By Email

Our ref: 16-136.02L

Bill Bird
McCarthy & Stone Retirement Lifestyles Limited
Aspen House
Wykeham Road
Northminster Business Park
York
YO26 6QW

Arc Environmental Ltd
Solum House
Unit 1 Elliott Court
St Johns Road
Meadowfield
Durham
DH7 8PN

11th May 2017

Dear Bill,

Re: Proposed Retirement Apartments - Roundel Kitchens, Harton Centre, 52 Harton Lane, South Shields, Tyne & Wear – Addendum Ground Investigation Report

Following completion of the recent supplementary investigation works at the above site location, we have pleasure in providing you with the following documents;

- Borehole Location Plan
- Borehole Record Sheets (BH101 to BH103)
- Contamination Screening Results

1.0 Introduction: -

Arc Environmental Limited were commissioned by McCarthy & Stone Retirement Lifestyles Limited to undertake supplementary internal ground investigation works (outside working hours) at Roundel Kitchens, Harton Centre, 52 Harton Lane, South Shields, Tyne & Wear where it is proposed to demolish the existing structures and construct retirement apartments.

A Phase 1: Desk Top Study Report and intrusive investigation works (Phase 2: Ground Investigation Report) were undertaken by Arc Environmental Limited, although certain portions of the site were not accessible. Therefore, a programme of supplementary boreholes was designed to gain further site coverage in terms of the ground contamination risk assessment.

The information contained in this report is limited to the areas of the site as indicated on the Borehole Location Plan.

2.0 Ground Conditions: -

For an accurate description of the ground conditions encountered at the supplementary exploratory positions created by Arc Environmental Limited, reference should be made to the borehole record sheets attached. It should be noted that there is always the possibility of variation in the ground conditions around and between the borehole locations.

2.0 Ground Conditions (Cont'd): -

The single borehole (labelled BH101) positioned in the small corridor behind the kitchen area recorded thick reinforced concrete (0.30m thick) sitting directly onto natural stiff clay i.e. no made ground.

The two boreholes (BH102 & BH103) positioned in the long showroom corridor recorded thinner concrete c.0.12m to c.0.20m thick with no reinforcement overlying made ground to c.1.50m then natural stiff clay. There was no visual or olfactory evidence of significant contamination i.e. fuels, oils, asbestos containing materials, etc.

Samples of made ground recovered from BH102 & BH103 were forwarded to the laboratory for contamination screening.

3.0 Contamination Screening: -

Representative samples of the made ground were passed onto Chemtech Environmental of Stanley, Co. Durham, so that contamination screening could be carried out. These samples were screened using a standard generic contamination suite (based on the current CLEA SGV listed analytes with historical additions), which is used to assess typical made ground (disturbed natural strata mixed with anthropogenic debris) of an unknown source. Asbestos screening was also completed due to the nature of the made ground. In addition, considering the previous site history and use as Harton Laundry & Dye Works samples of made ground have also been targeted for a range of hydrocarbon and solvent screening. The catalogue of testing results can be found in the Chemtech Analytical Reports (ref nos. 64320) attached, and the total analysis carried out to date is summarised below:

- 2 no. soil samples screened using a Generic Soils Suite - based on the current CLEA SGV listed analytes with historical additions and which is used to assess typical made ground, comprising disturbed natural strata mixed with anthropogenic debris, of an unknown source (suite comprises; Arsenic, Cadmium, Chromium III, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Zinc & Cyanide.
- 2 no. soil samples screened for the presence of Asbestos.
- 2 no. soil samples screened for Speciated Polycyclic Aromatic Hydrocarbons (PAH's) – based on the current USEPA 16 PAH's.
- 2 no. soil samples screened for Speciated Total Petroleum Hydrocarbons (TPH's)
- 2 no. soil samples screened for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)
- 2 no. soil samples screened for Volatile Organic Compounds (VOC's)
- 2 no. soil samples screened for Semi-Volatile Organic Compounds (SVOC's)

These results have been used to carry out a supplementary Quantitative Human Health Risk Assessment for the ground contamination present, and are discussed in Section 4.0 on the following pages.

