terrafirma

Our Ref: RH/12032/let18

Your Ref:

Contact:

Terra Firma (Wales) Ltd.
Consulting Geo-Technical & Geo-Environmental Engineers
Site Investigation Contractors

5 Deryn Court, Wharfedale Road,
Pentwyn, Cardiff CF23 7HB
Tel: 029 2073 5354 Fax: 029 2073 5433
Email: info@terrafirmawales.co.uk
www.terrafirmawales.co.uk

1st April 2014

Greenhill Construction Limited
Esperanto Way
Newport
NP19 0RD

For the attn. of Mr Stuart Jones

Dear Stuart

ADDITIONAL GROUNDWATER MONITORING: HERBERT ROAD NEWPORT

I confirm that we have completed the additional groundwater sampling and testing requested at the above site.

On two occasions all six deep groundwater wells were sampled.

Borehole Summary			
Borehole	Depth of Borehole (m)	Depth to Groundwater (m)	
		06.03.2014	19.03.2014
BH1	10.6	0.71	0.9
BH2	12.9	1.0	0.76
BH3	9.7	6.35	6.49
BH4	10.2	2.14	2.07
BH5	8.0	3.0	3.16
BH6	10.3	0.4	0.7

Each borehole was purged prior to sampling. This was undertaken using a battery operated pump. The volume of perched groundwater purged was calculated by:

Volume = (3 x cross sectional area of borehole, including gravel) x depth of groundwater Purged

The groundwater samples were submitted to the laboratories of Derwentside Environmental Testing Services Limited. The test certificates are appended.

In the following tables results have been compared to thresholds provided by the Water Framework Directive (for Inland Surface Waters - Annual Average) and in their absence the Drinking Water Directive.

terrafirma

Summary of Groundwater Chemical Test Results Standard Suite and Phenols

Substance	Threshold (mg/l)	Source	Measured Concentrations of Tested Substances (mg/l)				Number of exceedences
			Round 1		Round 2		
			Min	Max	Min	Max	
Arsenic	0.05	WFD	0.00042	0.0048	0.00044	0.0068	0
Cadmium	0.00025*	WFD	<0.00003	0.00004	<0.00003	<0.00003	0
Chromium	0.0091**	WFD	0.00029	0.00078	<0.00025	0.0022	0
Copper	0.028*	WFD	<0.0004	0.0014	<0.0004	0.0013	0
Lead	0.0072	WFD	0.00013	0.00021	<0.00009	0.00019	0
Mercury	0.0005	WFD	<0.00001	<0.00001	<0.00001	0.00001	0
Nickel	0.02	WFD	<0.0005	0.0042	<0.0005	0.0058	0
Selenium	0.01	DWD	<0.00025	0.0019	<0.00025	0.00092	0
Zinc	0.125*	WFD	0.0259	0.160	0.00311	0.122	1
Cyanide	0.001	WFD	<0.04	<0.04	<0.04	<0.04	BLDL
Sulphate	250	BRE	6.6	68	2.9	70	0
pH	-	-	7.0	7.4	7.1	7.4	-
Sulphide	-	-	<0.01	0.011	<0.01	<0.01	-
BOD	-	-	<1.0	10	<1.0	3.3	-
COD	-	-	<10	670	<10	330	-
Hardness	-	-	285	614	268	625	-
Total Phenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
4-chloro-3-methylphenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
2,4-dichlorophenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
2,4 – dimethylphenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
p-cresol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
2,6-dimethylphenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
2,6-dichlorophenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
2,4,6-trichlorophenol	0.0077	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0

Notes:

- * Guideline dependent on hardness of >200mg $CaCo_3$/l
- ** Addition of guideline for Chromium III and Chromium VI
- - No guideline available
- BLDL - Below Laboratory Detection Limit

terrafirma

Summary of Groundwater Chemical Test Results
Speciated PAH and Petroleum Hydrocarbons

