Torsion Projects
Tomlinson House
Capitol Boulevard
Morley
Leeds
LS27 0TS

31st July 2025

Project Ref: AP3906

FAO Tim Jones

Dear Sir,

Development at Thomas Street, Lindley, Huddersfield
Environmental Capping

On the 30th July 2025, 3 inspection pits were undertaken from the areas of soft landscaping within the site to determine if the depth of the imported clean fill meets the minimum 600mm requirements set out in the verification report.

Attached to this letter is a location plan of the inspection pits, photographic evidence of the inspection pits and chemical results for the imported clean fill.

Results

The pits were visually inspected for any deleterious materials and their overall depth from surface level. No visible deleterious material was recorded within the inspection pits on site and olfactory signs of contamination were not recorded.

Tim O'Hare Associates produced a Topsoil Analysis Report for the imported clean fill which is attached at the end of this report in Appendix B. The imported clean fill was sourced from Barnsdale Bar Quarry and chemically tested in accordance with British Standard for Topsoil (BS3882:2015 Specification for Topsoil) along with the following contaminants;

- Heavy Metals;
- Total Cyanide and total (mono) phenols;
- Aromatic and Aliphatic TPH (C5-C35) banding);
- Speciated PAHs (USEPA 16 suite);
- BTEX; and
- Asbestos Screen

It was concluded that the topsoil would be suitable for general landscape purposes. A comparison of the chemical results against the soil guideline values for a residential development with plant uptake is provided in Appendix C.

From inspection of the pits the imported clean fill was recorded in each position to be a minimum of 700mm in depth with the centre courtyard recording a depth of 800mm. This meets the requirement of a minimum of 600mm and is therefore considered suitable. Photographic evidence is included in Appendix D.

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Conclusions

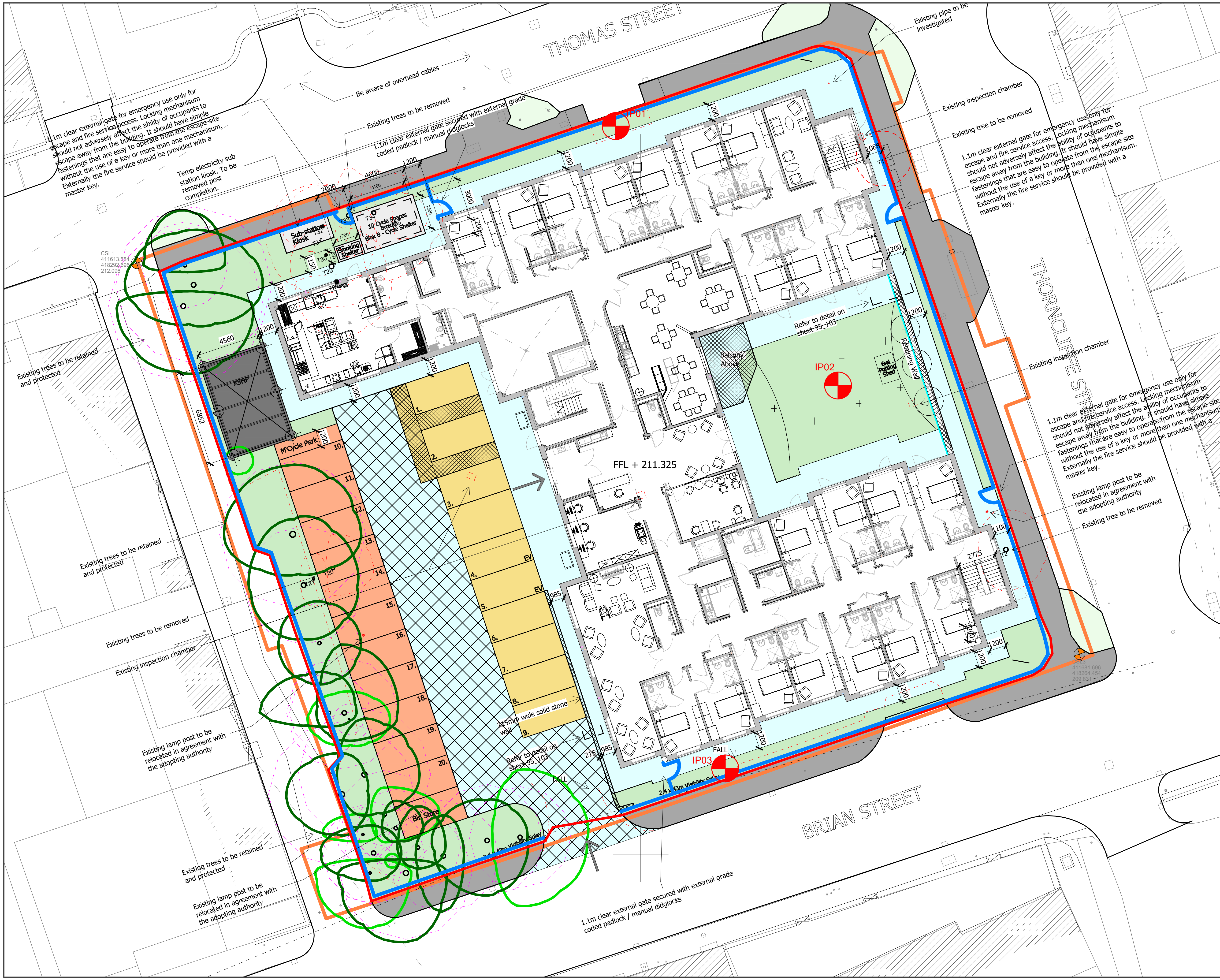
The chemical results and inspection of the pits meets the verification requirements set out in the Ardmore Point Ltd report 'Phase 3 Remediation Strategy Report Thomas Street Lindley Huddersfield'. As such, we are satisfied that the requirements for remedial measures has been met.

