Our Ref: RH/12976/Let7

Your Ref:

Contact: Ruth Howells

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

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

17th May 2019

J R Smart
7/8 Park Place
Cardiff
CF10 3DP

For the attn. of Mr Alex Smart

Dear Alex

GROUNDWATER ASSESSMENT: JOHN STREET, CARDIFF

1.0 Introduction

J R (Builders) Limited is proposing the development of an area of land at John Street, Cardiff.

Terra Firma (Wales) Limited completed investigation of the site in 2015 and 2016, as detailed in Geotechnical and Geo-environmental Report No.12976/1.

As part of the investigation one round of groundwater sampling and testing was completed in order to undertake a contamination assessment.

Terra Firma (Wales) Limited were retained by J R (Builders) Limited in 2019 to complete further assessment of the groundwater.

2.0 Groundwater Monitoring Well Installation

During the 2015 site investigation six in-situ groundwater monitoring wells were installed in cable percussive boreholes (BH1 – BH6).

Approximate borehole locations are illustrated below.

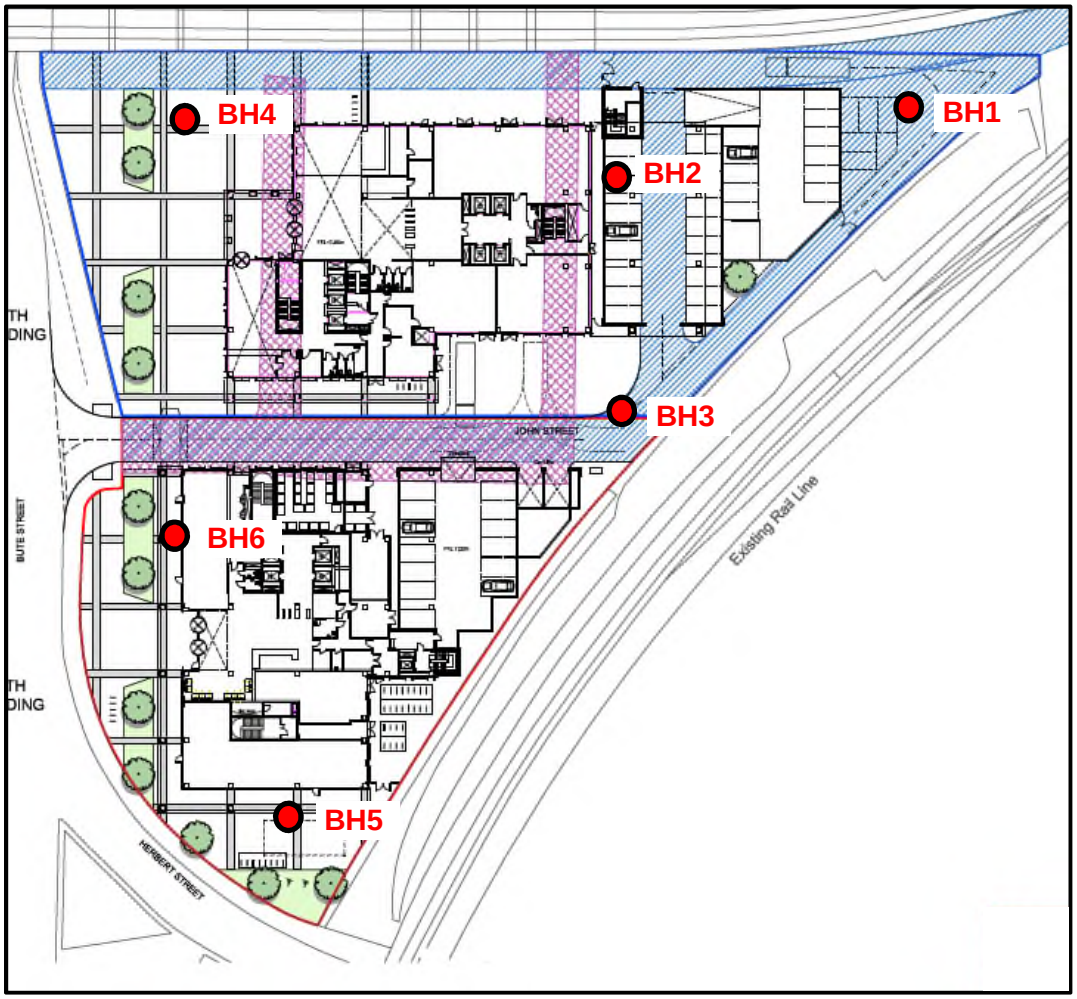

Figure 2.1: Borehole Locations

Borehole logs may be found in **Annex A**. The ground conditions confirmed on site are summarised in **Table 2.1** below.

A groundwater monitoring well was installed in each borehole, with the response zones within the in-situ granular glaciofluvial deposits and weathered marl. The well installations are detailed in the following table.

Table 2.2 Groundwater Well Installations

Location	Full Installation Depth (mbgl)	Response Zone (mbgl)	Installation Details
BH1	9.0	3.4 – 9.0	Plain pipe with bentonite seal to 3.4m with slotted pipe and geotextile sock and gravel surround to 9.0m
BH2	8.0	3.4 – 8.0	Plain pipe with bentonite seal to 3.4m with slotted pipe and geotextile sock and gravel surround to 8.0m
BH3	8.0	3.4 – 8.0	Plain pipe with bentonite seal to 3.4m with slotted pipe and geotextile sock and gravel surround to 8.0m
BH4	9.0	4.2 – 9.0	Plain pipe with bentonite seal to 4.2m with slotted pipe and geotextile sock and gravel surround to 9.0m