T: 0191 378 6380
F: 0191 378 0494
E: admin@arc-environmental.com
W: www.arc-environmental.com
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4.0 Supplementary Ground Contamination Risk Assessment: -

Table 1

Analyte	Critical Conc. (C_C) mg/kg	No. of Samples Screened	Max. Conc. (C_M) recorded mg/kg	Has C_M exceeded C_C	No. of Samples >C_C
Arsenic	40(1)	2	17	NO	0
Cadmium	85(1)	2	0.6	NO	0
Chromium III	910(1)	2	93	NO	0
Chromium VI	6(1)	2	<1	NO	0
Copper	7100(1)	2	248	NO	0
Lead	310(2)	2	150	NO	0
Mercury	56(1)	2	<0.5	NO	0
Nickel	180(1)	2	37	NO	0
Selenium	430(1)	2	1.9	NO	0
Zinc	40000(1)	2	843	NO	0
Cyanide	34(3)	2	<1	NO	0
Asbestos	Presence	2	NAD	~	~
Acenaphthene	6000(1)	2	0.24	NO	0
Acenaphthylene	6000(1)	2	<0.01	NO	0
Anthracene	37000(1)	2	0.56	NO	0
Benzo(a)anthracene	15(1)	2	5.99	NO	0
Benzo(a)pyrene	3.2(1)	2	6.48	YES	1 (BH102)
Benzo(b)fluoranthene	4.0(1)	2	7.44	NO	0
Benzo(ghi)perylene	360(1)	2	3.60	NO	0
Benzo(k)fluoranthene	110(1)	2	3.72	NO	0
Chrysene	32(1)	2	6.1	NO	0
Dibenz(ah)anthracene	0.32(1)	2	1.2	YES	1 (BH102)
Fluoranthene	1600(1)	2	7.54	NO	0
Fluorene	4500(1)	2	0.12	NO	0
Indeno(123cd)pyrene	46(1)	2	3.95	NO	0
Naphthalene	13(1)	2	0.38	NO	0
Phenanthrene	1500(1)	2	3.51	NO	0
Pyrene	3800(1)	2	6.86	NO	0
MTBE	220(2)	2	<0.02	NO	0
Benzene	1.4(1)	2	<0.01	NO	0
Toluene	3900(1)	2	<0.01	NO	0
Ethylbenzene	440(1)	2	<0.01	NO	0
m&p-Xylene	430(1)	2	<0.02	NO	0
o-Xylene	480(1)	2	<0.01	NO	0
TPH C5-C7	160(1)	2	0.2	NO	0
TPH C7-C8	530(1)	2	6.9	NO	0
TPH C8-C10	150(1)	2	<0.1	NO	0
TPH C10-C12	380(1)	2	<4	NO	0
TPH C12-C16	660(1)	2	10	NO	0
TPH C16-C21	930(1)	2	8	NO	0
TPH C21-C35	1700(1)	2	92	NO	0
TPH C35-EC44	1700(1)	2	51	NO	0
Cis-1,2-Dichloroethene	0.39(1)	2	1.06	YES	1(BH102)
Trichloroethene	0.08(1)	2	0.38	YES	1(BH102)
Tetrachloroethene	0.92(1)	2	18.32	YES	1(BH102)
2-Methylnaphthalene	240(2)	2	0.3	NO	0
Dibenzofuran	73(2)	2	0.4	NO	0

(1) = CL:AIRE GAC (Residential with home grown produce – 6% SOM) (most conservative Aliphatic or Aromatic fraction), (2) = USEPA Region 9 PRG (3) = N/A therefore use S4UL for Benzene, **Bold** = Elevated result. It should be noted that only those VOC's and SVOC's recorded above analytical detection limit have been assessed.

