

Ref J2899/14/E  
16<sup>th</sup> August 2016

Environmental  
Geotechnical  
Specialists



Barclay Firth,  
Ground Floor,  
Riverside Mills,  
Saddleworth Road,  
Elland,  
HX5 0RY.

**For the attention of Neil Hamilton**

Dear Neil,

Ref: Land off Hoyle Beck Close, Linthwaite.

Further to the validation letter for the above site (J2899/14/E) presented in August 2016, it is understood that the contaminated fill has been removed and replaced with clean material. In accordance with your instructions we have undertaken testing to validate that the site is now uncontaminated. This work is complete and we take pleasure in enclosing the results. The following describes the work undertaken, presents the data obtained and discusses the findings in association with the proposed development.

**Fieldworks**

A visit was made to site on the 7<sup>th</sup> September 2016 in order to obtain samples for contamination testing. Samples were taken from the front and rear gardens of plots 1 to 4. At the time of the visit, the material for the rear of plot 4 and for plot 5 was present in a stockpile. Therefore, three locations were selected around the stockpile and the material combined for subsequent chemical testing.

A second visit to site on the 15<sup>th</sup> September 2016 after the fill material had been placed. Five hand dug trial pits were excavated within selected landscaped areas and the locations are shown on the site plan, which is attached to this letter. All trial pits fully penetrated the imported fill to reveal the gravel capillary break. Soil samples were recovered from each trial pit and brought back to Rogers Geotechnical Services Laboratory to be logged in general accordance with BS5930: 2015, and full descriptions are given on the trial pit records, which are attached to this letter. In addition, photographs taken during the fieldworks are also attached, which illustrate the depth of the upper surface of the capillary break below ground level within each trial pit.

**Chemical Test Results**

A suite of testing was undertaken in samples taken across the site and the following testing regime was undertaken:

- Metals – Cd, Cr<sup>VI</sup>, Cu, Hg, Ni, Pb, V and Zn.
- Semi and Non-Metals - As, Se, and Free CN<sup>-</sup>.
- Polycyclic aromatic hydrocarbons (PAHs).



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Office 1 & 2 Barncliffe Business Park,  
Near Bank, Shelley, Huddersfield, HD8 8LU

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**Company No:** 5130864

- Petroleum hydrocarbons (TPHs).
- Others – pH, organic content and total SO<sub>4</sub><sup>2-</sup>.

A summary of contamination analysis is also attached to this letter.

### **Discussion of Results**

The results of the chemical testing have been compared to the ATRISK soil screening values (SSVs) for residential development with plant uptake, as compiled by WS Atkins plc. These values have been derived in such a way as to adhere to the principles within the revised CLEA model and include the most current release of the SGVs. A list of subscribers is provided within the website<sup>1</sup> and these include many local authorities.

A comparison of the results of the testing, together with the data given above, has been attached to this letter. These results indicate the following:

**Table 1: Summary of contaminated areas.**

Sample Reference	Depth (m)	Contaminants found to be exceeding SSVs (Residential with plant uptake)
Plot 1	0.15	PAH's [Pyrene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene].
Plot 2	0.25	None.
Plot 3	0..25	PAH's [Dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene].
Plot 4	0.25	PAH's [Dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene].
Stockpile	-	PAH's [Benzo(a)pyrene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(g,h,i)perylene].

Concentrations of chromium<sup>VI</sup>, selenium, free cyanide, phenols and petroleum hydrocarbons (aliphatic C5 to C35 and aromatic C5 to C16) were below the detection limits for the tests. Detectable levels of all other contaminants were recorded, but these fell below the associated ATRISK Soil Screening Values.

It should be appreciated that the soil screening values for the PAHs represents vapour saturation limits. The inhalation of vapour pathway contributes less than 10% of total exposure which is unlikely to significantly affect the combined assessment criterion<sup>2</sup>. In view of this, the ATRISK soil SSVs notes that the users may wish to consider using a combined assessment criterion given by CLEA if free product is not observed, the values for which are also provided on the summary of contamination analysis. In this case, no free product was observed, thus it is considered that the CLEA criteria should be adopted for the PAHs at this site. The results of the contaminants found to exceed these screening values are tabulated below:

<sup>1</sup> <http://www.atrisksoil.co.uk/pages/general/subscribers.asp>

<sup>2</sup> Ref: ATRISK soil, SSVs derived using CLEA v1.04 for 6% SOM, Residential with plant uptake land use, 14.12.09.

