GRM Development Solutions Ltd
Laurus House
First Avenue
Centrum 100
Burton upon Trent
Staffordshire
DE14 2WH

Tel: 01283 551 249
Web: www.grm-uk.com

Our Ref: GRM/P9119/Val.Let.12

Date: 4th November 2022

Kalel Broady
Bellway Homes Limited (West Midlands)
1 Centurion Court
Centurion Way
Wilnecote
Tamworth
Staffordshire
B77 5PN

By Email Only

Dear Kalel,

RE: Oakamoor Road, Cheadle – Garden Capping Validation Letter Plot 112

Further to your instructions, GRM Development Solutions Ltd (GRM) attended site on the 3rd November 2022 to validate the garden capping placed in the rear garden of Plot 112, and to undertake testing of both site-won topsoil and subsoil to confirm its suitability for use within the garden capping layer.

The remedial requirements, as set out in GRM's Remediation Method Statement (ref: GRM/P9119/RMS/F.4Rev B, dated April 2020) are to comprise:

- **Rear gardens within the Southern Area of the site:** a 600mm of clean soil capping layer comprising topsoil and subsoil.
- **Soft landscaping within the Southern Area of the site:** a 600mm clean soil capping layer comprising topsoil, subsoil, and a geotextile marker membrane at the base.
- **Northern Area of the site:** no remediation is necessary.

The Remediation Plan is presented in Appendix A.

The remediation strategy stated that whilst the topsoil and subsoil would be derived from site both soil types would still need to be chemically tested to confirm suitability for use.

Validation

GRM excavated one validation pit in the rear garden of Plot 112 to confirm the depth of the capping layer. A soil capping layer of at least 600mm in thickness was confirmed to be present. The Validation Pit Location Plan and Validation Photographs are shown in Appendix B.

Soil samples were previously taken of the site-won topsoil and subsoil from stockpiles of the same source placed in Plot 112 and sent for compliance chemical analysis. The results, when compared against GRM Tier 1 Assessment Criteria (TAC) for residential end-use with plant-uptake, show that all contaminants were below their respective threshold values. Copies of the chemical results (L22/02933/GRM - 22-26971 and L22/04072/GRM - 22-28522) and GRM TACs are enclosed for reference in Appendix C and D, respectively.

Therefore, it is considered that the site won soils are suitable for use as a capping layer in the gardens and soft landscaping areas.

Conclusion

According to the above information the remedial measures are considered to comply with the agreed Remediation Strategy at the time of attendance, and no further work is required.

I trust that the above is sufficient for your current purposes; however, should you require any further information please do not hesitate to contact us.