We trust the above meets with your requirements at this time, any queries or you require any further information please do not hesitate to contact ourselves.

Kind Regards,

Ross Gill
Geotechnical Engineer
Ardmore Point Ltd

Appendix A:
Inspection Pit Location Plan



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DRAWN:	CHECKED:	DATE:	REVISION:
RG	SM	01/08/25	A

PROJECT NAME: Thomas Street
Lindley, Huddersfield

DRAWING TITLE: Inspection Pit Location Plan

SCALE:	SHEET SIZE:	SHEET NO:
1:50, 1:100	A3	1 of 1

PROJECT NO:	STATUS:
AP3906	Verification

DRAWING NO: AP3906/RM/01

Appendix B:
Chemical Report

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Mark Wood
Green-tech Ltd
Rabbit Hill Park
Great North Road
Arkendale
Knaresborough
North Yorkshire HG5 0FF

7th March 2025
Our Ref: TOHA/25/1740/2/SS
Your Ref: PO 440041

Dear Sirs

Topsoil Analysis Report: Barnsdale Landscape Grade Topsoil

We have completed the analysis of the soil sample recently collected from site, referenced *Barnsdale Landscape Grade Topsoil* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil).*

This report presents the results of analysis for the sample collected on 20/02/2025, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing, especially after the topsoil has left the Green-tech Ltd site.

SAMPLING

The topsoil was examined and sampled at the Green-tech Ltd source at Barnsdale Bar Quarry on 20/02/2025 by Ross Friar of Tim O'Hare Associates LLP. A representative composite topsoil sample was collected in accordance with Section 5 (*Sampling of topsoil*) of the British Standard for Topsoil (*BS3882:2015 Specification for Topsoil*).

Plate 1: Stockpiled Barnsdale Landscape Grade Topsoil

Plate 2: Barnsdale Landscape Grade Topsoil

Visual Examination

The topsoil was stored in a small, loosely heaped stockpile on site.

The topsoil was described as a dark reddish brown (Munsell Colour 5 YR 3/3) slightly moist, friable, slghtly calcareous LOAMY SAND with a weakly developed, fine to medium granular structure. The soil was virtually stone-free and contained moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- total cyanide and total (mono) phenols;
- aromatic and aliphatic TPH (C5-C35 banding);
- speciated PAHs (US EPA16 suite);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

***Detailed Particle Size Analysis and Stone* Content**

The sample fell into the *loamy sand* texture class. Further detailed particle size analysis found the sample to have a sufficiently narrow particle size distribution and a predominance of *fine sand* (0.05-0.15mm) and *medium sand* (0.25-0.50mm). This is usually ideal for topsoil in general landscape applications as reasonable porosity levels can be maintained in a consolidated state and the risk of particle interpacking is reduced. This type of grading therefore normally provides adequate water attenuation, drainage and aeration properties for general landscape applications.

The sample was virtually stone-free and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.4). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by $CaSO_4$ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1.*

Organic Matter and Fertility Status

The sample was adequate to well supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels* (C4SLs) *for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1.*

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil sample for general landscape purposes. The analysis has also been undertaken to determine the sample's compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil).*

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, slightly calcareous *loamy sand* with an adequate structure and very low stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil).*

General Landscape Environments

Rootballed Trees

The most demanding planting environment is semi-mature, pit planted trees. Trees of this size and age have grown accustomed to optimum growing conditions in the nursery, and these need to be replicated when the rootballed or containerised tree is planted in the pit. In particular, aeration and drainage around the rootball are critical. Without these properties, trees will very quickly suffer and possibly die during their first few growing seasons after planting.

Shrubs

Containerised shrubs are generally more tolerant of a wider range of soil-types, and they require less topsoil to root into than trees. The topsoil would be suited to a range of shrubs typically used in commercial and domestic landscaping.