**Table 2: Summary of areas contaminated by PAHs.**

Sample Reference	Depth (m)	Contaminants found to be exceeding CLEA/C4SL criterion (Residential with plant uptake)
Plot 1	0.15	PAH's [Benzo(a)pyrene, dibenz(a,h)anthracene].
Plot 2	0.25	None.
Plot 3	0..25	None.
Plot 4	0.25	None.
Stockpile	-	None.

It should be appreciated that the Aktins ATRISK and CLEA soil screening criteria provide screening values that adhere to the principals of ensuring that contamination levels are kept to a concentrations where a minimal risk of harm may result. However, recent work by DEFRA has set about determining a set of screening criteria which assess whether a low risk of a harm present from contamination<sup>3</sup>. Whilst this is felt to reflect a more pragmatic approach to contamination risk assessment, it is still strongly precautionary.

As such, this criterion has determined Category 4 Screening Levels (C4SLs) with respect to a residential without home grown produce end-use<sup>[2]</sup>. It may be appreciated that a C4SL value is provided for benzo(a)pyrene, however, the recorded concentrations of this determinand for the sample taken from plot 1 exceeds the screening value of 5mg/kg. As such it is considered that the concentration of benzo(a)pyrene within the garden area of plot 1 pose an unacceptable level of risk to end-users.

On the basis of the information provided above, it is considered that only the garden area of plot 1 is contaminated by benzo(a)pyrene and dibenz(a,h)anthracene. The results for the testing taken for plots 2 to 5 indicate that these areas are suitable for the proposed residential with plant uptake end use.

## **Conclusions**

The results of the trial pitting have revealed that between 0.5m and 0.6m of imported fill is present over the granular capillary break. However, the chemical test results indicate the fill to be contaminated within the garden area of plot 1. Therefore, it is considered that the fill within this plot does not meet the requirements of the remediation objectives and is unsuitable for use at this site given the residential nature of the development. The imported fill used within the remaining plots are considered to be suitable for the proposed end use.

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<sup>3</sup> DEFRA, 2014. SP1010: *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document*.

<sup>[2]</sup> DEFRA, 2014. SP1010: *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document*; [Table pg 13] *Final Category 4 Screening Levels based on the risk management decisions outline above*.