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4.0 Supplementary Ground Contamination Risk Assessment (Cont'd): -

- The maximum concentration (C_M) values for Benzo(a)pyrene, Dibenz(ah)anthracene (PAH's), Cis-1,2-Dichloroethene, Trichloroethene and Tetrachloroethene (VOC's) exceed their chosen critical concentration (C_C) values for this site.
- None of the C_M values for any of the remaining generic analytes, speciated PAH, speciated TPH's, VOC's or SVOC's exceed their chosen critical concentration (C_C) values for this site.
- Based on these results the site appears to have been locally impacted by solvent contamination and subsequently protection measures will be required, to protect the future end users

5.0 Conclusions: -

From the results of the supplementary contamination screening, there was evidence of some minor ground contamination being present on this site and, as previous, there will be a requirement for the provision of a Remediation Strategy and subsequent Validation works as discussed in the main Phase 2: Ground Investigation Report. The anticipated remediation works are briefly listed as follows: -

- Demolition of the existing commercial buildings.
- Removal of the floor slabs with a 'watching brief'.
- Excavation and removal of UST's and testing of surrounding soils.
- Excavation and removal of obvious contamination 'hot spots' (if present).
- Implementation of ground vapour protection measures, incorporating a hydrocarbon and volatile vapour resistant membrane.
- A DQRA may be required to confirm that the provision of a vapour resistant membrane will negate the risks associated with the presence of elevated volatiles. Reference should be made to BS8485:2015: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings and BRE 414: 2001 – Protective Measures for Housing on Gas Contaminated Land, for design details and specifications.
- Provision of a minimum 0.60m of clean cover in areas of soft landscaping and communal garden areas including a no-dig marker layer (i.e. 0.30m of basal compact stone or high visibility geotextile).

All remediation works should be validated by a suitably qualified and experienced Geo-Environmental Engineer to ensure all works are being completed in strict accordance with an agreed remediation strategy/statement, and once all the remediation works have been completed, the final Validation Report can be issued.

We trust the contents of this report are to your satisfaction and if you require any further information or clarification please do not hesitate to contact us.

Yours sincerely,

J.P. Ditc

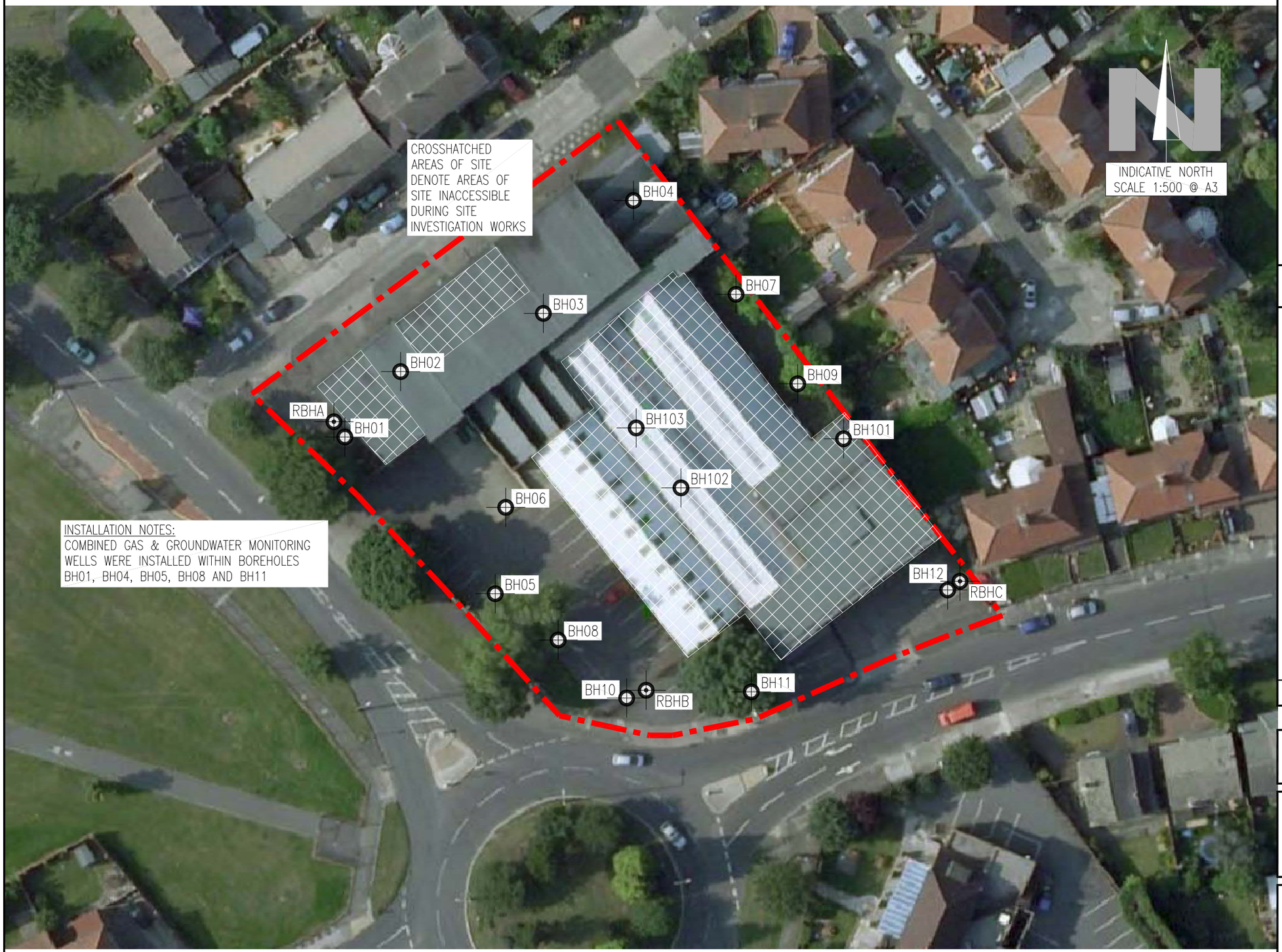
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For and on behalf of Arc Environmental Ltd
John Ditchburn *BEng (Hons) CSci MIEnvSc FGS*
Associate Director