BH5	9.5	4.4 – 9.5	Plain pipe with bentonite seal to 4.4m with slotted pipe and geotextile sock and gravel surround to 9.5m
BH6	8.0	4.0 – 8.0	Plain pipe with bentonite seal to 4.0m with slotted pipe and geotextile sock and gravel surround to 8.0m

3.0 Groundwater Sampling and Testing

Samples of groundwater was taken from each of the water wells on three occasions, on the 27.01.2015, 17.04.2019 and 01.05.2019. For the 2019 sampling rounds BH2 could not be located.

The following method was employed in the taking the water samples:

1. Measurement of groundwater levels was taken with a dip meter.

Table 2.1 Groundwater Levels During Monitoring

Borehole	Depth of water-bearing Strata (mbgl)	Depth (mbgl)	
		08.04.2019	01.05.2019
BH1 (fluvio-glacial deposits)	3.4 – 5.3	3.1	8.1
BH3 (fluvio-glacial deposits)	3.4 – 5.4	2.8	8.6
BH4 (gravelly clay)	4.2 – 5.6	3.4	9.9
BH5 (fluvio-glacial deposits)	4.0 – 5.9	2.3	6.5
BH6 (fluvio-glacial deposits)	4.4 – 5.7	2.83	8.5

Borehole logs generally record the depth of the groundwater bearing fluvio-glacial deposits to become deeper towards the south and west.

However, both sets of groundwater level readings broadly indicate a down-gradient groundwater level towards the north.

2. 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 purged = (3 x cross sectional area of borehole, including gravel) x depth of groundwater within borehole.

3. The groundwater samples were stored within the appropriate sample jar within a cool box. The samples were taken to the laboratory on the day of their collection.

Groundwater samples were submitted for laboratory analysis for a suite of metals, inorganics, TPHCWG, speciated PAH, PCBs, Phenols, VOCs and SVOCs.

The laboratory groundwater chemical test results are presented in **Annex B**.

4.0 Quantitative Groundwater Risk Assessment

4.1 Groundwater Assessment Methodology

Groundwater results have been compared to thresholds for inland freshwater environments (annual average or maximum allowable concentration where annual average not available) provided by the 2015 UK Water Framework Directive (WFD).