## References

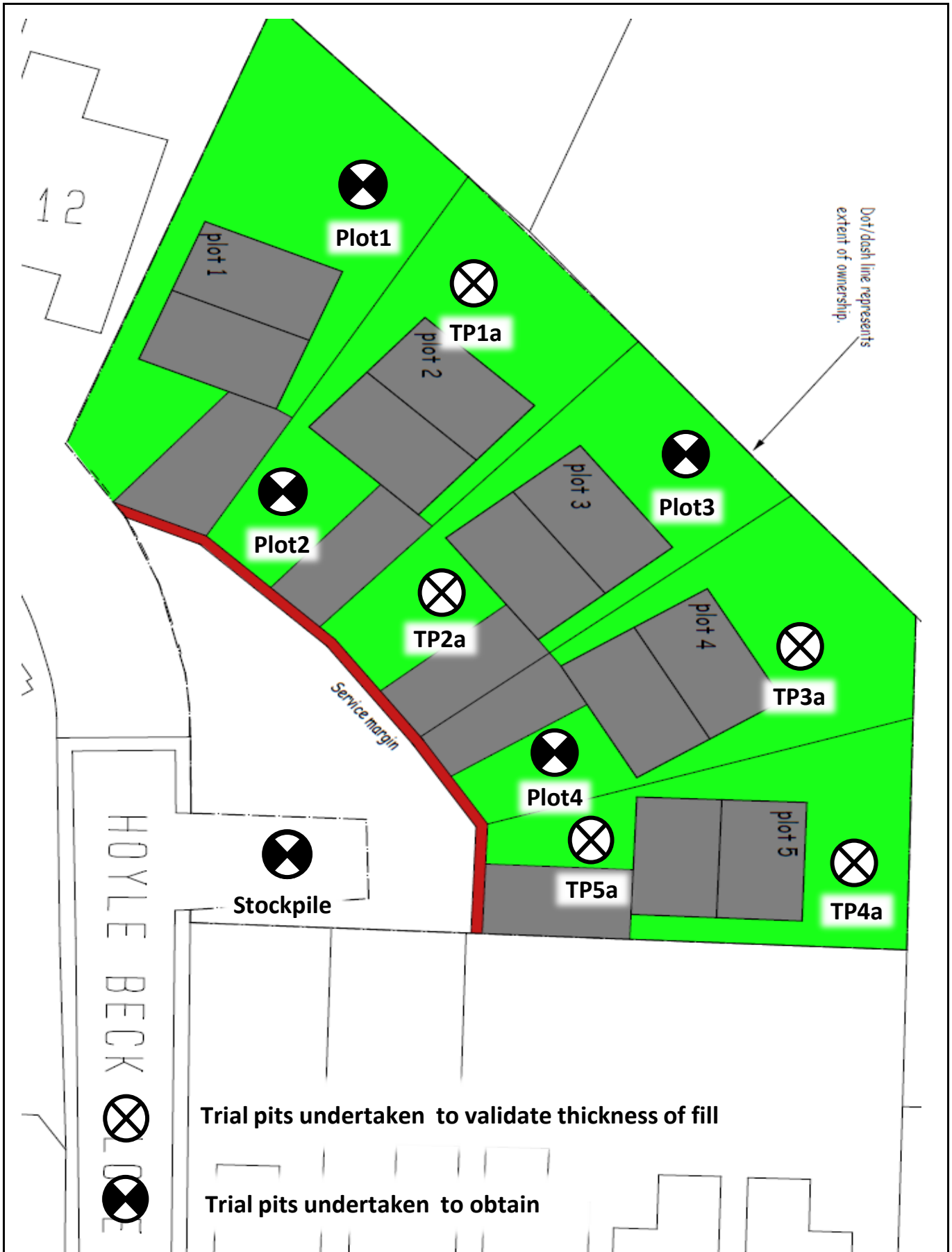
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – Final SC050021/SR2, *Human Health toxicological assessment of contaminants in soil*. Environment Agency, Bristol.
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – SC050021/SR3, *Updated technical background to the CLEA model*. Environment Agency, Bristol.
- WS Atkins plc, 2011, Soil Screening Values, Derived using CLEA v1.04 and January 2009 Guidance: SSVs derived using CLEA v1.04 for 6% SOM, Residential with home grown produce land use.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For Rogers Geotechnical Services Ltd,  
Yours sincerely,

I. Sakoor BEng  
Geotechnical Engineer

S.P. Rogers CEng, CGeol, MICE, MCIHT, FGS  
Technical Director



Title: **Investigation Location Plan**



**Rogers Geotechnical Services Ltd**

Site Name:  
**Hoyle Beck Close  
Linthwaite**

Job No:  
**J2889/14/E**





# Trial Pit Log

Trialpit No

**Plot2**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date 07/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):





Scale 1:25

Client: Barclay Firth

Depth 0.25

Logged IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.25	D		0.25		 Dark brown, clayey SILT with rootlets and occasional gravel. Gravel is sub-angular to sub-rounded, fine to coarse of sandstone.	
						----- End of pit at 0.25 m	

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**Plot3**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date 07/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):





Scale 1:25

Client: Barclay Firth

Depth 0.25

Logged IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.25	D		0.25		 Dark brown, clayey SILT with rootlets and occasional gravel. Gravel is sub-angular to sub-rounded, fine to coarse of sandstone.	
							End of pit at 0.25 m 

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**Plot4**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:Date  
07/09/2016


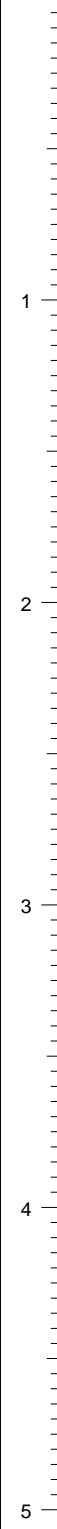
Location: Linthwaite, HD7 5RH

Dimensions (m):

Scale  
1:25

Client: Barclay Firth

Depth  
0.25Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.25	D		0.25		 Dark brown, clayey SILT with rootlets and occasional gravel. Gravel is sub-angular to sub-rounded, fine to coarse of sandstone.	
End of pit at 0.25 m							

Remarks:

Stability:





# Trial Pit Log

Trialpit No  
**Stockpile**  
Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No.  
J2889/14/E

Co-ords: -  
Level:

Date  
07/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):

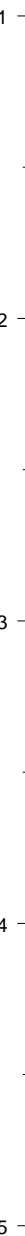
Scale  
1:25

Client: Barclay Firth

Depth

Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10		XXXXX	Dark brown, clayey SILT with rootlets and occasional gravel. Gravel is sub-angular to sub-rounded, fine to coarse of sandstone.



