Phase 2
Ground Investigation

Client: Lidl Great Britain Ltd

Lidl Ruislip Victoria Road Car Park

Report No: 952.03.01

November 2024

REMADA GEO CONSULTANTS

Executive Summary

Remada Ltd was commissioned by Lidl Great Britain Ltd to conduct a Phase 2 Ground Investigation at the site of the former Benson for Bed store in South Ruislip, London. This report follows a Phase 1 Preliminary Risk Assessment (Remada report reference 952.01 dated February 2022) and a request from the Local Authority Environment Health Officer (EHO).

Summary of Phase 1 Desk Study

The site was an engineering and metallising works and, latterly, a Benson for Beds store, which, at the time of the investigation, had been recently demolished

Geological mapping indicates that the site is directly underlain by the London Clay Form, an Unproductive Strata.

Intrusive Investigation

A variable thickness of made ground was encountered beneath the site which varied from between 0.6 and 0.9m in thickness. The made ground was generally granular and contained fragments of concrete, brick, metal, plastic, wood, slate and flint.

Bedrock geology was found to comprise silty clay or sandy silt. The bedrock has been interpreted as the London Clay Formation, which is classified as an unproductive strata.

Human Health Assessment

The results of soil chemical analysis were compared to Human Health Generic Assessment Criteria for commercial land use. While elevated levels of asbestos were encountered, they do not pose a risk to human health as the entire site shall be covered in hardstanding, breaking the source pathway receptor model.

Water Resources Assessment

The results of the soil chemical analysis undertaken have identified that concentrations of metals and inorganic contaminants are within the range typical for made ground. Detectable concentrations of TPH and PAHs were encountered in all samples. However, the contaminants identified are of low solubility and mobility and, as such, are unlikely to present a risk to groundwater beneath the site. In addition, it should be noted that the site will be covered with hardstanding. Therefore, the risk of leaching of contaminants as a result of infiltration of groundwater is likely to be limited. In addition, the underlying soils are cohesive, which will further limit the migration of contaminants, and the bedrock is recorded as an Unproductive Strata. Therefore, the risk to groundwater from contaminants within the made ground at the site is considered to be low and does not warrant further consideration.

Waste Classification

The chemical analysis results indicate that the material would be classified as hazardous waste due to the presence of elevated asbestos fibres.

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Appendix A Laboratory Chemical Analyses

Issue No	Date	Prepared By	Technical Review	Authorised
01	28.10.2024	P Searing	G Jones	G Jones

1 INTRODUCTION

Remada Ltd was commissioned by Lidl Great Britain Ltd (hereafter 'the Client') to undertake a Phase 2 Ground Investigation of the former Benson for Beds store within their existing car park at Victoria Road, Ruislip, London, HA4 0QQ at the location indicated in **Figure 1.**

1.1 Objectives

The objectives of this assessment are as follows:

- to examine whether there have been any potentially contaminative uses on the site or nearby land;
- to develop a conceptual model of the site to identify plausible pollutant linkages; and
- to assess ground conditions in relation to the proposed development with regard to the presence, nature, likely severity, and extent of soil and groundwater contamination, which may be present, its potential environmental impact, and likely requirement for further work.

1.2 Scope of Work

The scope and layout of this investigation and report are generally in accordance with BS10175:2011+A2 2017 and the Environment Agency's Land Contamination Risk Management guidance for land contamination reports.

The scope of work comprised:

- 4 No trial pits
- 4 No soil sample suites for chemical analysis of CLEA metals, asbestos, speciated hydrocarbons, cyanide, and phenols to delineate any potential soil contamination;
- Combined Factual & Interpretative Geoenvironmental Report.

The investigation methodology is presented in Section 4, Findings in Section 5, and the Exploratory Locations are indicated in **Figure 2**

1.3 Proposed Development

The former Benson's for Beds site is located within an existing car park adjacent to an existing Lidl store. The proposed car park will be constructed over the now demolished Benson for the Beds store, to create a larger car par as shown in **Figure 2**.

1.4 Previous Reports

The following Phase 1 Desk Study had been previously prepared for the site:

- Phase 1 Site Investigation & Preliminary Risk Assessment. Remada Ltd Report 952.01 February 2022.

The following reports have previously been prepared for the redevelopment of the broader site for the existing layout.

- Phase 1 Preliminary Geoenvironmental Risk Assessment, Proposed Lidl Store, Victoria Road, Ruislip, Remada 276.01 November 2013.
- Phase 2 Geoenvironmental Ground Investigation, Proposed Lidl Store, Victoria Road, Ruislip, Remada 276.02r1 August 2014.
- Lidl Ruislip, Investigation at Former Comet Store, Letter Report 276.03 14th March 2016.

None of the exploratory positions were in the location of the existing *Bensons for Beds* store.

1.5 Limitations

The comments given in this report and the opinions expressed are based on the information reviewed and observations during site work. However, there may be conditions about the site that have not been disclosed by this assessment and, therefore, could not be considered.

2 SUMMARY OF PHASE 1 DESK STUDY

The Executive Summary and Conceptual Site Model presented within the Phase 1 Desk Study are reproduced below:

Site Setting

The existing Lidl store and car park occupy an irregular plot off Victoria Road to the north and Stonefield Way to the east. The existing Lidl store footprint is rectangular in shape and occupies the majority of the western zone of the site with a delivery ramp and loading bay at its southern perimeter. A Bensons for Beds store occupies an area of approximately 600m^2 in the centre of the site. The remainder of the site area forms the car park for the stores.