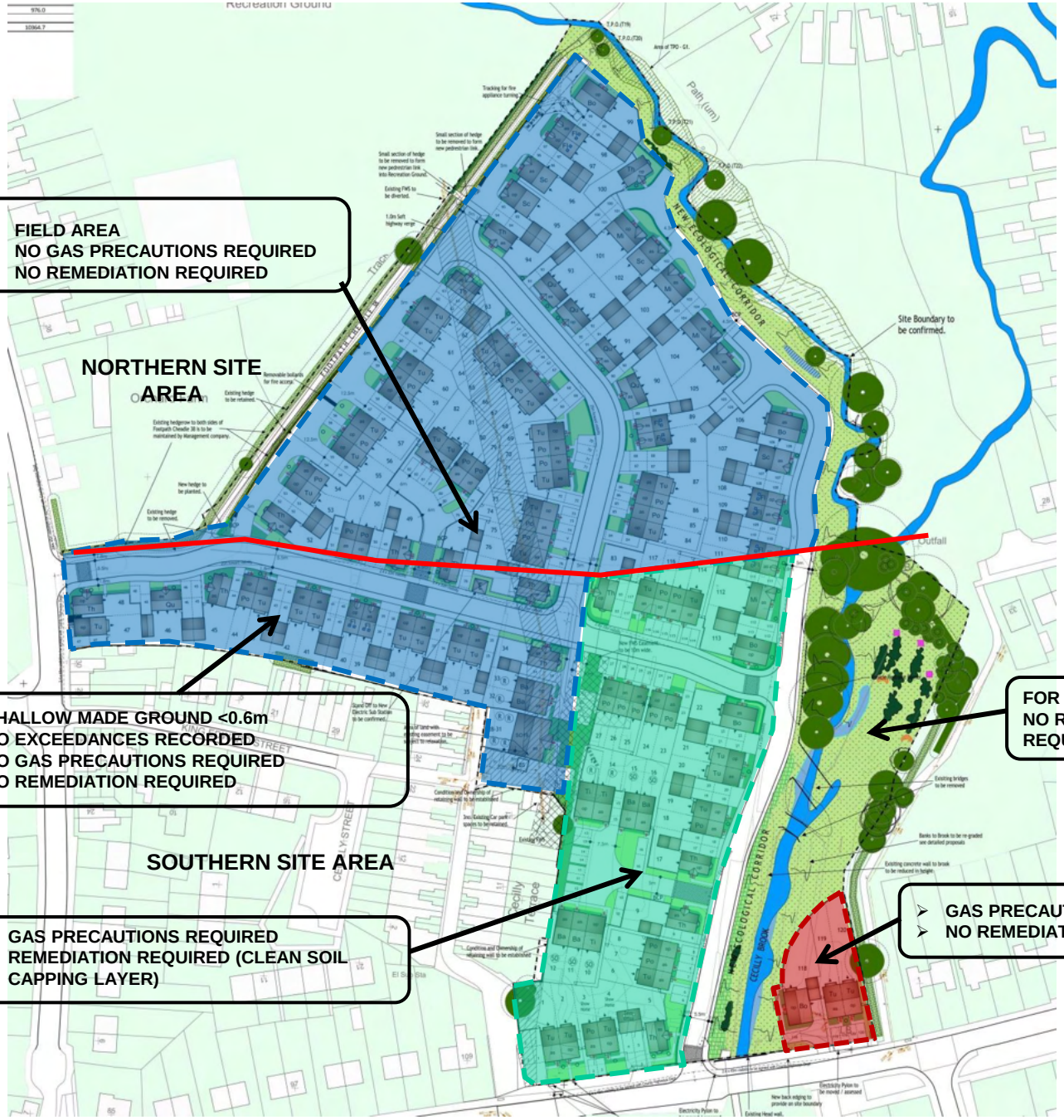
Yours sincerely,
for GRM Development Solutions Ltd

Sonia Singh
BSc (Hons) FGS
Geologist

Charlotte Mortimer
BSc (Hons) MIEnvSc
Senior Environmental Scientist

Enclosed:
Appendix A Remediation Plan
Appendix B Validation Pit Location Plan and Validation Photographs
Appendix C Topsoil Chemical Testing Results (L22/02933/GRM - 22-26971and L22/04072/GRM – 22-28522)
Appendix D GRM Tier 1 Assessment Criteria

APPENDIX A



- FIELD AREA
- NO GAS PRECAUTIONS REQUIRED
- NO REMEDIATION REQUIRED

- SHALLOW MADE GROUND <0.6m
- NO EXCEEDANCES RECORDED
- NO GAS PRECAUTIONS REQUIRED
- NO REMEDIATION REQUIRED

FOR POS AREA – NO REMEDIATION REQUIRED

- GAS PRECAUTIONS REQUIRED
- REMEDIATION REQUIRED (CLEAN SOIL CAPPING LAYER)

- GAS PRECAUTIONS REQUIRED
- NO REMEDIATION REQUIRED

DO NOT SCALE

NOTES:

GRM Development Solutions Ltd
Laurus House, First Ave, Centrum 100,
Burton-on-Trent, Staffordshire
Tel: 01283 551 249 Fax: 01283 211 968
mail@grm-uk.com www.grm-uk.com