Remarks:  
  
Stability:





# Trial Pit Log

Trialpit No

**TP1a**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date  
15/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):

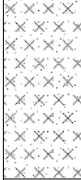



Scale  
1:25

Client: Barclay Firth

Depth  
0.60

Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.60		 Dark brown, clayey, sandy SILT with occasional gravel and rootlets.	 End of pit at 0.60 m

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**TP2a**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date  
15/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):

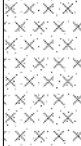
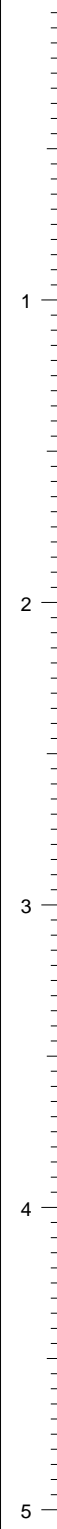


Scale  
1:25

Client: Barclay Firth

Depth  
0.50

Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.50		 Dark brown, clayey, sandy SILT with occasional gravel and rootlets.	
						----- End of pit at 0.50 m	

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**TP3a**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date  
15/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):

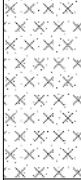



Scale  
1:25

Client: Barclay Firth

Depth  
0.60

Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.60		 Dark brown, clayey, sandy SILT with occasional gravel and rootlets.	
						End of pit at 0.60 m <hr style="border-top: 1px dashed black;"/>	

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**TP4a**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close


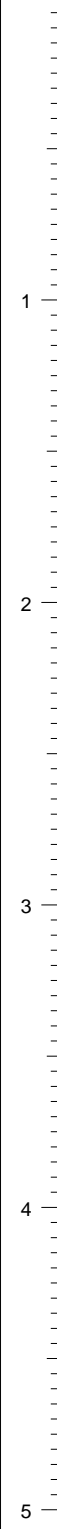
Project No.  
J2889/14/ECo-ords: -  
Level:Date  
15/09/2016

Location: Linthwaite, HD7 5RH

Dimensions  
(m):Scale  
1:25

Client: Barclay Firth

Depth  
0.65Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.65		 Dark brown, clayey, sandy SILT with occasional gravel and rootlets.	 1 2 3 4 5
						End of pit at 0.65 m	

Remarks:

Stability:





# Trial Pit Log

Trialpit No

**TP5a**

Sheet 1 of 1

Project Name: Land off Hoyle Beck Close

Project No. J2889/14/E

Co-ords: -  
Level:

Date  
15/09/2016

Location: Linthwaite, HD7 5RH

Dimensions (m):

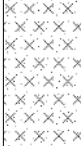
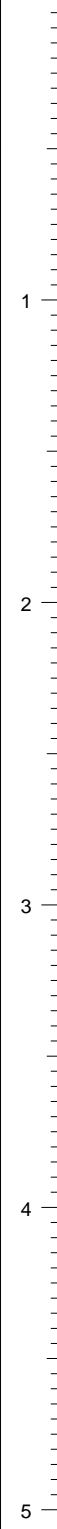


Scale  
1:25

Client: Barclay Firth

Depth  
0.50

Logged  
IMY

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.50		 Dark brown, clayey, sandy SILT with occasional gravel and rootlets.	
						----- End of pit at 0.50 m	

Remarks:

Stability:





**Rogers**  
**Geotechnical**  
**Services Ltd**

Project Name:

**Hoyle Beck Close, Linthwaite**

Project Number:

**J2889/14/E**



**Rogers**  
**Geotechnical**  
**Services Ltd**

Project Name:  
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**J2889/14/E**



**Rogers**  
**Geotechnical**  
**Services Ltd**

Project Name:  
**Hoyle Beck Close, Linthwaite**

Project Number:  
**J2889/14/E**



## Final Report

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**Report No.:** 16-21498-1

**Initial Date of Issue:** 14-Sep-2016

**Client:** Rogers Geotechnical Services Ltd

**Client Address:** Unit 4, Barncliffe Business Park  
Near Bank  
Shelley  
Huddersfield  
West Yorkshire  
HD8 8LU

**Contact(s):** Imran Sakoor

**Project:** J2889/14/E Hoyle Beck Close,  
Linthwaite

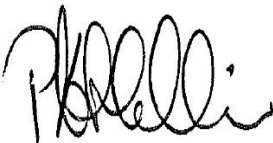
**Quotation No.:** **Date Received:** 08-Sep-2016