The proposed car park extension is located in the Bensons for Beds store, which will be demolished.

Site History

The earliest available historical maps show the site as open fields until 1960 when engineering and metallising works were developed on the site. The engineering works and metallising works buildings remained until 2021, when the site was shown in its present-day layout with the Lidl store to the west, Bensons for Beds in the centre, and the rest of the site used as car parking. The surrounding land use has been predominantly residential to the north and commercial/industrial to the east, south and west since 1960.

Geology / Hydrogeology

Published geological maps record no superficial or artificial deposits beneath the site. The bedrock is mapped as the London Clay Formation, designated as an Unproductive Strata.

Mining

The site is not located within an area that may be affected by coal mining activity.

Radon

The site is located in a Lower-Probability Radon Area, as less than 1% of properties are above the Action Level; as such, no radon protective measures are necessary.

Environmental Risk Assessment

The desk study has identified no potential contaminant linkages associated with identified sources at the site. As such, a Phase 2 Ground Investigation is not required. However, some recommendations are indicated below.

Whilst the desk study has indicated that a Phase 2 Ground Investigation is not required at the site, it would be prudent to undertake some soil samples from beneath the building post-demolition of the Bensons for Beds store for chemical analysis. This procedure will be stated within the demolition/remediation statement.

Geotechnical Assessment

As part of the demolition/remediation statement, it would be prudent to gather samples of any crushed concrete/fill to submit for geotechnical classification tests, including gradings, to ascertain suitability for re-use.

Potential Source Areas	Potential Contaminant of Concern	Pathways	Potential Receptor	Exposure Route (Human unless otherwise stated)	Potential Identified Linkage (unmitigated)	Findings of Ground Investigation	Risk (Un-mitigated)	Proposed Remediation (Mitigation) Measures	Residual Risk Estimation
<u>On-site Sources</u> **Made ground** **Metallising works** **Engineering works** **Operation as Lidl store, Benson for Beds and car parking** **<u>Off-site Sources</u>** **Engineering works** **Blue Star Garage** **Copper tubing depot/warehouse** **Metallising works** **Victoria Road industrial estate**	Asbestos / Metals As, Be, Cd, Cu, Cr (VI), Cr (III) Hg, Ni, Se, Va, Zn, *Boron, TPH /PAH, hazardous ground gases (carbon dioxide and methane)*	Disturbance due to construction plant causing direct contact, dust, and vapours. Direct Contact with occupants of the proposed development Inhalation of fibres/vapours/gases by occupants of proposed development Permeation of water supply pipework Leachate	Occupants of the development/ building fabric Adjacent residents during construction Roxbourne River	Direct Soil Ingestion	No	A ground investigation is not required.	Negligible	Negligible	Negligible
				Indoor Dust ingestion	No		Negligible	Negligible	Negligible
				Skin Contact with Soils	No		Negligible	Negligible	Negligible
				Skin Contact with Dust	No		Negligible	Negligible	Negligible
				Inhalation of Outdoor Dust	No		Negligible	Negligible	Negligible
				Inhalation of Outdoor Vapours	No		Negligible	Negligible	Negligible
				Inhalation of Indoor Vapours	No		Negligible	Negligible	Negligible
				Inhalation of ground gas	No		Negligible	Negligible	Negligible
				Inhalation of radon gas	No		Negligible	Negligible	Negligible
				Ingestion via permeated water supply pipework	No		Negligible	Negligible	Negligible
				Migration in groundwater to Roxbourne River	No		Negligible	Negligible	Negligible

Table 1: Outline Conceptual Site Model

Direct contact with subsurface soil and/or groundwater during redevelopment works are not assessed as part of the CSM. It is considered that risks to workers will be managed as part of any the redevelopment works at the site through the application of health and safety procedures, where required.

3 SITE WALKOVER

Peter Searing of Remada Ltd. took the opportunity to inspect the proposed Lidl store extension site on 17th October 2024 during the intrusive works, as recorded in the photographs below. There were no visual or olfactory indicators of contamination.

Photo 1: Looking north along the western site boundary from the site's southwest corner.

Photo 2: Looking northeast across the site from the southwest corner.

Photo 3: Stockpiles of material from the demolition of the onsite building.

Photo 4: View looking along the northern site boundary.

4 ENVIRONMENTAL & GEOTECHNICAL INVESTIGATION METHODOLOGY

4.1 Investigation Strategy

The investigation involved excavating four (4 No) trial pits (TP01-04) at locations Indicated in **Figure 2** on 17th October 2024.

Exploratory locations were selected to enable an investigation of ground conditions beneath the proposed car park, under the footprint of the previous building. The site had previously comprised a retail store that had been demolished. It was, therefore, anticipated that there would be a variable thickness of made ground at the site associated with previous developments. The primary purpose of the trial pits was to investigate the area of the former building and determine if any contamination existed.

A suitably qualified Geo-environmental Engineer logged all exploratory holes logged all exploratory holes in general accordance with the recommendations of BS5930:2015+A1:2020. Detailed descriptions, together with relevant comments, are given in the **Exploratory Hole Logs**.

The weather conditions at the site during the fieldwork period were generally warm and dry, with no standing water or slippery ground conditions being noted.