No WFD thresholds are available for reference has therefore been made to Dangerous Substance Directive (DSD) or Drinking Water Directive (DWD) criteria in their absence.

For TPHCWG WHO thresholds as quoted by 'CLAIRE: Petroleum Hydrocarbons in Groundwater (2017)' have been utilised where available.

Where unavailable a target concentration (TC) of 10ug/l has been applied.

4.2 Groundwater Test Results

Groundwater results from all three testing rounds are summarised in the following tables.

Table 4.1 Summary of Groundwater Chemical Test Results Standard Suite

Substance	Threshold (ug/l)	Source	Measured Concentrations of Tested Substances (ug/l)		Number of Exceedances
			Minimum	Maximum	
Arsenic	50	WFD	0.56	2.4	0
Cadmium	0.25*	WFD	<0.03	0.08	0
Total Chromium	-	-	<0.25	6.5	-
Chromium III	4.7	WFD	<20	<20	BLDL
Chromium VI	3.4	WFD	<20	<20	BLDL
Copper	1.0	WFD	0.7	20	**12**
Lead	1.2	WFD	<0.09	1.5	**1**
Mercury	0.07	WFD	<0.01	<0.01	0
Nickel	4.0	WFD	<0.5	5.3	**1**
Selenium	10	DWD	0.27	6.8	0
Zinc	13.7**	WFD	<1.0	394	**8**
Cyanide	1.0	WFD	<5.0	<40	BLDL
pH	-	-	7.4	9.2	-
BOD (mg O_2/l)	-	-	<1.0	6.0	-
COD (mg O_2/l)	-	-	<10	19	-
Hardness (mg/l)	-	-	140	990	-
Sulphate (mg/l)	500	BRE	47	1000	-

Notes:

- *Cadmium threshold dependant on hardness
- ** Takes into account ambient background concentration of the River Taff
- BLDL – Below Laboratory Detection Limit

The 2015 results provide only a total chromium concentration.

Please note that total chromium concentrations for all 2019 water samples fall below the CrIII and CrVI threshold levels.

Table 4.2 Summary of Groundwater Chemical Test Results Speciated Polyaromatic Hydrocarbons, PCBs and Phenol

Substance	Threshold (ug/l)	Source	Measured Concentrations of Tested Substances (ug/l)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.0	WFD	<0.01	0.07	0
Acenaphthylene	-	-	<0.01	<0.01	-
Acenaphthene	-	-	<0.01	<0.01	-
Fluorene	-	-	<0.01	<0.01	-
Phenanthrene	-	-	<0.01	0.03	1 ALDL
Anthracene	0.1	WFD	<0.01	<0.01	0
Fluoranthene	0.0063	WFD	<0.01	0.06	1 ALDL
Pyrene	-	-	<0.01	0.04	1 ALDL
Benzo(a)anthracene	-	-	<0.01	0.05	1 ALDL
Chrysene	-	-	<0.01	0.04	1 ALDL
Benzo(b)fluoranthene	0.017	WFD	<0.01	0.02	**1**
Benzo(k)fluoranthene	0.017	WFD	<0.01	0.02	**1**
Benzo(a)pyrene	0.00017	WFD	<0.01	<0.01	BLDL
Indeno(123cd)pyrene	-	-	<0.01	<0.01	-
Dibenzo(ah)anthracene	-	-	<0.01	<0.01	-
Benzo(ghi)perylene	0.0082	WFD	<0.01	<0.01	BLDL
Total PCBs	-	-	<1.0	<1.0	-
Total Phenols	7.7	WFD	<0.1	<30	BLDL

Notes:

- BLDL – Below Laboratory Detection Limit
- ALDL – Above Laboratory Detection Limit

All VOCs and SVOCs were found to be at concentrations below the levels of laboratory detection.

