloroform	67-66-3	0.04	mg/kg	<0.04	0.25 mg/kg	96.5	----	86	107	----	----
Bromodichloromethane	75-27-4	0.1	mg/kg	<0.1	0.25 mg/kg	104	----	81	110	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 3689101)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.1	----	84	110	----	----



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

Matrix: SOIL

Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3691662)										
HK1434780-001	Anonymous	EG020: Arsenic	7440-38-2	5 mg/kg	94.3	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	101	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	88.4	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	96.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	104	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	83.2	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 3692320)										
HK1434707-004	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	2.5 mg/kg	114	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 3692321)										
HK1434899-006	S19 (0.5M BCS)	EG3060: Hexavalent Chromium	18540-29-9	2.5 mg/kg	108	----	75	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689089)										
HK1434707-005	Anonymous	C9 - C16 Fraction	----	31.5 mg/kg	82.1	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	89.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3689102)										
HK1434707-005	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	113	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

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