4.2 Intrusive Investigation

4.2.3 Trial Pits

All trial pits were excavated using a backhoe excavator. They were excavated while in full attendance of an experienced geo-environmental consultant. On completion of the trial pits, the materials were replaced in approximately the same order as they were excavated and compacted using the excavator.

4.3 In-Situ Testing

4.3.2 Hand Shear Vane

Hand shear vane tests were undertaken using an Impact SL810 and, in general, in accordance with the manufacturer's instructions on selected samples of cohesive soils.

4.4 Soil Sampling

4.4.1 Environmental

Made ground soils were selected by visual and olfactory means for subsequent analysis. Samples for chemical laboratory testing purposes were collected in amber glass jars, amber glass vials, and plastic tubs and retained in a cool box for transport to the laboratory.

4.6 Quality Assurance and Quality Control

All samples were submitted to a United Kingdom Accredited Laboratory (UKAS) under a completed chain of custody. The laboratory carried out its own QA/QC programme to ensure that the quality of the analytical data conformed to the appropriate test method protocols.

4.7 Laboratory Analysis & Testing

4.7.1 Chemical Analysis – Soil

Four (4 No) soil samples were scheduled for the analysis of asbestos, arsenic, barium, beryllium, cadmium, chromium (III & VI), copper, mercury, nickel, lead, selenium, zinc, fraction of organic carbon, Total Petroleum Hydrocarbons (TPHCWG), Polyaromatic Hydrocarbons (PAH), BTEX compounds (benzene, toluene, ethylbenzene, and xylene) and phenols.

The results of laboratory chemical analyses are presented in **Appendix A.**

5 GEO-ENVIRONMENTAL INVESTIGATION FINDINGS

5.1 Ground Conditions

A brief description of the published geology and a summary of the ground conditions encountered during the intrusive investigation are provided. Exploratory logs are presented at the end of the report.

5.1.1 Published Geology

The geological mapping indicates that no superficial deposits are present directly beneath the site. However, the August 2014 site investigation encountered superficial deposits.

The bedrock directly underlying the site is the London Clay Formation.

5.1.2 Made Ground

The entire investigation site comprises the footprint of the former Benson for Beds store, which has been demolished.

Made Ground was encountered within all exploratory hole locations to a depth of between 0.60m (TP03) and 0.90m (TP04) below ground level (bgl). The made ground generally comprised a dark brown gravelly sand with a moderate cobble content. Gravels consist of brick, concrete, wood, metal, slate, plastic, and flint. Cobbles were of brick and concrete.

5.1.3 Bedrock

Bedrock associated with the London Clay Formation was encountered directly below the Made Ground and comprised variably of a form to stiff, slightly sandy, silty clay, a firm sandy silt, a very soft, slightly gravelly sandy silt or stiff silty clay. within all exploratory hole locations at depths of 1.30-2.10m bgl comprising stiff silty clay. Rare selenite crystals were observed within trial pits TP03 and TP04. The London Clay Formation was encountered too the base of all exploratory hole locations to a maximum depth of 2.50m bgl

5.2 In-situ Testing

5.2.2 Hand Shear Vane

The results ranged between 60kPa (TP01 at 0.80m) and 98kPa (TP02 at 2.30m bgl).

5.3 Soil Observations

Made Ground was recovered at all locations as a heterogeneous granular material containing various man-made materials, including brick, concrete, wood, plastic, and slate.

There were no visible or olfactory indicators of contamination within the sampled soils.

5.4 Groundwater Observations

Groundwater, believed to be perched, was noted within all trial pits at depths between 0.80 and 1.70m bgl within the superficial deposits.