Table 4.3 Summary of Groundwater Chemical Test Results Petroleum Hydrocarbons and BTEX					
Substance	**Threshold ug/l**	**Source**	**Measured Concentrations of Tested Substances (ug/l)**		**Number of Exceedances**
			Minimum	**Maximum**	
Aliphatic					
PH C5 – C6 Ali	15000	WHO	<0.1	<0.1	0
PH C6 – C8 Ali	15000	WHO	<0.1	<0.1	0
PH C8 – C10 Ali	300	WHO	<0.1	<0.1	0
PH C10 – C12 Ali	300	WHO	<1.0	<1.0	0
PH C12 – C16 Ali	300	WHO	<1.0	<1.0	0
PH C16 – C21 Ali	10	TC	<1.0	42	**2**
PH C21 – C35 Ali	10	TC	<1.0	96	**2**
Aromatic					
PH C5 – C7 Arom	10	TC	<0.1	<0.1	0
PH C7 – C8 Arom	10	TC	<0.1	<0.1	0
PH C8 – C10 Arom	300*	WHO	<0.1	<0.1	0
PH C10 – C12 Arom	90	WHO	<1.0	<1.0	0
PH C12 – C16 Arom	90	WHO	<1.0	8.8	0
PH C16 – C21 Arom	90	WHO	<1.0	24	0
PH C21 – C35 Arom	90	WHO	<1.0	11	0
Benzene	10	WFD	<1.0	<1.0	**0**
Toluene	74	WFD	<1.0	<1.0	0
Ethylbenzene	20	DSD	<1.0	<1.0	0
Xylene	30	DSD	<1.0	<1.0	0

Notes:

- BLDL – Below Laboratory Detection Limit
- * Threshold for ethylbenzene

4.3 Summary of Groundwater Contamination

Table 4.4 below summarises the contamination identified in groundwater beneath the site.

Table 4.4 Summary of Contaminants in Groundwater

Substance	Threshold (ug/l)	Recorded Concentration (ug/l)	Location
Copper	1.0	2.1 3.8 1.1 1.7 2.7 3.0 1.5 1.1 1.4 1.6 20 1.4	BH1 (1) BH2 (1) BH3 (1) BH5 (1) BH6 (1) BH1 (2) BH4 (2) BH5 (2) BH6 (2) BH4 (3) BH5 (3) BH6 (3)
Lead	1.2	1.5	BH2 (1)
Nickel	4.0	5.3	BH6 (1)
Zinc	13.7	24.8 72.6 21.8 19.2 394 20 23 25	BH1 (1) BH2 (1) BH3 (1) BH4 (1) BH6 (1) BH4 (2) BH5 (2) BH6 (2)
Benzo(b)fluoranthene	0.017	0.02	BH2 (1)
Benzo(k)fluoranthene	0.017	0.02	BH2 (1)
PH C16 – C21 Ali	10	42 18	BH5 (1) BH6 (1)
PH C21 – C35 Ali	10	96 64	BH5 (1) BH6 (1)

Notes:

- (1) Denotes monitoring round

4.4 Conclusions

Table 4.4 records contaminants in groundwater that appear inconsistently, with the exception of copper.

Similarly, contaminants identified in groundwater do not have any correlation to substances found to be contaminative in site soils with the exception of lead, but this was exceeded in only 1 of 12 water samples, demonstrating that site soils are highly unlikely to be the source of groundwater contaminants. It may therefore be assumed with some confidence that the contamination originates off-site.

Groundwater was recorded at between 3.4m and 4.4m beneath the site within the fluvio-glacial gravel horizon. At this depth the groundwater will not impact upon the dock feeder channel directly adjacent to the north-eastern corner of the site.

The River Taff situates 550m to the west. The groundwater flow direction does not appear to be in this direction, in addition, at this distance the contaminant concentrations can be expected to deteriorate significantly with the effects of the dilution and attenuation.

Based on the above it may be concluded that groundwater beneath the site does not present a risk to the wider aquatic environment and no further action is required.