T: 0191 378 6380
F: 0191 378 0494
E: admin@arc-environmental.com
W: www.arc-environmental.com
Registered in England No. 05539784

Borehole Location Plan

T: 0191 378 6380
F: 0191 378 0494
E: admin@arc-environmental.com
W: www.arc-environmental.com
Registered in England No. 05539784



ARC ENVIRONMENTAL LTD
Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
Fax: (0191) 378 0494
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
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LEGEND	
	APPROXIMATE SITE BOUNDARY
	WINDOWLESS SAMPLING BOREHOLE POSITION
	ROTARY BOREHOLE LOCATION

rev.	date	amendments	drawn	chckd

Client:
McCARTHY & STONE (RETIREMENT LIFESTYLES LTD)

Project Title:
Proposed CAT II Accommodation
Harton Centre, 52 Harton Lane
South Shields, Tyne & Wear, NE34 0EE

Drawing Title:
Borehole Location Plan

Scale at A3:	Date:	Drawn by:	Approved by:
1:500 @ A3	13.04.16	P.D	J.P.D

Job Ref:	Drg no:	Rev:
16-136	–	–

Borehole Record Sheets (BH101 to BH103)

T: 0191 378 6380
F: 0191 378 0494
E: admin@arc-environmental.com
W: www.arc-environmental.com
Registered in England No. 05539784

Solum House, Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham, DH7 8PN
Telephone: 01913786380

BOREHOLE LOG

Project				BOREHOLE No
Harton Lane, South Shields				**BH101**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
16-136	08-04-17			
Contractor				Sheet
Arc Environmental Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.04	Concrete screed (MADE GROUND)		
						0.30	Reinforced concrete with 8mm dia. rebar at 0.08m, 6mm dia. rebar at 0.185m and 8mm dia rebar at 0.22m. No DPM (MADE GROUND)		
0.40	J/B					(0.50)	Stiff dark brown/grey slightly sandy slightly gravelly CLAY. Gravel comprises fine to coarse sandstone (GLACIAL TILL - PELAW CLAY MEMBER)		
0.80	J/B					0.80			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	WATER OBSERVATIONS: BH remained dry

All dimensions in metres Scale 1:37.5	Client McCarthy & Stone	Method/ Plant Used Dynamic Sampling	Logged By JPD