CLIENT:
Bellway Homes West Midlands

PROJECT:
Land off Oakamoor Road, Cheadle

TITLE:
Remediation Plan

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN : SJ	DATE: June 2020
PROJECT No: P9119 01	DRAWING No:

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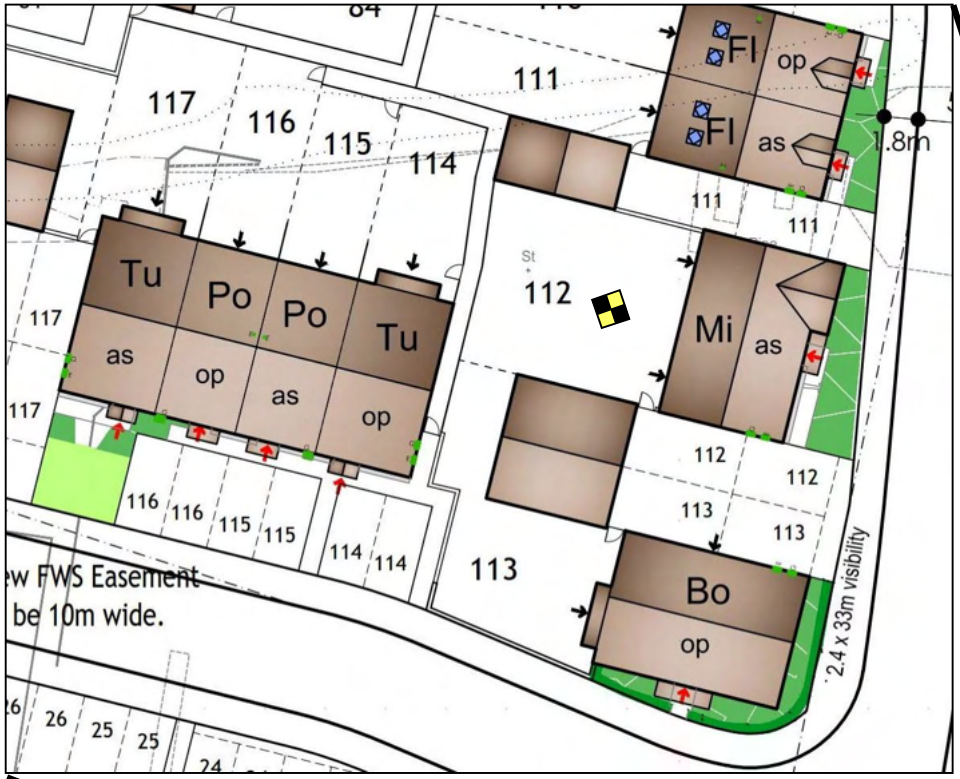
APPENDIX B





DO NOT SCALE

NOTES:

Approx. location of capping validation pit.

GRM Development Solutions Ltd
Laurus House, First Ave, Centrum 100,
Burton-on-Trent, Staffordshire
Tel: 01283 551 249
info@grm-uk.com www.grm-uk.com

CLIENT:

Bellway Homes West Midlands

PROJECT:

Oakamoor Road, Cheadle

TITLE:

Validation Pit Location Plan
Plot 112

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN :	DATE:
SS	Nov 2022
PROJECT No:	DRAWING No:
P9119	01

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DO NOT SCALE

NOTES:

Validation undertaken on 3rd November 2022

GRM Development Solutions Ltd
Laurus House, First Ave, Centrum 100,
Burton-on-Trent, Staffordshire
Tel: 01283 551 249
info@grm-uk.com www.grm-uk.com

CLIENT:

Bellway Homes West Midlands

PROJECT:

Oakamoor Road, Cheadle

TITLE:

Capping Validation Photos Plot 112

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN :	DATE:
SS	Nov 2022
PROJECT No:	DRAWING No:
P9119	02