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

Mrs Ruth Howells

Annex A
Borehole Logs

terrafirma

Borehole Log

Borehole No.
BH1
Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 15/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00		N=5 (3,4/2,1,1,1)				MADE GROUND: Clayey gravelly Building Rubble, loose at 1m depth
					1.70			
		2.00		N=14 (2,1/2,3,3,6)				Firm brown grey sandy gravelly CLAY
		3.00		N=39 (6,7/7,9,8,15)				
					3.40			
		4.00		N=30 (2,4/5,5,9,11)				Dense becoming medium dense brown SAND and GRAVEL and COBBLE
		5.00		N=11 (4,5/4,3,2,2)				
					5.30			Weathered red MARL
		6.50		N=19 (2,2/2,3,6,8)	6.40			Red and grey MARL
		8.00		N=2 (1,1/0,0,0,2)				
					8.80			SANDSTONE
		9.00		N=50 (25 for 95mm/50 for 30mm)	9.00			End of borehole at 9.00 m

Remarks

AGS

terrafirma

Borehole Log

Borehole No. **BH2**

Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 16/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00		N=6 (3,1/2,1,1,2)				MADE GROUND: Clayey gravelly Building Rubble. Loose at 1.0m depth.
					1.50			
		2.00		N=11 (2,2/3,2,3,3)				Firm becoming very stiff brown sandy gravelly cobbly CLAY
		3.00		N=27 (25 for 135mm/10,9,7,1)				
	▼				3.40			Dense brown SAND and GRAVEL and COBBLE
		4.00		N=36 (9,12/10,11,7,8)				
		5.00		N=41 (7,9/41 for 200mm)				
					5.70			Red gravelly CLAY
		6.50		N=9 (2,1/1,2,3,3)	6.40			Weathered red MARL
		8.00		N=50 (4,14/50 for 170mm)	8.10			Red and grey MARL
					8.40			End of borehole at 8.40 m

Remarks

AGS

terrafirma

Borehole Log

Borehole No. **BH3**

Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 19/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00		N=13 (1,1/2,2,2,7)				MADE GROUND: Grey ashy clayey SAND and GRAVEL and COBBLE
					1.50			
		2.00		N=23 (2,4/5,7,5,6)				Stiff brown sandy gravelly cobbly CLAY
		3.00		N=38 (4,9/9,10,11,8)				
	▼				3.40			
		4.00		N=50 (4,6/50 for 275mm)				Very dense becoming medium dense brown SAND and GRAVEL and COBBLE
		5.00		N=23 (2,3/5,5,6,7)				
					5.40			Red gravelly CLAY
					6.30			Red MARL
		6.50		N=32 (7,6/7,8,8,9)				
		8.00		N=36 (4,11/12,13,5,6)				
					8.50			End of borehole at 8.50 m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

terrafirma

Borehole Log

Borehole No.
BH4
Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 13/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			TARMAC
					0.60			MADE GROUND: SUB-BASE
		1.00		N=7 (1,2/2,2,1,2)				MADE GROUND: Building Rubble
		2.00		N=8 (1,1/1,2,3,2)				
		3.00		N=0 (1,1/0,0,0,0)				
	▼	4.00		N=52 (3,1/15,12,11,14)	4.20			
		5.00		N=24 (2,6/7,4,6,7)				Stiff brown sandy gravelly CLAY
					5.60			Weathered red MARL
		6.50		N=13 (2,3/2,2,5,4)				
		9.00		N=50 (5,8/50 for 245mm)	9.10			Red MARL
					9.40			End of borehole at 9.40 m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