AGS3 UK BH LOGS A TO K.GPJ AGS3_ALL.GDT 16/5/17

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BOREHOLE LOG

Project				BOREHOLE No
Harton Lane, South Shields				**BH102**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
16-136	08-04-17			
Contractor				Sheet
Arc Environmental Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.03	Concrete screed (MADE GROUND)		
						0.20	Concrete. No steel reinforcement noted. No DPM (MADE GROUND)		
						0.30			
0.40	J/B					0.50	Brick and sandstone rubble (MADE GROUND)		
							Soft and firm brown and grey gravelly clay with some brick fragments (MADE GROUND)		
							Soft dark grey very sandy clay. Slight organic / 'peaty' odour (MADE GROUND)		
1.00	J/B					(1.05)			
1.20	V	36kN/m^2							
						1.55			
1.50	B						Stiff (high strength) dark brown/grey slightly sandy slightly gravelly CLAY. Gravel comprises fine to coarse sandstone (GLACIAL TILL - PELAW CLAY MEMBER)		
1.50	V	28kN/m^2							
2.00	B					(0.92)			
2.00	V	>120kN/m^2							
						2.47			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER OBSERVATIONS: BH remained dry

All dimensions in metres Scale 1:37.5	Client McCarthy & Stone	Method/ Plant Used Dynamic Sampling	Logged By JPD

AGS3 UK BH LOGS A TO K.GPJ AGS3_ALL.GDT 16/5/17

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BOREHOLE LOG

Project				BOREHOLE No
Harton Lane, South Shields				**BH103**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
16-136	08-04-17			
Contractor				Sheet
Arc Environmental Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.03	Concrete screed (MADE GROUND)		
						0.12	Concrete. No steel reinforcement noted. No DPM (MADE GROUND)		
0.30	J/B					0.30			
						0.40	Brick, sandstone and slate tile rubble (MADE GROUND)		
0.60	J/B					(0.40)	Soft dark grey gravelly clay with some brick fragments (MADE GROUND)		
						0.80			
0.90	J/B						Firm brown sandy gravelly clay with some fine brick fragments (MADE GROUND)		
						(0.70)	Soft dark grey very sandy clay with occasional fine brick and pottery fragments. Slight organic / 'peaty' odour (MADE GROUND)		
						1.50			
1.60	B						Firm light brown and grey slightly sandy CLAY (GLACIAL TILL - PELAW CLAY MEMBER)		
1.60	V	62kN/m²				1.75			
2.00	V	110kN/m²				(0.75)	Stiff (high strength) dark brown/grey slightly sandy slightly gravelly CLAY. Gravel comprises fine to coarse sandstone (GLACIAL TILL - PELAW CLAY MEMBER)		
						2.50			
2.50	B								
2.50	V	>120kN/m²							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER OBSERVATIONS: BH remained dry

All dimensions in metres Scale 1:37.5	Client McCarthy & Stone	Method/ Plant Used Dynamic Sampling	Logged By JPD

AGS3 UK BH LOGS A TO K.GPJ AGS3_ALL.GDT 16/5/17

Laboratory Screening Results

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F: 0191 378 0494
E: admin@arc-environmental.com
W: www.arc-environmental.com
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ANALYTICAL TEST REPORT

Contract no:	64320
Contract name:	Harton Lane, South Shields
Client reference:	16-136
Clients name:	ARC Environmental
Clients address:	Solum House, Unit 1 Elliott Court St Johns Road Meadowfield DH7 8PN
Samples received:	11 April 2017
Analysis started:	11 April 2017
Analysis completed	20 April 2017
Report issued:	20 April 2017

Notes:

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key:

U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:

James Spittle
Customer Services Team Leader

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
64320-1	BH102	0.40	Clay	-	-	24.7
64320-2	BH103	0.60	Clay	-	-	14.7