5.5 Chemical Analysis

5.5.1 Soils

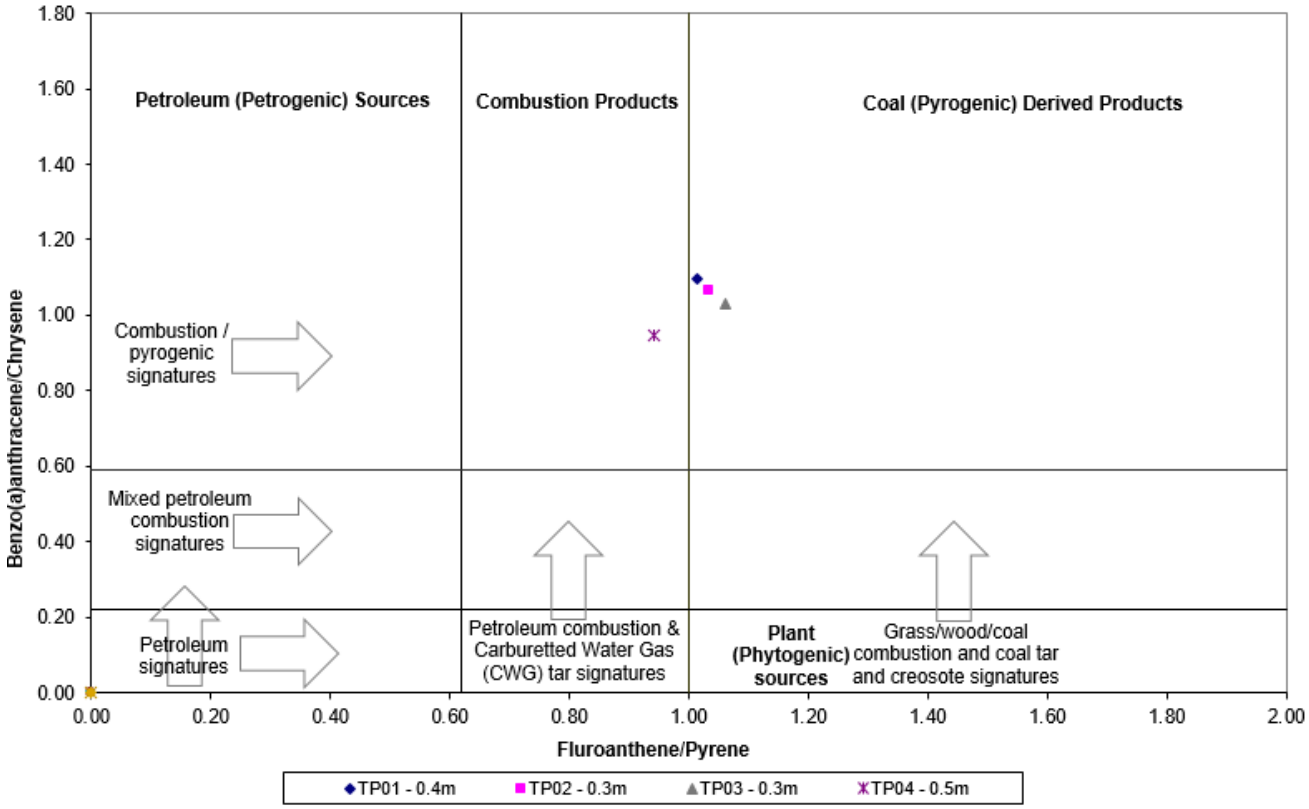
The soil chemical analysis results are presented in **Table 2** and summarised as follows.

The average FOC and pH were 0.006 and 10.9, respectively. Asbestos was detected in all the samples analysed. Loose fibres of Amosite and Chrysotile were encountered within the samples from trial pits TP01-03 with a maximum percentage by weight of 0.003% (TP03). Within TP04, Chrysotile in the form of asbestos cement was encountered with a percentage by weight of 1.197%. Detectable concentrations of metals were identified, although these are generally within the range that would typically be expected for made ground.

Concentrations of TPH were detected above the method detection limit (MDL) in all of the samples analysed. The hydrocarbons were generally heavy-end hydrocarbons within the C12 to C35 carbon range.

The total concentrations of PAHs ranged from 9.59mg/kg (TP04) to 38.6mg/kg (TP03).

In addition, the PAH concentrations were plotted using a double ratio plot to indicate the likely source of the PAHs. All of the samples that detected the four PAHs used were plotted, and all were indicated to be combustion-related PAHs, which could be associated with urban background sources.



Graph 1: PAH Double Ratio Plot

6 GENERIC QUANTITATIVE RISK ASSESSMENT

6.1 Human Health Risk Assessment

Remada has adopted the most recent Generic Assessment Criteria (GAC) published by LQM/CIEH (S4ULs) and CL:AIRE/EIC/AGS to provide an up-to-date assessment of the risks to human health. The derivation of GAC, methodology, input parameters, and technical guidance (CLEA) may be obtained upon request.

The proposed site layout is presented in **Figure 2.**

Default parameters have been adopted for sandy loam of pH 7 and commercial land use. FOC ranged from 0.0039 to 0.0074, giving a Soil Organic Matter (SOM) content range of between 0.006 and 0.0172%, with an average result of 0.0107%. In order to present a conservative assessment, the SOM content of 1% has been adopted.

The depth to potential sources of contamination for indoor air pathways has been assumed to be 0.5m below the building foundation level. The source has been conservatively assumed to be at ground level for outdoor air and direct contact pathways.

For commercial land use, the CLEA version 1.06 critical receptor is conservatively modelled as a female working adult with an exposure duration of 49 years. In accordance with the default parameters, it was assumed that employees spend most of their time indoors and that 80% of the outdoor area is covered by hardstanding. As such, the potential exposure pathways have been assumed to be:

- Direct Soil and Indoor Dust Ingestion;
- Skin contact with soils and dust;
- Inhalation of indoor and outdoor dusts and vapours.

Where GAC values for individual TPH fractions are not exceeded, the potential additive effect has been assessed by calculating each sample's overall TPH hazard index.

6.2 Comparison of Soil Analysis Results with Human Health GAC

A comparison of soil chemical analysis with GAC is presented in **Table 2**.

TPH, PAH & BTEX

None of the analytes tested were detected at concentrations that exceeded the human health GAC for on-site workers.

Metals & Inorganics Excluding Asbestos

None of the analytes tested were detected at concentrations that exceeded the human health GAC for on-site workers.

Asbestos

Asbestos was detected in all the samples selected for analysis.

Loose fibres with concentrations reading less than the MDL were encountered in trial pits TP01-02. Concentrations above the detection limits were encountered within TP03 and TP04 at 0.003% and 1.197%, respectively.

6.3 Controlled Waters Risk Assessment

6.3.1 Sensitivity – Groundwater

The site is not indicated to be within a Groundwater Source Protection Zone. The London Clay Formation bedrock underlying the site is designated as an Unproductive Strata. No groundwater abstractions are recorded within 1km of the site.

In addition, the investigation revealed that generally cohesive deposits underlie the site.