terrafirma

Borehole Log

Borehole No. **BH5**

Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 21/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00		N=27 (48 for 105mm/27 for 60mm)				MADE GROUND: Very dense ashy slag GRAVEL and BOULDER
		2.00		N=22 (9,10/8,4,5,5)				
					2.20			Firm becoming very stiff and very stiff brown sandy gravelly cobbly CLAY
		3.00		N=50 (8,14/50 for 235mm)				
		4.00		N=50 (4,7/50 for 245mm)				
					4.40			Very dense becoming medium dense brown SAND and GRAVEL and COBBLE
		5.00		N=38 (6,8/11,10,8,9)				
					5.70			Stiff red gravelly CLAY
		6.50		N=23 (5,4/4,6,5,8)				
					7.40			Weathered MARL
		8.00		N=34 (2,3/4,7,11,12)				
		9.50		N=50 (5,6/50 for 275mm)				
					9.60			Red MARL
					9.90			End of borehole at 9.90 m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

terrafirma

Borehole Log

Borehole No.
BH6
Sheet 1 of 1

Project Name: John Street	Project No. 12976	Co-ords: -	Hole Type CP
Location: Cardiff		Level:	Scale 1:50
Client: J.R. Smart		Dates: 23/01/2015 -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00		N=9 (2,3/3,4,1,1)				MADE GROUND: Ashy GRAVEL, Building Rubble
					1.70			
		2.00		N=7 (1,0/1,1,2,3)				Soft becoming stiff brown sandy gravelly cobbly CLAY
		3.00		N=33 (4,5/12,8,6,7)				
		4.00		N=35 (8,14/10,6,9,10)	4.00			Dense becoming very dense brown SAND and GRAVEL and COBBLE
		5.00		N=0 (75 for 40mm/0 for 75mm)				
					5.90			Red CLAY
		6.50		N=9 (1,1/1,2,3,3)	6.40			Weathered MARL
		8.20		N=50 (11,9/50 for 210mm)	8.20			MARL
					8.60			End of borehole at 8.60 m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

Annex B
Groundwater Test Results

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-25705

03-Feb-15

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

Our Reference 15-25705

Client Reference 12976

Contract Title John Street

Description 6 Water samples.

Date Received 28-Jan-15

Date Started 28-Jan-15

Date Completed 03-Feb-15

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 15-25705
Client Ref 12976
Contract Title John Street

				Lab No	759677	759678	759679	759680	759681	759682
				Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
				Depth						
				Other ID						
				Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
				Sampling Date	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15
				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	1.6	0.74	0.56	0.88	0.57	0.61
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.04	0.04	< 0.03	< 0.03	< 0.03	0.08
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	6.5	6.0	1.8	6.1	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.1	3.8	1.1	0.7	1.7	2.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.16	1.5	< 0.09	< 0.09	< 0.09	< 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	1.5	< 0.5	0.6	0.6	< 0.5	5.3
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.27	5.7	2.8	2.3	6.8	5.5
Zinc, Dissolved	DETSC 2306	1.25	ug/l	24.8	72.6	21.8	19.2	12.8	394
Inorganics										
Conductivity	DETSC 2009	1	uS/cm	664	690	635	798	991	2020
pH	DETSC 2008			9.2	8.7	8.6	8.5	8.4	8.1
Total Biochemical Oxygen Demand	DETSC 2031	1	mg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Chemical Oxygen Demand	DETSC 2032	10	mg/l	< 10	< 10	< 10	< 10	< 10	16
Cyanide total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Hardness	DETSC 2303	0.1	mg/l	139	253	211	178	380	973
Sulphate as SO4	DETSC 2055	0.1	mg/l	87	110	47	76	310	1000
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	42	18
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	96	64
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	140	82
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	24	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	11	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	35	< 10
TPH Ali/Aro	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	170	82
EPH (C10-C40)	DETSC 3311	10	ug/l	32	< 10	68	21	38	130
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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