Chemtech Environmental Limited

SOILS

Lab number			64320-1	64320-2
Sample id			BH102	BH103
Depth (m)			0.40	0.60
Date sampled			08/04/2017	08/04/2017
Test	Method	Units		
Arsenic (total)	CE127 M	mg/kg As	17	9.0
Cadmium (total)	CE127 M	mg/kg Cd	0.6	0.2
Chromium (total)	CE127 M	mg/kg Cr	93	92
Chromium (III)	-	mg/kg CrIII	93	92
Chromium (VI)	CE146	mg/kg CrVI	<1	<1
Copper (total)	CE127 M	mg/kg Cu	248	40
Lead (total)	CE127 M	mg/kg Pb	150	39
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	37	33
Selenium (total)	CE127 M	mg/kg Se	1.9	1.4
Zinc (total)	CE127 M	mg/kg Zn	843	133
pH	CE004 M	units	8.3	8.2
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	159	193
Cyanide (free)	CE077	mg/kg CN	<1	<1
Total Organic Carbon (TOC)	CE072 M	% w/w C	4.49	1.19
TPH				
VPH (>C5-C7)	CE067	mg/kg	0.2	<0.1
VPH (>C7-C8)	CE067	mg/kg	6.9	0.6
VPH (>C8-C10)	CE067	mg/kg	<0.1	<0.1
EPH (>C10-C12)	CE033 M	mg/kg	<4	<4
EPH (>C12-C16)	CE033 M	mg/kg	10	<4
EPH (>C16-C21)	CE033 M	mg/kg	18	<4
EPH (>C21-C35)	CE033 M	mg/kg	92	12
EPH (>C35-C44)	CE033 M	mg/kg	51	<10
Volatiles				
MTBE	CE057 U	mg/kg	<0.02	<0.02
Benzene	CE057 U	mg/kg	<0.01	<0.01
Toluene	CE057 U	mg/kg	<0.01	<0.01
Ethylbenzene	CE057 U	mg/kg	<0.01	<0.01
m & p-Xylene	CE057 U	mg/kg	<0.02	<0.02
o-Xylene	CE057 U	mg/kg	<0.01	<0.01
Dichlorodifluoromethane	CE066	mg/kg	<0.01	<0.01
Chloromethane	CE066	mg/kg	<0.01	<0.01
Vinyl chloride	CE066	mg/kg	<0.01	<0.01
Bromomethane	CE066	mg/kg	<0.01	<0.01
Chloroethane	CE066	mg/kg	<0.01	<0.01
Trichlorofluoromethane	CE066	mg/kg	<0.01	<0.01
1,1-Dichloroethene	CE066	mg/kg	<0.01	<0.01
Cis-1,2-Dichloroethene	CE066	mg/kg	1.06	0.10
1,1-Dichloroethane	CE066	mg/kg	<0.01	<0.01
Trans-1,2-Dichloroethene	CE066	mg/kg	0.10	<0.01

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SOILS

Lab number			64320-1	64320-2
Sample id			BH102	BH103
Depth (m)			0.40	0.60
Date sampled			08/04/2017	08/04/2017
Test	Method	Units		
Chloroform	CE066	mg/kg	<0.01	<0.01
1,1,1-Trichloroethane	CE066	mg/kg	<0.01	<0.01
1,2-Dichloroethane	CE066	mg/kg	<0.01	<0.01
Carbon tetrachloride	CE066	mg/kg	<0.01	<0.01
Trichloroethene	CE066	mg/kg	0.38	0.05
1,3-Dichloropropane	CE066	mg/kg	<0.01	<0.01
Dibromomethane	CE066	mg/kg	<0.01	<0.01
Bromodichloromethane	CE066	mg/kg	<0.01	<0.01
1,1-Dichloro-1-propene	CE066	mg/kg	<0.01	<0.01
1,3-Dichloropropene	CE066	mg/kg	<0.01	<0.01
1,1,2-Trichloroethane	CE066	mg/kg	<0.01	<0.01
Dibromochloromethane	CE066	mg/kg	<0.01	<0.01
Tetrachloroethene	CE066	mg/kg	11.67	18.32
1,2-Dibromoethane	CE066	mg/kg	<0.01	<0.01
Chlorobenzene	CE066	mg/kg	<0.01	<0.01
1,1,1,2-Tetrachloroethane	CE066	mg/kg	<0.01	<0.01
Styrene	CE066	mg/kg	<0.01	<0.01
Tribromomethane	CE066	mg/kg	<0.01	<0.01
1,1,2,2-Tetrachloroethane	CE066	mg/kg	<0.01	<0.01
Isopropylbenzene	CE066	mg/kg	<0.01	<0.01
1,2,3-Trichloropropane	CE066	mg/kg	<0.01	<0.01
Bromobenzene	CE066	mg/kg	<0.01	<0.01
2-Chlorotoluene	CE066	mg/kg	<0.01	<0.01
Propylbenzene	CE066	mg/kg	<0.01	<0.01
4-Chlorotoluene	CE066	mg/kg	<0.01	<0.01
1,3,5-Trimethylbenzene	CE066	mg/kg	<0.01	<0.01
tert-Butylbenzene	CE066	mg/kg	<0.01	<0.01
1,2,4-Trimethylbenzene	CE066	mg/kg	<0.01	<0.01
1,3-Dichlorobenzene	CE066	mg/kg	<0.01	<0.01
sec-Butylbenzene	CE066	mg/kg	<0.01	<0.01
1,4-Dichlorobenzene	CE066	mg/kg	<0.01	<0.01
4-Isopropyltoluene	CE066	mg/kg	<0.01	<0.01
1,2-Dichlorobenzene	CE066	mg/kg	<0.01	<0.01
Butylbenzene	CE066	mg/kg	<0.01	<0.01
1,2-Dibromo-3-chloropropane	CE066	mg/kg	<0.01	<0.01
1,2,4-Trichlorobenzene	CE066	mg/kg	<0.01	<0.01
1,2,3-Trichlorobenzene	CE066	mg/kg	<0.01	<0.01
Hexachloro-1,3-butadiene	CE066	mg/kg	<0.01	<0.01
Semi-volatiles				
Naphthalene	CE087 M	mg/kg	0.38	<0.01
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01
Acenaphthene	CE087 M	mg/kg	0.24	<0.01