6.3.2 Sensitivity – Surface Waters

The nearest surface water feature is the Roxbourne River, 360 m northeast of the site. It enters a culvert and flows south-westerly before surfacing 400m west of the site. No surface water abstractions are recorded within 1km of the site.

6.3.4 Risk Assessment

The results of the soil chemical analysis undertaken have identified that concentrations of metals and inorganic contaminants are within the range that would be expected for 'typical' made ground. Detectable concentrations of TPH and PAHs were encountered in all samples. However, the contaminants identified are of low solubility and mobility and, as such, are unlikely to present a risk to groundwater beneath the site. Asbestos has been identified within all exploratory holes. However, no risk to human health exists as the entire site area shall be covered in hard standing, which shall block any pathway.

The groundwater was encountered at depths of between 0.80m and 1.70m bgl during the excavation of the trial pits, considered to be perched water.

Post-development, the site will continue to be covered by hardstanding. Consequently, the risk of contaminants leaching due to groundwater infiltration is limited. Therefore, the risk to controlled waters from contaminants within the made ground at the site is considered low and does not warrant further consideration at this stage.

6.5 Revised Conceptual Site Model

A revised Conceptual Site Model is presented in **Table 3** below.

6.6 Waste Classification & Waste Acceptance

Waste classification has been undertaken following the guidance set out in WM3 EA Technical Guidance 'Guidance on the classification and assessment of waste', 1st Edition, Version 1.2GB, October 2021. The results of this assessment determine the appropriate List of Waste (LoW) Code and whether the waste should be classified as hazardous or non-hazardous. Classification is undertaken using the results of solid (total) analyses and not the results of the WAC analyses.

6.6.1 Waste Classification

The assessment results indicated that contaminant concentrations within the made ground were generally low and would classify the soils as non-hazardous with LoW Code 17 05 04 (soils and stones other than those mentioned In 17 05 03). However, the elevated levels of asbestos detected within TP04 classifies the soils as hazardous with LoW Code 17 06 05.

6.7 Health & Safety Considerations

To ensure that direct exposure of construction workers involved in the site redevelopment to any impacted contaminated shallow soils is minimised, the guidance stated in HSG 66, "Protection of Workers and the General Public During Redevelopment of Contaminated Land", should be followed.

Potential Source Areas	Potential Contaminant of Concern	Pathways	Potential Receptor	Exposure Route (Human unless otherwise stated)	Potential Identified Linkage (unmitigated)	Findings of Ground Investigation	Risk (Un-mitigated)	Proposed Remediation (Mitigation) Measures	Residual Risk Estimation
<u>On-site Sources</u> **Made ground** **Metallising works** **Engineering works** **Operation as Lidl store, Benson for Beds and car parking** **<u>Off-site Sources</u>** **Engineering works** **Blue Star Garage** **Copper tubing depot/warehouse** **Metallising works** **Victoria Road industrial estate**	Asbestos / Metals As, Be, Cd, Cu, Cr (VI), Cr (III) Hg, Ni, Se, Va, Zn, *Boron, TPH /PAH, hazardous ground gases (carbon dioxide and methane)*	Disturbance due to construction plant causing direct contact, dust, and vapours. Direct Contact with occupants of the proposed development Inhalation of fibres/vapours/gases by occupants of proposed development Permeation of water supply pipework Leachate	Occupants of the development/ building fabric Adjacent residents during construction Roxbourne River	Direct Soil Ingestion	N/A for commercial land	N/A for commercial land	N/A for commercial land	N/A for commercial land	N/A for commercial land
				Indoor Dust ingestion	No	<GAC, except Asbestos fibres	Negligible	The site will be surfaced as a car park	Negligible
				Skin Contact with Soils	No		Negligible		Negligible
				Skin Contact with Dust	No		Negligible		Negligible
				Inhalation of Outdoor Dust	No		Negligible		Negligible
				Inhalation of Outdoor Vapours	No		Negligible		Negligible
				Inhalation of Indoor Vapours	No		Negligible		Negligible
				Inhalation of ground gas	No		Negligible		Negligible
				Inhalation of radon gas	No		Negligible		Negligible
				Ingestion via permeated water supply pipework	No		Negligible		Negligible
				Migration in groundwater to Roxbourne River	No		Negligible		Negligible

Table 4: Refined Conceptual Site Model

Direct contact with subsurface soil and/or groundwater during redevelopment works is not assessed as part of the CSM. Risks to workers will be managed as part of any redevelopment works at the site through the application of health and safety procedures, where required.

7 CONCLUSIONS & RECOMMENDATIONS

7.1 Conclusions

The following conclusions have been made based on the findings of this investigation.

7.1.1 Phase 2 Site Investigation

The site included engineering and metallising works and, latterly, a Benson for Beds store, which had recently been demolished at the time of the investigation.

A variable thickness of made ground was encountered beneath the site which varied from between 0.6 and 0.9m in thickness. The made ground was generally granular and contained fragments of concrete, brick, metal, plastic, wood, slate and flint.

Bedrock geology was found to comprise silty clay or sandy silt. The bedrock has been interpreted as the London Clay Formation, which is classified as an unproductive strata.

7.1.2 Human Health Risk Assessment

The results of soil chemical analysis were compared to the Human Health Generic Assessment Criteria for commercial land use. While elevated levels of asbestos were encountered, they do not pose a risk to human health as the entire site will be covered in hardstanding, breaking the source pathway receptor model.