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APPENDIX C

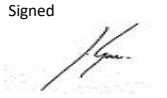
Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

GRM Development Solutions
Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L22/02933/GRM - 22-26971

Your Project Reference:	**P9119 Cecilly Mills Cheadle**		
Your Order Number:	P9119	Samples Received / Instructed:	07/06/2022 / 07/06/2022
Report Issue Number:	1	Sample Tested:	07/06 to 24/06/2022
Samples Analysed:	6 soil samples	Report issued:	24/06/2022

Signed



James Gane
Analytical Services Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where futher analaysis is required samples identified as containing asbestos are screened and tested on an as recevied basis. No correction is made for moisture content and these results are not covered by our accrediation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
L:\DATA\REPORTS\GRM495\[L22-02933-GRM - 22-26971.XLSM]TPH Codes

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

Analytical Test Results - Soil

NC Reference			239970	239971	239972	239973	239974	239975
Client Sample ID			Sub 1	Sub 2	Sub 3	ts 1	ts 2	ts 3
Client Sample Location			Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			-	-	-	-	-	-
Depth - Bottom (m)			-	-	-	-	-	-
Date of Sampling			06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Loam	Loam	Loam
Determinant	**Units**	**Accreditation**						
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10
Cadmium	(mg/kg)	MCERTS	1.6	1.3	1.1	1.8	1.8	1.8
Chromium (Total)	(mg/kg)	UKAS	12	10	9.2	13	13	13
Copper	(mg/kg)	MCERTS	27	22	16	36	34	35
Lead	(mg/kg)	MCERTS	39	28	15	91	90	88
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	15	14	15	14	14	14
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	75	64	48	130	130	130
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	u	< 1	< 1	< 1	< 1	< 1	< 1
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	8.8	8.7	8.8	7.3	6.9	6.9
Sulphate (Water soluble)	(mg/l)	u	680	430	160	110	74	76
Acenaphthene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.20	< 0.20	< 0.20	0.03	0.04	0.03
Benzo (a) anthracene	(mg/kg)	MCERTS	0.29	0.36	0.34	0.15	0.15	0.16
Benzo (a) pyrene	(mg/kg)	MCERTS	0.28	0.36	0.33	0.21	0.19	0.20
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.26	0.33	0.31	0.22	0.20	0.21
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.24	0.28	0.27	0.12	0.10	0.11
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	0.08	0.08	0.08
Chrysene	(mg/kg)	MCERTS	0.27	0.35	0.33	0.17	0.17	0.18
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.44	0.60	0.55	0.34	0.37	0.33
Fluorene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.20	0.25	0.22	0.13	0.11	0.12
Naphthalene	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.27	0.34	0.32	0.12	0.13	0.11
Pyrene	(mg/kg)	MCERTS	0.41	0.55	0.51	0.30	0.32	0.29
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	4.2	5.0	4.7	2.0	2.0	1.9
SOM (via TOC)	(%)	UKAS	1.8	< 1.7	< 1.7	6.2	5.3	6.1
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

Analytical Test Results - TPH CWG

NC Reference			239970	239971	239972	239973	239974	239975
Client Sample ID			Sub 1	Sub 2	Sub 3	ts 1	ts 2	ts 3
Client Sample Location			Stockpile	Stockpile	Stockpile	Stockpile	Stockpile	Stockpile
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			-	-	-	-	-	-
Depth - Bottom (m)			-	-	-	-	-	-
Date of Sampling			06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Loam	Loam	Loam
Determinant	**Units**	**Accreditation**						
Aliphatics								
>C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	u	0.11	< 0.04	0.16	0.09	0.16	0.21
>C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	0.09	0.15	0.15	0.21	0.17
>C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	0.09	< 0.05	< 0.04	< 0.04	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10	15	< 10	< 10	< 10	< 10
>C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10	25	13	< 10	< 10	< 10
>C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	19	110	62	29	22	20
Aromatics								
>C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.05	< 0.04	< 0.04	< 0.05
>C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.05	0.06	< 0.04	< 0.05
>C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.05	< 0.04	< 0.04	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10	12	< 10	< 10	< 10	< 10
>C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	18	21	12	< 10	< 10	< 10
>C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	63	170	76	45	31	31
Total								
>C_5 to C_{40} [EH_CU+HS_1D_Total]	(mg/kg)	u	120	530	250	110	66	52