Chemtech Environmental Limited

SOILS

Lab number			64320-1	64320-2
Sample id			BH102	BH103
Depth (m)			0.40	0.60
Date sampled			08/04/2017	08/04/2017
Test	Method	Units		
Fluorene	CE087 U	mg/kg	0.12	<0.01
Phenanthrene	CE087 M	mg/kg	3.51	<0.02
Anthracene	CE087 U	mg/kg	0.56	<0.02
Fluoranthene	CE087 M	mg/kg	7.54	<0.02
Pyrene	CE087 M	mg/kg	6.86	<0.02
Benzo(a)anthracene	CE087 U	mg/kg	5.99	<0.02
Chrysene	CE087 M	mg/kg	6.10	<0.01
Benzo(b)fluoranthene	CE087 M	mg/kg	7.44	<0.02
Benzo(k)fluoranthene	CE087 M	mg/kg	3.72	<0.02
Benzo(a)pyrene	CE087 U	mg/kg	6.48	<0.02
Indeno(123cd)pyrene	CE087 M	mg/kg	3.95	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	1.20	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	3.60	<0.02
N-Nitrosodimethylamine	CE065	mg/kg	<0.1	<0.1
Phenol	CE065	mg/kg	<0.1	<0.1
Bis(2-chloroethyl)ether	CE065	mg/kg	<0.1	<0.1
2-Chlorophenol	CE065	mg/kg	<0.1	<0.1
1,3-Dichlorobenzene	CE065	mg/kg	<0.1	<0.1
1,4-Dichlorobenzene	CE065	mg/kg	<0.1	<0.1
2-Methylphenol	CE065	mg/kg	<0.1	<0.1
1,2-Dichlorobenzene	CE065	mg/kg	<0.1	<0.1
Bis(2-chloroisopropyl)ether	CE065	mg/kg	<0.1	<0.1
4-Methylphenol	CE065	mg/kg	<0.1	<0.1
N-Nitrosodi-n-propylamine	CE065	mg/kg	<0.1	<0.1
Hexachloroethane	CE065	mg/kg	<0.1	<0.1
Nitrobenzene	CE065	mg/kg	<0.1	<0.1
Isophorone	CE065	mg/kg	<0.1	<0.1
2,4-Dimethylphenol	CE065	mg/kg	<0.1	<0.1
2-Nitrophenol	CE065	mg/kg	<0.1	<0.1
Bis(2-chloroethoxy)methane	CE065	mg/kg	<0.1	<0.1
2,4-Dichlorophenol	CE065	mg/kg	<0.1	<0.1
1,2,4-Trichlorobenzene	CE065	mg/kg	<0.1	<0.1
4-Chloroaniline	CE065	mg/kg	<0.1	<0.1
Hexachlorobutadiene	CE065	mg/kg	<0.1	<0.1
4-Chloro-3-methylphenol	CE065	mg/kg	<0.1	<0.1
2-Methylnaphthalene	CE065	mg/kg	0.3	<0.1
Hexachlorocyclopentadiene	CE065	mg/kg	<0.1	<0.1
2,4,6-Trichlorophenol	CE065	mg/kg	<0.1	<0.1
2,4,5-Trichlorophenol	CE065	mg/kg	<0.1	<0.1
2-Chloronaphthalene	CE065	mg/kg	<0.1	<0.1
2-Nitroaniline	CE065	mg/kg	<0.1	<0.1