7.1.3 Water Resources Risk Assessment

The results of the soil chemical analysis undertaken have identified that concentrations of metals and inorganic contaminants are within the range typical of made ground. Detectable concentrations of TPH and PAHs were encountered in all samples. However, the contaminants identified are of low solubility and mobility and, as such, are unlikely to present a risk to groundwater beneath the site. In addition, it should be noted that the site will be covered with hardstanding. Therefore, the risk of leaching of contaminants as a result of infiltration of groundwater is likely to be limited. In addition, the underlying soils are cohesive, which will further limit the migration of contaminants. The bedrock is recorded as an unproductive strata. Therefore, the risk to groundwater from contaminants within the made ground at the site is considered low and does not warrant further consideration.

7.1.4 Waste Classification

In general, the results of the chemical analysis indicate that the material would be classified as hazardous waste due to the presence of elevated asbestos fibres.

7.2 Recommendations

A watching brief for visible ACMs should be carried out during excavation works.

STUDY LIMITATIONS

IMPORTANT. This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Remada, Ltd with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with (the 'Client'). Remada does not accept responsibility for any matters outside the agreed scope.

2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.

3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Remada is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have published, more stringent objectives. Further work may be required by these parties.

4. All work carried out in preparing this report has used, and is based on, Remada' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice pending changes in legislation, of which Remada is aware, have been considered. Following delivery of the report Remada has no obligation to advise the Client or any other party of such changes or their repercussions.

5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6. Whilst this report and the opinions made are to the best of Remada' belief, Remada cannot guarantee the accuracy or completeness of any information provided by third parties.

7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have received.

8. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the site since the time of the investigation.

9. The content of this report represents the professional opinion of experienced environmental consultants. Remada does not provide specialist legal or other professional advice. The advice of other professionals may be required.

10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.

11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on site.

12. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

13. Unless otherwise stated, samples from the site (soil, groundwater, building fabric or other samples) have NOT been analysed or assessed for waste classification purposes.

TABLES (not presented within text).