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
239970	Sub 1	Stockpile	-	-	Dark red slightly gravelly clayey loamy sand with occasional organic matter	10	27	41
239971	Sub 2	Stockpile	-	-	Dark red slightly gravelly clayey loamy sand with occasional organic matter	9.9	28	54
239972	Sub 3	Stockpile	-	-	Dark red slightly gravelly clayey silty loam with occasional organic matter	7.8	22	68
239973	ts 1	Stockpile	-	-	Dark brown slightly gravelly clayey silty loam with occasional organic matter	23	0.8	64
239974	ts 2	Stockpile	-	-	Dark brown slightly gravelly clayey silty loam with occasional organic matter	23	8.4	68
239975	ts 3	Stockpile	-	-	Dark brown slightly gravelly clayey silty loam with occasional organic matter	24	5.1	58

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L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
239970	Sub 1	Stockpile	-	-	
239971	Sub 2	Stockpile	-	-	
239972	Sub 3	Stockpile	-	-	
239973	ts 1	Stockpile	-	-	VPH - Sample taken from container with headspace.
239974	ts 2	Stockpile	-	-	
239975	ts 3	Stockpile	-	-	

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L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
SUBCON-CN	Subcontract - Cyanide	-	-	Cyanide Testing was subcontracted to a MCERTS accredited laboratory
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis

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7 - 11 Harding Street
Leicester
LE1 4DH

L22/02933/GRM - 22-26971

Project Reference - P9119 Cecilly Mills Cheadle

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

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7 - 11 Harding Street
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GRM Development Solutions
Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L22/04072/GRM - 22-28522

Your Project Reference:	**P9119 Cecilly Mills Cheadle**		
Your Order Number:	P9119 swsub	Samples Received / Instructed:	03/08/2022 / 03/08/2022
Report Issue Number:	1	Sample Tested:	03/08 to 12/08/2022
Samples Analysed:	1 soil sample	Report issued:	12/08/2022

Signed



James Gane
Analytical Services Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where futher analaysis is required samples identified as containing asbestos are screened and tested on an as recevied basis. No correction is made for moisture content and these results are not covered by our accrediation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
L:\DATA\REPORTS\GRM495\[L22-04072-GRM - 22-28522.XLSM]TPH Codes

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/04072/GRM - 22-28522

Project Reference - P9119 Cecilly Mills Cheadle

Analytical Test Results - Soil

NC Reference			254278
Client Sample ID			-
Client Sample Location			SS4
Client Sample Type			D/ES
Client Sample Number			-
Depth - Top (m)			-
Depth - Bottom (m)			-
Date of Sampling			02/08/2022
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Arsenic	(mg/kg)	MCERTS	< 10
Cadmium	(mg/kg)	MCERTS	0.6
Chromium (Total)	(mg/kg)	UKAS	18
Copper	(mg/kg)	MCERTS	18
Lead	(mg/kg)	MCERTS	21
Mercury	(mg/kg)	UKAS	< 2.5
Nickel	(mg/kg)	MCERTS	18
Selenium	(mg/kg)	u	< 8.0
Zinc	(mg/kg)	MCERTS	64
Total Phenols	(mg/kg)	MCERTS	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0
pH	pH Units	MCERTS	8.0
Sulphate (Water soluble)	(mg/l)	u	120
Acenaphthene	(mg/kg)	MCERTS	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	0.05
Benzo (a) pyrene	(mg/kg)	MCERTS	0.06
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.07
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.03
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.02
Chrysene	(mg/kg)	MCERTS	0.06
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.12
Fluorene	(mg/kg)	MCERTS	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.03
Naphthalene	(mg/kg)	MCERTS	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.06
Pyrene	(mg/kg)	MCERTS	0.11
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.74
SOM (via TOC)	(%)	UKAS	< 1.7
Asbestos	-	UKAS	No asbestos detected