Substance	Threshold (mg/l)	Source	Measured Concentrations of Tested Substances (mg/l)				Number of exceedences
			Round 1		Round 2		
			Min	Max	Min	Max	
Acenapthene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Acenaphthylene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Anthracene	0.0001	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Benzo(a)anthracene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Benzo(a)pyrene	0.00005	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Benzo(b)fluoranthene	0.00003	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Benzo(k)fluoranthene	0.00003	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Benzo(ghi)perylene	0.000002	WFD	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Chrysene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Dibenzo(ah)anthracene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Fluoranthene	0.0001	WFD	<0.00001	0.00001	<0.00001	<0.00001	0
Fluorene	-	-	<0.00001	0.00002	<0.00001	<0.00001	BLDL
Indeno(123cd)pyrene	0.00002	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Naphthalene	0.0024	WFD	<0.00001	<0.00001	<0.00001	<0.00001	0
Phenanthrene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
Pyrene	-	-	<0.00001	<0.00001	<0.00001	<0.00001	BLDL
PH- Aliphatic							
>C5-C6	-	-	<0.0001	<0.0001	<0.0001	<0.0001	BLDL
>C6-C8	-	-	<0.0001	<0.0001	<0.0001	<0.0001	BLDL
>C8-C10	-	-	<0.0001	<0.0001	<0.0001	<0.0001	BLDL
>C10-C12	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C12-C16	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C16-C21	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C21-C35	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
PH- Aromatic							
>C5-C7 (benzene)	0.01	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
>C7-C8 (toluene)	0.05	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
>C8-C10 (xylenes)	0.03	WFD	<0.0001	<0.0001	<0.0001	<0.0001	0
>C10-C12	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C12-C16	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C16-C21	-	-	<0.001	<0.001	<0.001	<0.001	BLDL
>C21-C35	-	-	<0.001	<0.001	<0.001	<0.001	BLDL

Notes

- - No guideline available. BLDL - Below Laboratory Detection Limit

All substances were found to be present at concentrations below their respective threshold level with the exception of zinc on one occasion.

Zinc was recorded at a concentration of 0.16mg/l in BH5 during the first sampling round, exceeding the guideline of 0.125mg/l.

This exceedence is marginal and was not noted during the second monitoring round. It should also be noted that elevated zinc was not found during previous groundwater monitoring carried out by Terra Firma. Indeed, no groundwater contamination was previously identified other than that attributed to oil spilt during the drilling process (picked up only on the initial groundwater monitoring round in January 2013).

Terra Firma previously reported that the groundwater beneath the site does not have hydrological continuity with the River Usk.

It is therefore concluded that the occurrence of zinc does not present a concern with regards to an impact on the aquatic environment.

I trust that the above is to your satisfaction, however, if you have any queries or require any further information please do not hesitate to contact me.

Yours sincerely
for: Terra Firma (Wales) Ltd

R. Howells

Mrs Ruth Howells

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 14-00774

18-Mar-14

Client Terra Firma (Wales) Ltd
5 Deryn Court
Wharfdale Road
Pentwyn
Cardiff
CF23 7HB

Our Reference 14-00774

Client Reference 12032

Contract Title Herbert Road

Description 6 Water samples.

Date Received 10-Mar-14

Date Started 10-Mar-14

Date Completed 18-Mar-14

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Rob Brown
Business Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 14-00774
Client Ref 12032
Contract Title Herbert Road

			Lab No	617652	617653	617654	617655	617656	617657
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	06/03/14	06/03/14	06/03/14	06/03/14	06/03/14	06/03/14
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	2.7	2.6	0.42	1.1	4.8	0.70
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.31	0.60	2.0	0.29	0.37	0.78
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.9	0.6	< 0.4	1.4	0.6	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.16	0.13	0.14	0.21	0.21	0.16
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	4.2	0.8	0.5	3.6	1.2	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.52	0.27	< 0.25	0.41	< 0.25	1.9
Zinc, Dissolved	DETSC 2306	1.25	ug/l	43.7	25.9	32.6	54.2	160	43.5
Inorganics									
Conductivity	DETSC 2009	1	uS/cm	1620	3790	2780	676	1690	704
pH	DETSC 2008			7.4	7.1	7.0	7.0	7.2	7.4
Total Biochemical Oxygen Demand	DETSC 2031	1	mg/l	< 1.0	< 1.0	< 1.0	10	4.2	< 1.0
Total Chemical Oxygen Demand	DETSC 2032	10	mg/l	27	40	23	620	670	< 10
Cyanide total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Hardness	DETSC 2303*	0.1	mg/l	328	365	614	317	499	285
Sulphate as SO4	DETSC 2055	0.1	mg/l	29	6.6	56	59	68	32
Sulphide	DETSC 2208	10	ug/l	< 10	11	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	94	85	97	870	98	73