Forestry Stock

Less demanding planting habitats include indigenous woodland planting, planted as small whips and feathered trees. The topsoil would be suitable for such planting environments.

Amenity Grass

This soil would be considered suitable for amenity grass seeding and turfing

Sports Pitches

This soil is suited for sports pitch construction given its high sand content. However, all materials to be used for sports pitch construction, including topsoil, should be carefully considered in relation to the required performance and standard of the sports pitch.

Domestic Gardens

The horticultural properties of the soil would be suitable for domestic garden applications. In addition, of the potential contaminants determined, none was found at levels that would be considered elevated. However, permissible levels for potential contaminants do vary from site to site. Therefore, the suitability of topsoil represented by this sample for any particular project or development should be confirmed by comparing the results against the site's specific assessment criteria.

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, respreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015.*

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully

Ross Friar
MEnvSci
Soil Scientist

Aaron Cross
BSc MSc MISoilSci
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Green-tech Ltd**
Project	**Barnsdale Landscape Grade Topsoil**
Job:	**Topsoil Analysis - BS3882:2015**
Date:	**07/03/2025**
Job Ref No:	**TOHA/25/1740/2/SS**

Sample Reference			**Landscape Grade Topsoil**
		Accreditation	
Clay (<0.002mm)	%	UKAS	5
Silt (0.002-0.05mm)	%	UKAS	18
Very Fine Sand (0.05-0.15mm)	%	UKAS	16
Fine Sand (0.15-0.25mm)	%	UKAS	30
Medium Sand (0.25-0.50mm)	%	UKAS	26
Coarse Sand (0.50-1.0mm)	%	UKAS	3
Very Coarse Sand (1.0-2.0mm)	%	UKAS	2
Total Sand (0.05-2.0mm)	%	UKAS	77
Texture Class (UK Classification)	--	UKAS	LS
Stones (2-20mm)	% DW	GLP	1
Stones (20-50mm)	% DW	GLP	0
Stones (>50mm)	% DW	GLP	0
pH Value (1:2.5 water extract)	units	UKAS	8.4
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	947
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	2864
Exchangeable Sodium Percentage	%	UKAS	3.2
Organic Matter (LOI)	%	UKAS	3.4
Total Nitrogen (Dumas)	%	UKAS	0.19
C : N Ratio	ratio	UKAS	11
Extractable Phosphorus	mg/l	UKAS	56
Extractable Potassium	mg/l	UKAS	1145
Extractable Magnesium	mg/l	UKAS	216
Total Arsenic (As)	mg/kg	MCERTS	3
Total Cadmium (Cd)	mg/kg	MCERTS	0.3
Total Chromium (Cr)	mg/kg	MCERTS	6
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
Total Copper (Cu)	mg/kg	MCERTS	14
Total Lead (Pb)	mg/kg	MCERTS	12
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	5
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	52
Water Soluble Boron (B)	mg/kg	MCERTS	1.6
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0
Naphthalene	mg/kg	MCERTS	< 0.05
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	< 0.05
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	< 0.05
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	< 0.05
Pyrene	mg/kg	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	MCERTS	< 0.05
Chrysene	mg/kg	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	< 0.05
Total PAHs (sum USEPA16)	mg/kg	MCERTS	< 0.80
Aliphatic TPH >C5 - C6	mg/kg	MCERTS	< 0.010
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	< 0.010
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	< 0.010
Aliphatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aliphatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aliphatic TPH >C16 - C21	mg/kg	MCERTS	< 8.0
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	< 8.0
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Aromatic TPH >C5 - C7	mg/kg	MCERTS	< 0.010
Aromatic TPH >C7 - C8	mg/kg	MCERTS	< 0.010
Aromatic TPH >C8 - C10	mg/kg	MCERTS	< 0.020
Aromatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aromatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aromatic TPH >C16 - C21	mg/kg	MCERTS	< 10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	< 10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Benzene	mg/kg	MCERTS	< 0.005
Toluene	mg/kg	MCERTS	< 0.005
Ethylbenzene	mg/kg	MCERTS	< 0.005
p & m-xylene	mg/kg	MCERTS	< 0.008
o-xylene	mg/kg	MCERTS	< 0.005
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.005
Asbestos	ND/D	ISO 17025	Not-detected

LS = LOAMY SAND

Visual Examination

The topsoil was described as a dark reddish brown (Munsell Colour 5 YR 3/3) slightly moist, friable, slghtly calcareous LOAMY SAND with a weakly developed, fine to medium granular structure. The soil was virtually stone-free and contained moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