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L22/04072/GRM - 22-28522

Project Reference - P9119 Cecilly Mills Cheadle

Analytical Test Results - TPH CWG

NC Reference			254278
Client Sample ID			-
Client Sample Location			SS4
Client Sample Type			D/ES
Client Sample Number			-
Depth - Top (m)			-
Depth - Bottom (m)			-
Date of Sampling			02/08/2022
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Aliphatics			
>C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	u	< 0.05
>C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	u	0.26
>C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	u	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10
>C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10
>C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10
>C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	42
Aromatics			
>C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	u	< 0.05
>C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	u	< 0.05
>C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	u	< 0.05
>C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10
>C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10
>C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	13
>C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	66
Total			
>C_5 to C_{40} [EH_CU+HS_1D_Total]	(mg/kg)	u	190

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Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
254278	-	SS4	D/ES	-	Dark reddish brown slightly clayey slightly gravelly silty sand with rare rootlets	10	7.9	68

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Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
254278	-	SS4	D/ES	-	

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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis

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HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

APPENDIX D

	GRM TIER 1 ASSESSMENT CRITERIA		
LAND USE	Residential with Plant Uptake		
CONTAMINANT	**1%**	**2.50%**	**6%**
[a] Arsenic	37	37	37
[a] Cadmium	22	22	22
[b] Chromium III	910	910	910
[a] Chromium VI	21	21	21
[a] Lead	200	200	200
[b/c] Mercury	40	40	40
[b] Selenium	250	250	250
[b] Nickel	180	180	180
[b] Phenols	280	550	1100
[b] Copper	2400	2400	2400
[b] Zinc	3700	3700	3700
[d] Cyanide	34	34	34
[a] Benzene	0.20	0.33	0.87
[b] Toluene	130	290	660
[b] Ethylbenzene	47	110	260
[b] *o* - xylene	60	140	330
[b] *m* - xylene	59	140	320
[b] *p* - xylene	56	130	310
Non Genotoxic PAHs			
[b] Acenaphthene	210	510	1100
[b] Acenaphthylene	170	420	920
[b] Anthracene	2400	5400	11000
[b] Fluoranthene	280	560	890
[b] Fluorene	170	400	860
[b] Naphthalene	2.3	5.6	13
[b] Phenanthrene	95	220	440
[b] Pyrene	620	1200	2000
Genotoxic PAHs			
[a/e] Benzo(a)pyrene	5	5	5
ALIPHATIC HYDROCARBONS			
[b] C5-C6	42	78	160
[b] C6-C8	100	230	530
[b] C8-C10	27	65	150
[b] C10-C12	130	330	760
[b] C12-C16	1100	2400	4300
[b] C16-35	65000	92000	110000
AROMATIC HYDROCARBONS			
[b] C5-7 (benzene)	70	140	300
[b] C7-8 (toluene)	130	290	660
[b] C8-C10	34	83	190
[b] C10-C12	74	180	380
[b] C12-C16	140	330	660
[b] C16-C21	260	540	930
[b] C21-C35	1100	1500	1700

Notes

a C4SL - SP1010 (2014) - Benzene and Benzo(a)pyrene values for 1% and 2.5% SOM have been calculated using default C4SL parameters in CLEA v1.07

b LQM/CIEH S4UL values (2015).

c S4UL for inorganic Hg used.

d Atkins ATRISKsoil Value

e Benzo(a)pyrene is a surrogate marker for the 8 genotoxic PAHs (Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(ah)anthracene, Ideno(1,2,3-cd)pyrene)

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