**Order No.:** 0916-15 **Date Instructed:** 08-Sep-2016

**No. of Samples:** 5

**Turnaround (Wkdays):** 5 **Results Due:** 14-Sep-2016

**Date Approved:** 14-Sep-2016

**Approved By:**  


**Details:** Phil Hellier, Project Director

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## Results - Soil

Client: Rogers Geotechnical Services Ltd	Chemtest Job No.:				16-21498	16-21498	16-21498	16-21498	16-21498
Quotation No.:	Chemtest Sample ID.:				348380	348381	348382	348383	348384
Order No.: 0916-15	Client Sample Ref.:				Plot 1	Plot 2	Plot 3	Plot 4	StK Pile 1
	Client Sample ID.:				D1	D1	D1	D1	D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.15	0.25	0.25	0.25	
	Date Sampled:				07-Sep-2016	07-Sep-2016	07-Sep-2016	07-Sep-2016	07-Sep-2016
Determinand	Accred.	SOP	Units	LOD					
Cadmium	M	2450	mg/kg	0.10	0.33	0.27	0.31	0.28	0.29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper	M	2450	mg/kg	0.50	29	36	34	24	21
Mercury	M	2450	mg/kg	0.10	0.13	0.15	0.12	0.13	0.11
Nickel	M	2450	mg/kg	0.50	21	21	22	17	17
Lead	M	2450	mg/kg	0.50	64	41	48	51	51
Zinc	M	2450	mg/kg	0.50	88	73	77	67	73
Vanadium	U	2450	mg/kg	5.0	17	21	19	16	15
Arsenic	M	2450	mg/kg	1.0	9.8	9.3	11	10	7.4
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Naphthalene	M	2700	mg/kg	0.10	0.47	0.45	< 0.10	0.31	0.33
Acenaphthylene	M	2700	mg/kg	0.10	0.22	< 0.10	< 0.10	0.12	0.20
Acenaphthene	M	2700	mg/kg	0.10	0.77	< 0.10	< 0.10	< 0.10	0.32
Fluorene	M	2700	mg/kg	0.10	0.63	< 0.10	< 0.10	< 0.10	0.22
Phenanthrene	M	2700	mg/kg	0.10	4.9	0.31	0.32	0.34	2.4
Anthracene	M	2700	mg/kg	0.10	2.3	< 0.10	< 0.10	< 0.10	0.86
Fluoranthene	M	2700	mg/kg	0.10	20	0.67	0.77	1.0	4.2
Pyrene	M	2700	mg/kg	0.10	21	0.80	0.85	1.2	4.1
Benzo[a]anthracene	M	2700	mg/kg	0.10	8.1	0.35	0.47	0.59	1.9
Chrysene	M	2700	mg/kg	0.10	9.2	0.81	0.85	1.0	2.4
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	8.9	0.81	0.70	0.86	2.4
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	3.7	0.18	0.23	0.31	0.88
Benzo[a]pyrene	M	2700	mg/kg	0.10	7.2	0.43	0.63	0.70	2.2
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	5.2	< 0.10	0.57	0.97	1.6
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	1.6	< 0.10	0.31	0.31	0.41
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	7.8	< 0.10	2.2	1.0	2.8
Total Of 16 PAH's	M	2700	mg/kg	2.0	100	4.8	7.9	8.7	27
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	M	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

## Results - Soil

Client: Rogers Geotechnical Services Ltd	Chemtest Job No.:				16-21498	16-21498	16-21498	16-21498	16-21498
Quotation No.:	Chemtest Sample ID.:				348380	348381	348382	348383	348384
Order No.: 0916-15	Client Sample Ref.:				Plot 1	Plot 2	Plot 3	Plot 4	StK Pile 1
	Client Sample ID.:				D1	D1	D1	D1	D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.15	0.25	0.25	0.25	
	Date Sampled:				07-Sep-2016	07-Sep-2016	07-Sep-2016	07-Sep-2016	07-Sep-2016
Determinand	Accred.	SOP	Units	LOD					
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	M	2680	mg/kg	1.0	4.2	< 1.0	20	6.1	9.7
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	17	< 1.0	22	11	16
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	M	2680	mg/kg	5.0	21	< 5.0	42	17	26
Total Petroleum Hydrocarbons	M	2680	mg/kg	10	21	< 10	42	17	26
pH	M	2010		N/A	8.1	9.0	8.9	8.3	8.4
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.23	0.21	0.15	0.13	0.098
Moisture	N	2030	%	0.020	12	9.1	12	9.8	12
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay	Clay
Sulphate (Total)	M	2430	%	0.010	0.13	0.15	0.15	0.14	0.11
Organic Matter	M	2625	%	0.40	2.4	2.9	2.4	3.8	3.1