Table 2: Comparison of Soil Chemical Analyses with GAC

			Lab Sample Number:	**Commercial GAC 1.0% SOM**	**Commercial GAC 2.5% SOM**	353134	353135	353136	353137
			Sample Reference:			TP01	TP02	TP03	TP04
			Borehole:			None Supplied	None Supplied	None Supplied	None Supplied
			Top Depth (m):			0.4	0.3	0.3	0.5
			Basal Depth (m):			17/10/2024	17/10/2024	17/10/2024	17/10/2024
			Date Sampled:			None Supplied	None Supplied	None Supplied	None Supplied
Determinand	**Units**	**Limit of detection**	**Accreditation Status**	**[mg/kg unless stated]**	**[mg/kg unless stated]**				
Moisture	**%**	**0.01**	**NONE**		-	8.6	9.8	7.4	8.9
Asbestos in Soil	**Type**	**N/A**	**ISO 17025**		-	Detected	Detected	Detected	Detected
Asbestos Analyst ID	**N/A**	**N/A**	**N/A**		-	KWB	KWB	KWB	KWB
Asbestos % by hand picking/weighing	**%**					< 0.001	< 0.001	0.00300	1.19700
Asbestos Containing Material Types Detected (ACM	Type								
pH	**pH Units**	**N/A**	**MCERTS**		-	10.7	11.6	10.4	10.8
Arsenic	mg/kg	1.00	MCERTS	640	640	10	8.5	16	12
Beryllium	mg/kg	0.06	MCERTS	12	12	0.52	0.57	0.85	0.73
Boron	mg/kg	0.20	MCERTS	240000	240000	1.3	1	2.1	3.9
Cadmium	mg/kg	0.20	MCERTS	190	190	0.3	0.3	< 0.2	0.4
Chromium (Hexavalent)	mg/kg	1.80	MCERTS	33	33	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (Trivalent)	mg/kg	1.00	NONE	8600	8600	16	19	27	23
Chromium (aqua regia extractable)	mg/kg	1.00	MCERTS	-	-	16	20	27	23
Copper	mg/kg	1.00	MCERTS	68000	68000	19	20	34	30
Lead	mg/kg	1.00	MCERTS	NC	NC	58	48	140	92
Mercury	mg/kg	0.30	MCERTS	58[vap] (25.8)	58[vap] (25.8)	< 0.3	< 0.3	0.4	0.3
Nickel	mg/kg	1.00	MCERTS	980	980	12	12	18	18
Selenium	mg/kg	1.00	MCERTS	12000	12000	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	mg/kg	1.00	MCERTS	9000	9000	31	33	47	41
Zinc	mg/kg	1.00	MCERTS	730000	730000	81	69	110	140
Total Cyanide	mg/kg	1.00	MCERTS		-	< 1.0	< 1.0	< 1.0	< 1.0
Fraction Organic Carbon (FOC)	**N/A**	**0.001**	**MCERTS**		-	0.0074	0.0039	0.0063	0.0074
Calculated TOC from FOC	-	-	-		-	*0.74*	*0.39*	*0.63*	*0.74*
Calculated SOM from FOC	-	-	-		-	*0.0127*	*0.0067*	*0.0108*	*0.0127*
Aliphatic TPH >C5-C6	mg/kg	0.01	NONE	3200[sol] (304)	5900sol (558)	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	mg/kg	0.01	NONE	7800[sol] (144)	17000sol (322)	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	mg/kg	0.01	NONE	2000[sol] (78)	4800vap (190)	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C10-C12	mg/kg	1.00	MCERTS	9700[sol] (48)	23000vap (118)	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	mg/kg	2.00	MCERTS	59000[sol] (24)	82000sol (59)	5.5	2.9	2.3	4.9
Aliphatic TPH >C16-C21	mg/kg	8.00	MCERTS	1600000	1700000	22	< 8.0	< 8.0	21
Aliphatic TPH >C21-C35	mg/kg	8.00	MCERTS			120	41	41	160
Total Aliphatic Hydrocarbons:	**mg/kg**	**10.00**	**NONE**		-	**140**	**44**	**43**	**180**
Aromatic TPH >C5-C7	mg/kg	0.01	NONE	26000[sol] (1220)	46000sol (2260)	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	mg/kg	0.01	NONE	56000[vap] (869)	110000sol (1920)	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	mg/kg	0.02	NONE	3500[vap] (613)	8100vap (1500)	< 0.020	< 0.020	< 0.020	< 0.020
Aromatic TPH >C10-C12	mg/kg	1.00	MCERTS	16000[sol] (364)	28000sol (899)	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	mg/kg	2.00	MCERTS	36000[sol] (169)	37000	4	< 2.0	3.4	6
Aromatic TPH >C16-C21	mg/kg	10.00	MCERTS	28000	28000	29	11	19	21
Aromatic TPH >C21-C35	mg/kg	10.00	MCERTS	28000	28000	100	36	68	110
Total Aromatic Hydrocarbons	**mg/kg**	**10.00**	**NONE**		-	**130**	**47**	**91**	**140**
Calculated Sum TPH (sum Aliphatic + sum Aromatic)						***270***	***91***	***134***	***320***
Naphthalene	mg/kg	0.05	MCERTS	190[sol] (76.4)	460sol (183)	0.06	< 0.05	0.06	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	83000[sol] (86.1)	97000sol (212)	0.18	0.11	0.19	0.08
Acenaphthene	mg/kg	0.05	MCERTS	84000[sol] (57)	97000sol (141)	0.13	< 0.05	0.1	< 0.05
Fluorene	mg/kg	0.05	MCERTS	63000[sol] (30.9)	68000	0.09	< 0.05	0.07	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	22000	22000	2.5	1.1	2.5	0.63
Anthracene	mg/kg	0.05	MCERTS	520000	540000	0.58	0.27	0.69	0.14
Fluoranthene	mg/kg	0.05	MCERTS	23000	23000	7.3	3.1	6.8	1.6
Pyrene	mg/kg	0.05	MCERTS	54000	54000	7.2	3	6.4	1.7
Benzo[a]anthracene	mg/kg	0.05	MCERTS	170	170	3.4	1.6	3.6	0.9
Chrysene	mg/kg	0.05	MCERTS	350	350	3.1	1.5	3.5	0.95
Benzo[b]fluoranthene	mg/kg	0.05	ISO 17025	44	45	3.8	1.8	4.4	1.1
Benzo[k]fluoranthene	mg/kg	0.05	ISO 17025	1200	1200	1.8	0.93	2.6	0.44
Benzo[a]pyrene	mg/kg	0.05	MCERTS	35	35	3.3	1.6	3.8	0.9
Indeno(1,2,3-c,d)Pyrene	mg/kg	0.05	MCERTS	500	510	1.6	0.77	1.6	0.47
Dibenz(a,h)Anthracene	mg/kg	0.05	MCERTS	3.5	3.6	0.36	0.19	0.38	0.13
Benzo[g,h,i]perylene	mg/kg	0.05	MCERTS	3900	4000	1.9	0.87	1.9	0.5
Coronene	mg/kg	0.05	NONE						
Total Of 16 PAH's	**mg/kg**	**0.8**	**ISO 17025**		-	**37.2**	**16.8**	**38.6**	**9.59**
Total Of 17 PAH's	**mg/kg**	**0.85**	**ISO 17025**						
Benzene	µg/kg	5.00	MCERTS	27	47*	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5.00	MCERTS	56000[vap] (869)	110000vap (1920)*	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5.00	MCERTS	5700[vap] (518)	13000vap (1220)*	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5.00	MCERTS	5900[sol] (576)	14000sol (1350)*	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5.00	MCERTS	6600[sol] (478)	15000sol (1120)*	< 8.0	< 8.0	< 8.0	< 8.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5.00	NONE		13000	< 5.0	< 5.0	< 5.0	< 5.0
Total Phenols	mg/kg	1.00	MCERTS	440[dir] 26000)	690dir (30000)	< 1.0	< 1.0	< 1.0	< 1.0

Determinand concentration below the GAC

Determinand concentration in exceedance of GAC

Determinand concentration in exceedance of the vapour/solubility saturation limit.

NC: No published criteria, U/S: Unsuitable sample.

vap: Screening criteria presented exceed the vapour saturation limit, which is presented in brackets.

sol: Screening criteria presented exceed the solubility saturation limit, which is presented in brackets.

dir: Screening criteria based on threshold protective of direct skin contact (guideline in brackets based on health effects following long term exposure provided for illustration only).

(1): For assessment based on the use of the surrogate marker approach the GAC for Coal Tar must be used instead of benzo(a)pyrene.