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Lab number			64320-1	64320-2
Sample id			BH102	BH103
Depth (m)			0.40	0.60
Date sampled			08/04/2017	08/04/2017
Test	Method	Units		
Dimethyl phthalate	CE065	mg/kg	<0.1	<0.1
2,6-Dinitrotoluene	CE065	mg/kg	<0.1	<0.1
3-Nitroaniline	CE065	mg/kg	<0.1	<0.1
2,4-Dinitrophenol	CE065	mg/kg	<0.1	<0.1
4-Nitrophenol	CE065	mg/kg	<0.1	<0.1
2,4-Dinitrotoluene	CE065	mg/kg	<0.1	<0.1
Dibenzofuran	CE065	mg/kg	0.4	<0.1
Diethyl phthalate	CE065	mg/kg	<0.1	<0.1
4-Chlorophenylphenyl ether	CE065	mg/kg	<0.1	<0.1
4-Nitroaniline	CE065	mg/kg	<0.1	<0.1
2-Methyl-4,6-dinitrophenol	CE065	mg/kg	<0.1	<0.1
Azobenzene	CE065	mg/kg	<0.1	<0.1
4-Bromophenylphenyl ether	CE065	mg/kg	<0.1	<0.1
Hexachlorobenzene	CE065	mg/kg	<0.1	<0.1
Pentachlorophenol	CE065	mg/kg	<0.1	<0.1
Carbazole	CE065	mg/kg	<0.1	<0.1
Di-n-butyl phthalate	CE065	mg/kg	<0.1	<0.1
Butylbenzyl phthalate	CE065	mg/kg	<0.1	<0.1
Bis(2-ethylhexyl)phthalate	CE065	mg/kg	<0.1	<0.1
Di-n-octyl phthalate	CE065	mg/kg	<0.1	<0.1
Subcontracted analysis				
Asbestos (qualitative)	$	-	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
-	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	Wet	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO_4
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE087	Acenaphthene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	Wet	U	0.01	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Naphthalene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE057	MTBE	Headspace GC-FID	Wet	U	0.02	mg/kg
CE057	Benzene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	Toluene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	Ethylbenzene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	m & p-Xylene	Headspace GC-FID	Wet	U	0.02	mg/kg
CE057	o-Xylene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE067	VPH (>C5-C7)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH (>C7-C8)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH (>C8-C10)	Headspace GC-FID	Wet		0.1	mg/kg
CE033	EPH (>C10-C12)	Solvent extraction, GC-FID	Wet	M	4	mg/kg
CE033	EPH (>C12-C16)	Solvent extraction, GC-FID	Wet	M	4	mg/kg
CE033	EPH (>C16-C21)	Solvent extraction, GC-FID	Wet	M	4	mg/kg

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE033	EPH (>C21-C35)	Solvent extraction, GC-FID	Wet	M	6	mg/kg
CE033	EPH (>C35-C44)	Solvent extraction, GC-FID	Wet	M	10	mg/kg
CE066	Volatile Organic Compounds	Headspace GC-MS	Wet		0.01	mg/kg
CE065	Semi-volatile Organic Compounds	Solvent extraction, GC-MS	Wet		0.1	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
64320-1	BH102	0.40	N	
64320-2	BH103	0.60	N	