R Friar

Ross Friar
MEnvSci
Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with

Appendix C:
Human Health Risk Assessment

Contaminant	Units	Effect	Concentration Range (mg/kg)	Measured concentrations in excess of S4UL/GSV/SGV (mg/kg)	Guidance Level (mg/kg)	Measured Exceedance Concentration
Arsenic	mg/kg	Toxic	3.00	0	37	-
Cadmium	mg/kg	Toxic	0.30	0	11	-
Chromium III	mg/kg	Toxic	6.00	0	910	-
Chromium VI	mg/kg	Toxic	<1.80	0	6	-
Copper	mg/kg	Toxic	14.00	0	2400	-
Lead	mg/kg	Toxic	12.00	0	200	-
Mercury	mg/kg	Toxic	<0.30	0	40	-
Nickel	mg/kg	Toxic	5.00	0	130	-
Selenium	mg/kg	Toxic	<1.00	0	250	-
Zinc	mg/kg	Toxic	52.00	0	3700	-
Petroleum Hydrocarbons						
Aliphatic C5-C6	mg/kg	Toxic	<0.01	0	42	-
Aliphatic C6-C8	mg/kg	Toxic	<0.01	0	100	-
Aliphatic C8-C10	mg/kg	Toxic	<0.01	0	27	-
Aliphatic C10-C12	mg/kg	Toxic	<1.00	0	130	-
Aliphatic C12-C16	mg/kg	Toxic	<2.00	0	1100	-
Aliphatic C16-C21	mg/kg	Toxic	<8.00	0	65000	-
Aliphatic C21-C35	mg/kg	Toxic	<8.00	0	65000	-
Aromatic C5-C7	mg/kg	Toxic	<0.01	0	70	-
Aromatic C7-C8	mg/kg	Toxic	<0.01	0	130	-
Aromatic C8-C10	mg/kg	Toxic	<0.02	0	34	-
Aromatic C10-C12	mg/kg	Toxic	<1.00	0	74	-
Aromatic C12-C16	mg/kg	Toxic	<2.00	0	140	-
Aromatic C16-C21	mg/kg	Toxic	<10.00	0	260	-
Aromatic C21-C35	mg/kg	Toxic	<10.00	0	1100	-
PAHs						
Naphthalene	mg/kg	Toxic	<0.05	0	2.3	-
Acenaphthylene	mg/kg	Toxic	<0.05	0	170	-
Acenaphthene	mg/kg	Toxic	<0.05	0	210	-
Fluorene	mg/kg	Toxic	<0.05	0	170	-
Phenanthrene	mg/kg	Toxic	<0.05	0	95	-
Anthracene	mg/kg	Toxic	<0.05	0	2400	-
Fluoranthene	mg/kg	Toxic	<0.05	0	280	-
Pyrene	mg/kg	Toxic	<0.05	0	620	-
Benzo(a)anthracene	mg/kg	Toxic	<0.05	0	7.2	-
Chrysene	mg/kg	Toxic	<0.05	0	15	-
Benzo(b)fluoranthene	mg/kg	Toxic	<0.05	0	2.6	-
Benzo(k)fluoranthene	mg/kg	Toxic	<0.05	0	77	-
Benzo(a)pyrene	mg/kg	Toxic	<0.05	0	2.2	-
Indeno(1,2,3-c,d)pyrene	mg/kg	Toxic	<0.05	0	27	-
Dibenzo(a,h)anthracene	mg/kg	Toxic	<0.05	0	0.24	-
Benzo(g,h,i)perylene	mg/kg	Toxic	<0.05	0	320	-
BTEX						
Benzene	mg/kg	Toxic	<0.005	0	0.087	-
Toluene	mg/kg	Toxic	<0.005	0	130	-
Ethylbenzene	mg/kg	Toxic	<.0.005	0	47	-
p & m-xylene	mg/kg	Toxic	<0.008	0	56	-
o-xylene	mg/kg	Toxic	<0.005	0	60	-
MTBE	mg/kg	Toxic	<0.005	0	40	-
Others						
Asbestos	mg/kg	Toxic	None Detected	0	Detection	-
Total Cyanide	mg/kg	Toxic	<1.00	0	34	-
Total (mono) Phenols	mg/kg	Toxic	<1.00	0	120	-

*1% SOM has been utilised to be conservative

Appendix D:
Photographic Evidence of Inspection Pits

Inspection Pit No. 1

Depth: 700mm	Lindley, Huddersfield	30/07/2025

Inspection Pit No. 1

Depth: 700mm	Lindley, Huddersfield	30/07/2025

Inspection Pit No. 2

Depth: 700mm | Lindley, Huddersfield | 30/07/2025

Inspection Pit No. 1		
		
Depth: 700mm	Lindley, Huddersfield	30/07/2025

Inspection Pit No. 3

Depth: 700mm	Lindley, Huddersfield	30/07/2025

Inspection Pit No. 3

Depth: 700mm	Lindley, Huddersfield	30/07/2025