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 14-00774
Client Ref 12032
Contract Title Herbert Road

			Lab No	617652	617653	617654	617655	617656	617657
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	06/03/14	06/03/14	06/03/14	06/03/14	06/03/14	06/03/14
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Acenaphthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Fluorene	DETS 074*	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
PAH	DETS 074*	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenols									
Phenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Chloro-3-methylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dimethylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
p-cresol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dimethylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4,6-Trichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 14-00774
Client Ref 12032
Contract Herbert Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
617652	BH1 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	
617653	BH2 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	
617654	BH3 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	
617655	BH4 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	
617656	BH5 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	
617657	BH6 WATER	06/03/14	GJ 1L (1L) x2, GJ 250ml (250ml) x2, PB 1L (1L) x2	BOD (2 days)	

Key: G-Glass P-Plastic J-Jar B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 14-01865

02-Apr-14

Client Terra Firma (Wales) Ltd
5 Deryn Court
Wharfdale Road
Pentwyn
Cardiff
CF23 7HB

Our Reference 14-01865

Client Reference 12032

Contract Title Herbert Road

Description 6 Water samples.

Date Received 21-Mar-14

Date Started 21-Mar-14

Date Completed 26-Mar-14

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Rob Brown
Business Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 14-01865
Client Ref 12032
Contract Title Herbert Road

			Lab No	623636	623637	623638	623639	623640	623641
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	19/03/14	19/03/14	19/03/14	19/03/14	19/03/14	19/03/14
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	4.0	4.2	0.44	6.8	1.1	0.47
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	0.73	2.2	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.7	< 0.4	< 0.4	< 0.4	1.3	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	0.13	< 0.09	0.19	0.14	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	5.8	1.3	< 0.5	0.9	2.0	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.34	< 0.25	< 0.25	0.67	0.37	0.92
Zinc, Dissolved	DETSC 2306	1.25	ug/l	4.21	5.89	6.75	122	16.2	3.11
Inorganics									
Conductivity	DETSC 2009	1	uS/cm	1660	3750	2890	954	1670	764
pH	DETSC 2008			7.3	7.1	7.0	7.2	7.2	7.4
Total Biochemical Oxygen Demand	DETSC 2031	1	mg/l	< 1.0	< 1.0	< 1.0	3.3	< 1.0	< 1.0
Total Chemical Oxygen Demand	DETSC 2032	10	mg/l	21	56	28	18	330	< 10
Cyanide total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Hardness	DETSC 2303*	0.1	mg/l	310	394	625	442	424	268
Sulphate as SO4	DETSC 2055	0.1	mg/l	13	2.9	40	70	56	31
Sulphide	DETSC 2208	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	150	110	68	450	< 10	93

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 14-01865
Client Ref 12032
Contract Title Herbert Road

			Lab No	623636	623637	623638	623639	623640	623641
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	19/03/14	19/03/14	19/03/14	19/03/14	19/03/14	19/03/14
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Acenaphthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETS 074*	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETS 074*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH	DETS 074*	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenols									
Phenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Chloro-3-methylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dimethylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
p-cresol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dimethylphenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4,6-Trichlorophenol	DETS 054*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 14-01865
Client Ref 12032
Contract Herbert Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
623636	BH1 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	
623637	BH2 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	
623638	BH3 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	
623639	BH4 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	
623640	BH5 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	
623641	BH6 WATER	19/03/14	GJ 1L (1L), GV (40ml), PB 1L (1L)	BOD (2 days)	

Key: G-Glass P-Plastic J-Jar B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months