## **Report Information**

### **Key**

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- 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 our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

### **Sample Deviation Codes**

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- 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

### **Sample Retention and Disposal**

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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.co.uk](mailto:customerservices@chemtest.co.uk)

# Rogers Geotechnical Services Ltd.

## SUMMARY OF CONTAMINATION ANALYSIS - including Atkins ATRISK SSVs 2014

Client: Barclay Firth  
Site: Hoyle Beck Close, Linthwaite

Job Number: J2889/14/E  
Date: 14/09/2016

Tox Data Report No.	Compound	Range of Values Found (mg/kg)		Residential with Homegrown Produce Landuse (mg/kg)		Reference
		Min	Max			
<i>Metals</i>						
3	Cadmium	0.27	0.33	22		B
4	Chromium VI	<0.5	<0.5	21		B
	Copper	21	36	4020		A
7	Mercury	0.11	0.15	1.00		A
8	Nickel	17	22	130		A
	Lead	41	64	200		B
	Zinc	67	88	17200		A
	Vanadium	15	21	115		A
<i>Semi and Non Metals</i>						
1	Arsenic	7.4	11	37		B
10	Selenium	<0.2	<0.2	350		A
	Free Cyanide	<0.5	<0.5	34		A
9	Phenols (total)	<0.3	<0.3	420		A
<i>Poly Aromatic Hydrocarbons</i>						
				ATRISK	CLEA	
20	Napthalene	<0.1	0.47	8.71		A
	Acenaphthene	<0.1	0.77	937	2130	A
	Fluorene	<0.1	0.63	746	1930	A
	Anthracene	<0.1	2.3	20.9	18300	A
	Fluoranthene	0.67	20	113	2160	A
	Pyrene	0.8	21	13.2	1550	A
	Benz(a)anthracene	0.35	8.1	8.54		A
2	Chrysene	0.81	9.2	2.64	927	A
2	Benzo(b)fluoranthene	0.7	8.9	7.29	9.86	A
2	Benzo(k)fluoranthene	0.18	3.7	4.12	100	A
2	Benzo(a)pyrene	0.43	7.7	0.998	5	A/B
2	Dibenz(a,h)anthracene	<0.1	1.6	0.0236	1	A*
2	Indeno(1,2,3-c,d)pyrene	<0.1	5.2	0.368	9.75	A
2	Benzo(g,h,i)perylene	<0.1	7.8	0.112	103	A
<i>Petroleum Hydrocarbons</i>						
	Aliphatic C5-C6	<1	<1	259		A
	Aliphatic C6-C8	<1	<1	769		A
	Aliphatic C8-C10	<1	<1	144		A
	Aliphatic C10-C12	<1	<1	297		A
	Aliphatic C12-C16	<1	<1	126		A
	Aliphatic C16-C35	<1	<1	145000		A
	Aromatic C5-C7 (Benzene)	<1	<1	0.87		B
	Aromatic C7-C8 (Toluene)	<1	<1	610		A
	Aromatic C8-C10	<1	<1	177		A
	Aromatic C10-C12	<1	<1	389		A
	Aromatic C12-C16	<1	<1	687		A
	Aromatic C16-C21	<1	20	804		A
	Aromatic C21-C35	<1	22	1220		A
<i>Others</i>						
	pH	8.1	9	-		-
	Organic Content (%)	2.4	3.8	-		-
	Soluble Sulphate (g/l)	0.098	0.23	-		-
	Total Sulphate (%)	0.11	0.15	-		-

A = WS ATKINS PLC, ATRISK SOIL SCREENING VALUES BASED ON 6% SOIL ORGANIC MATTER

For PAHs ATRISK assumes free product is available whilst CLEA assumes no free product

A\* Atrisk's SSV is lower than Chemtest's detectable limit for this compound.

B = CATAGORY 4 SCREENING LEVEL BASED ON 6% SOIL ORGANIC MATTER.