Summary of Chemical Analysis
Water Samples

Our Ref 15-25705
Client Ref 12976
Contract Title John Street

			Lab No	759677	759678	759679	759680	759681	759682
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PAHs									
Naphthalene	DETS 074*	0.01	ug/l	0.07	< 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
Acenaphthene	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
Phenanthrene	DETS 074*	0.01	ug/l	< 0.01	0.03	< 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
Fluoranthene	DETS 074*	0.01	ug/l	< 0.01	0.06	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETS 074*	0.01	ug/l	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETS 074*	0.01	ug/l	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETS 074*	0.01	ug/l	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETS 074*	0.01	ug/l	< 0.01	0.02	< 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
Dibenzo(a,h)anthracene	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
PAH	DETS 074*	0.2	ug/l	< 0.20	0.29	< 0.20	< 0.20	< 0.20	< 0.20
PCBs									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Phenols									
Phenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Chloro-3-methylphenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dichlorophenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dimethylphenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
p-cresol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dimethylphenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dichlorophenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2,4,6-Trichlorophenol	DETSC 3452*	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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

Summary of Chemical Analysis
Water Samples

Our Ref 15-25705
Client Ref 12976
Contract Title John Street

			Lab No	759677	759678	759679	759680	759681	759682
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
VOCs									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

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

Summary of Chemical Analysis
Water Samples

Our Ref 15-25705
Client Ref 12976
Contract Title John Street

			Lab No	759677	759678	759679	759680	759681	759682
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
SVOCs									
Aniline	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dinitrotoluene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibenzofuran	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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

Summary of Chemical Analysis
Water Samples

Our Ref 15-25705
Client Ref 12976
Contract Title John Street

			Lab No	759677	759678	759679	759680	759681	759682
			Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
			Depth						
			Other ID						
			Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
			Sampling Date	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15	27/01/15
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Hexachlorobenzene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ether	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETS 071*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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

Information in Support of the Analytical Results

Our Ref 15-25705
Client Ref 12976
Contract John Street

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
759677	BH1 WATER	27/01/15	GB 1L x2, GV, PB 1L		
759678	BH2 WATER	27/01/15	GB 1L x2, GV, PB 1L		
759679	BH3 WATER	27/01/15	GB 1L x2, GV, PB 1L		
759680	BH4 WATER	27/01/15	GB 1L x2, GV, PB 1L		
759681	BH5 WATER	27/01/15	GB 1L x2, GV, PB 1L		
759682	BH6 WATER	27/01/15	GB 1L x2, GV, PB 1L		

Key: G-Glass P-Plastic 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

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	19-13485-1
Initial Date of Issue:	29-Apr-2019
Client	Terra Firma (Wales) Ltd
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	ruth@terrafirmawales.co.uk
Project	John Street

Quotation No.:		**Date Received:**	18-Apr-2019
Order No.:	12976RH	**Date Instructed:**	18-Apr-2019
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	26-Apr-2019
Date Approved:	29-Apr-2019		

Approved By:

Details: Robert Monk, Technical Manager

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-13485	19-13485	19-13485	19-13485	19-13485
Quotation No.:			**Chemtest Sample ID.:**		813678	813679	813680	813681	813682
Order No.: 12976RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH	U	1010		N/A	7.4	8.0	7.9	8.0	8.2
Electrical Conductivity	U	1020	µS/cm	1.0	640	470	1800	1900	1900
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chemical Oxygen Demand	U	1100	mg O2/l	10	13	< 10	< 10	< 10	< 10
Sulphate	U	1220	mg/l	1.0	90	58	890	920	920
Cyanide (Total) Low-Level	N	1300	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Sulphide	U	1325	mg/l	0.050	< 0.050	0.051	< 0.050	< 0.050	0.054
Hardness	N	1415	mg/l	1.0	260	140	920	990	970
Arsenic (Dissolved)	U	1450	µg/l	1.0	< 1.0	1.4	< 1.0	< 1.0	1.1
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	1.7	< 1.0	< 1.0	1.5	2.6
Copper (Dissolved)	U	1450	µg/l	1.0	3.0	< 1.0	1.5	1.1	1.4
Nickel (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	2.1	< 1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	1.1	< 1.0	2.8	3.0	3.6
Zinc (Dissolved)	U	1450	µg/l	1.0	6.5	< 1.0	20	23	25
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chromium (Trivalent)	N	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	8.8	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	8.8	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-13485	19-13485	19-13485	19-13485	19-13485
Quotation No.:			**Chemtest Sample ID.:**		813678	813679	813680	813681	813682
Order No.: 12976RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Chloromethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	N	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloromethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m & p-Xylene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tribromomethane	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromobenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-13485	19-13485	19-13485	19-13485	19-13485
Quotation No.:			**Chemtest Sample ID.:**		813678	813679	813680	813681	813682
Order No.: 12976RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
2-Chlorotoluene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chlorotoluene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
N-Butylbenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-13485	19-13485	19-13485	19-13485	19-13485
Quotation No.:			**Chemtest Sample ID.:**		813678	813679	813680	813681	813682
Order No.: 12976RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-13485	19-13485	19-13485	19-13485	19-13485
Quotation No.:			**Chemtest Sample ID.:**		813678	813679	813680	813681	813682
Order No.: 12976RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Of 6 PAH's	N	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
PCB 28	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Resorcinol	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Phenol	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Cresols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Xylenols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
1-Naphthol	N	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trimethylphenols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	19-14822-1
Initial Date of Issue:	09-May-2019
Client	Terra Firma (Wales) Ltd
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	ruth@terrafirmawales.co.uk
Project	John Street

Quotation No.:		**Date Received:**	02-May-2019
Order No.:	12966/W3/RH	**Date Instructed:**	02-May-2019
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	09-May-2019
Date Approved:	09-May-2019		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-14822	19-14822	19-14822	19-14822	19-14822
Quotation No.:			**Chemtest Sample ID.:**		819425	819426	819427	819428	819429
Order No.: 12966/W3/RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH	U	1010		N/A	8.1	8.2	8.1	8.1	8.3
Electrical Conductivity	U	1020	µS/cm	1.0	720	660	1700	1900	950
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0	6.0	4.0	< 4.0	< 4.0	< 4.0
Chemical Oxygen Demand	U	1100	mg O2/l	10	10	< 10	19	< 10	< 10
Sulphate	U	1220	mg/l	1.0	53	70	810	150	840
Cyanide (Total) Low-Level	N	1300	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Sulphide	U	1325	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hardness	N	1415	mg/l	1.0	180	240	930	350	960
Arsenic (Dissolved)	U	1450	µg/l	1.0	2.0	< 1.0	2.3	1.1	2.4
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	1.6	20	1.4
Nickel (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	1.1	< 1.0	1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	3.9	1.5	4.0
Zinc (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	1.7	< 1.0	< 1.0
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chromium (Trivalent)	N	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-14822	19-14822	19-14822	19-14822	19-14822
Quotation No.:			**Chemtest Sample ID.:**		819425	819426	819427	819428	819429
Order No.: 12966/W3/RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-14822	19-14822	19-14822	19-14822	19-14822
Quotation No.:			**Chemtest Sample ID.:**		819425	819426	819427	819428	819429
Order No.: 12966/W3/RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-14822	19-14822	19-14822	19-14822	19-14822
Quotation No.:			**Chemtest Sample ID.:**		819425	819426	819427	819428	819429
Order No.: 12966/W3/RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Chemtest
The right chemistry to deliver results

Results - Water

Project: John Street

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		19-14822	19-14822	19-14822	19-14822	19-14822
Quotation No.:			**Chemtest Sample ID.:**		819425	819426	819427	819428	819429
Order No.: 12966/W3/RH			Client Sample Ref.:		BH1	BH3	BH4	BH5	BH6
			Client Sample ID.:		BH1	BH3	BH4	BH5	BH6
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019	29-Apr-2019
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Of 6 PAH's	N	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Phenol	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Cresols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Xylenols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
1-Naphthol	N	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Trimethylphenols	U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Chemtest
The right chemistry to deliver results

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com