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9th October 2020

Jelson Homes Limited,
370 Loughborough Road
Leicester,
LE4 5PR

For the attention of Elliott Green

Dear Elliott,

Residential Development at Littleworth Drove, Deeping St Nicholas – Remediation and Validation of Elevated PAHs.

Background

Following the initial intrusive ground investigation works undertaken at the site in July 2019 and submission by Jelson Homes Limited of ground investigation report no. G19102-IR (dated August 2019) to South Holland District Council a response confirmed general agreement with the report's findings but declined to remove a planning condition relating to localised elevated levels of PAH's. In order to provide additional information relating to the south western corner of the site additional trial pitting and subsequent laboratory testing was undertaken. Our further findings and recommendations were provided in a letter dated 15th November 2019. The area of the site was covered in topsoil mixed with ash and locally contained elevated levels of PAH'S. This was confirmed to cover a localised area of approximately 20m x 20m. Notification was received from South Holland District Council Environmental Protection Officer that planning condition 11 of H03-0331-16 could not be discharged until a remediation method statement had been provided. Nicholls Colton Group provided the remediation method statement for the site as outlined below.

Remediation Method Statement for Treatment of Elevated PAH's 'Hotspot'

The area of the site containing topsoil contaminated with elevated PAH's (identified within trial pits TP5, TP17B, TP18 and TP24) was to be set out and clearly identified. A copy of the exploratory hole location plan identifying the trial pit locations is attached.

In order to protect the site from groundwater flooding it is understood that the developer proposes to increase the ground level across the entire site area by approximately 1.00m utilising either inert imported soils or, in terms of proposed access roads, approved carriageway construction materials.

Given that the soils within the delineated 'hotspot' containing elevated levels of PAH (ranging in depth from 0.30m to 0.60m) are predominantly topsoil based and contain organic matter it is recommended that they should be stripped (and not buried) to reveal the underlying natural granular and cohesive soils prior to covering with imported inert cohesive soils.

Of note, with the exception of a single sample recovered at a depth of 0.20m within trial pit TP17B, all of the remaining test results which exceed the '*residential with plant uptake*' trigger levels comply with the '*public open space residenti*al' trigger levels.

It was agreed by South Holland District Council that on the basis of the above the excavated material may be utilised as fill to raise the ground level within an area of public open space

Validation of hotspot removal

On 21st September a Nicholls Colton Group Geo-Environmental Engineer attended the site to oversee the remedial works being undertaken at the site and to obtain confirmatory samples to validate the removal of the hotspot.

The area of the hotspot was set out in accordance with the recommendations of our letter dated 2nd January 2020 based upon the locations of the trial pits undertaken and subsequent laboratory testing. The surface materials were excavated across the entire area of the hotspot to a depth where the underlying natural strata were exposed (typically 0.40-0.60m below existing ground level). A former farm drainage channel was noted during the remedial works and the full depth of this was also excavated.

The material removed was placed in an area of public open space adjacent to the western site boundary to a level that will allow a suitable depth of imported material to be placed as capping. It should be remembered that this material is only marginally exceeded the S4UL for PAH in a single location.

Photographic records of the excavation have been taken and selected photos are attached.

Samples were obtained from the base of the excavation and submitted to the laboratory for analysis. The results of the laboratory testing are attached. The results confirm that all of the samples of the material remaining below the area of the hotspot are below the relevant S4UL values.

On the basis of the works carried out at the site and the laboratory test results above it is considered that no further remedial works are required with regards to the protection of future occupiers at the site.

We trust the contents of this letter are satisfactory and if so should be forwarded to the South Holland District Council Environmental Protection Officer to allow discharge of the outstanding condition. Please do not hesitate to contact the writer should you wish to discuss the findings or require any further information.

Yours faithfully,



P.I. Plumpton
Senior Geo-Environmental Engineer
NICHOLLS COLTON GROUP

Enc.
Exploratory Hole Location Plan
Laboratory Test Results
Photographic Records

VALIDATION PHOTOGRAPHS

Excavation looking west:



Excavation looking north west:



VALIDATION PHOTOGRAPHS

Excavation looking East: Note deeper excavation of former drainage channel.



Excavation looking north east:



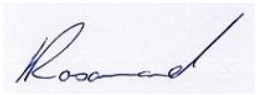
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Analytical Test Report: G19102-D/001

Your Project Reference:	**Land Off Littleworth Drove, Deeping St Nicholas**	Samples Received on:	22/09/2020
Your Order Number:	G19102-D	Testing Instruction Received:	22/09/2020
Report Issue Number:	1	Sample Tested:	22/09 to 06/10/2020
Samples Analysed:	4 soil samples	Report issued:	08/10/2020

Signed



Hollis Rosamond
Asbestos & Sample Registration Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab 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.

Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

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

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**No**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

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

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19102-D\[G19102-D-001.XLSX]Cover Sheet

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G19102-D/001
Project Reference - Land Off Littleworth Drove, Deeping St Nicholas
Analytical Test Results - Soil

NC Reference			112088	112089	112090	112091
Client Sample ID			-	-	-	-
Client Sample Location			VAL	VAL	VAL	VAL
Client Sample Type			E	E	E	E
Client Sample Number			1	2	3	4
Depth - Top (m)			0.20	0.30	0.20	0.50
Depth - Bottom (m)			0.20	0.30	0.20	0.50
Date of Sampling			21/09/2020	21/09/2020	21/09/2020	21/09/2020
Time of Sampling			AM	AM	AM	AM
Sample Matrix			Sand	Sand	Sand	Clay
Determinant	**Units**	**Accreditation**				
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.03
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.06
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.04
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.05
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.06
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.03
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	0.05
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	< 0.32	< 0.32	< 0.32	0.54

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G19102-D/001

Project Reference - Land Off Littleworth Drove, Deeping St Nicholas

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)
112088	-	VAL	E	1	Brown slightly clayey silty sand with rare organic matter	18	0.1
112089	-	VAL	E	2	Greyish brown slightly clayey silty sand with rare organic matter	25	0.0
112090	-	VAL	E	3	Greyish brown slightly clayey silty sand with rare organic matter	23	0.0
112091	-	VAL	E	4	Dark brown slightly silty sandy clay with rare rootlets	31	0.0

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G19102-D/001

Project Reference - Land Off Littleworth Drove, Deeping St Nicholas

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)



Key:

- Window Sample borehole with gas monitoring installation
- Cable Percussion borehole
- Trial Pit Location
- EHO planning condition trial pit Location
- Sulphate Investigation trial pit location
- Sample Location for imported fill Sulphate test Validation Sample Location

NICHOLLS COLTON GROUP

Client:
Jelson Homes Limited

Project:
Land off Littleworth Drove, Deeping St Nicholas, Lincolnshire.

Title:
Plan showing extent of remediation.

Date:	Drawing No.
October 2020	G19102-IR/03