** Value presented in mg/kg*

FIGURES

Notes

Promap
LANDMARK INFORMATION

Plotted Scale - 1:50000. Paper Size – A4

Project Title: Lidl, Victoria Road, Ruislip	Scale: as shown	Drawn: DW	Size: A4
Drawing Title: Site Location Plan	Date: 10.02.22	Job No.: 952.01	Drawing /Rev No.: Fig1
Client: Lidl Great Britain Ltd			Remada

Legend

TP01 Trial Pit

Notes

Site plan taken from KLH Architects drawing 4908-0104 P11

Topographical survey reproduced from EDI Surveys Lrd drawing 20336/T/01-01

Revision	Approved	Date

Project Title

Lidl Victoria Road Ruislip

Drawing Title

Existing and proposed layout with exploratory holes

Client

Lidl Great Britain Ltd

Scale	Drawn	Size
NTS	PS	A4
Date	Job No.	Figure No.
29.10.22	952.03	02

REMADA GEO CONSULTANTS

EXPLORATORY HOLE LOGS

Trial Pit Log

Project Name: Lidl Ruislip	Client: Lidl Great Britain Ltd	Date: 17/10/2024
Location: Ruislip	Contractor:	Co-ords: E512170.00 N185607.00
Project No. : 952.03	Crew Name:	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP01	TP		UK	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40	ES					MADE GROUND: Dark brown gravelly sand with moderate cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete, wood, metal and flint. Cobbles are angular to subangular of brick and concrete.
		0.80		HVP=60	0.70			Firm brown mottled light grey slightly sandy silty CLAY.
	▼	1.40		HVP=70				
		2.00		HVP=72	1.70			Firm to stiff grey mottled orangeish brown silty CLAY
					2.30			End of Borehole at 2.300m

1 2 3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.50	0.60	Stable					

Remarks

1. Groundwater encountered at 0.95m bgl.
2. Backfilled using arisings.

Trial Pit Log

Project Name: Lidl Ruislip	Client: Lidl Great Britain Ltd	Date: 17/10/2024
Location: Ruislip	Contractor:	Co-ords: E512164.00 N185589.00
Project No. : 952.03	Crew Name:	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP02	TP		UK	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					MADE GROUND: Dark brown gravelly sand with moderate cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete, slate, wood and plastic. Cobbles are angular to subangular of brick and concrete.
					0.70			
		0.82		HVP=70				Firm to stiff greenish grey slightly sandy silty CLAY with rare rootlets.
					0.90			Firm brown mottled grey slightly sandy silty CLAY.
								Occasional pockets of sand (encountered from 1m to 1.3m bgl).
	▼	1.40		HVP=74				
					2.10			Stiff bluish grey occasional mottled greyish brown silty CLAY.
		2.30		HVP=98				
					2.50			End of Borehole at 2.500m

1 2 3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.80	0.60	Stable					

Remarks

1. Groundwater encountered at 1.4m bgl.
2. Backfilled using arisings.

Trial Pit Log

Project Name: Lidl Ruislip	Client: Lidl Great Britain Ltd	Date: 17/10/2024
Location: Ruislip	Contractor:	Co-ords: E512159.00 N185577.00
Project No. : 952.03	Crew Name:	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP03	TP		UK	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					MADE GROUND: Dark brown gravelly sand with moderate cobble content. Gravel is angular to subrounded fine to coarse of brick concrete, slate, wood and plastic. Cobbles are angular to subangular of brick and concrete.
					0.60			Firm to stiff greenish grey slightly sandy silty CLAY with rare rootlets.
		0.75		HVP=70				
		0.95		HVP=74	0.90			Firm brown mottled grey slightly sandy silty CLAY with rare selenite crystals (up to 1mm in size).
	▼				1.70			Very soft brown slightly gravelly sandy SILT. Gravel is subangular to subrounded fine to coarse flint.
		2.20		HVP=84	2.10			Stiff dark reddish grey mottled dark orangeish brown silty CLAY with rare selenite crystals (up to 1mm in size).
					2.50			End of Borehole at 2.500m

1 2 3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.30	0.60	Stable					

Remarks

1. Groundwater encountered at 1.7m bgl.
2. Backfilled using arisings.

Trial Pit Log

Project Name: Lidl Ruislip	Client: Lidl Great Britain Ltd	Date: 17/10/2024
Location: Ruislip	Contractor:	Co-ords: E512152.00 N185594.00
Project No. : 952.03	Crew Name:	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP04	TP		UK	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	ES					MADE GROUND: Dark brown gravelly sand with moderate cobble content. Gravel is angular to subrounded fine to coarse of brick, concrete, slate, wood, plastic and metals. Cobbles are angular to subangular of brick and concrete.
	▼				0.90			
		0.95		HVP=69				Firm brown sandy SILT.
					1.10			Very soft brown slightly gravelly sandy SILT. Gravel is subangular to subrounded fine to coarse flint
					1.30			Stiff dark reddish grey mottle orangeish grey silty CLAY with rare selenite crystals (up to 1mm in size).
		2.30		HVP=89				
					2.50			End of Borehole at 2.500m

1 2 3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.90	0.60	Stable					

Remarks

1. Groundwater encountered at 0.8m bgl.
2. Backfilled using arisings.

APPENDIX A

Laboratory Chemical Analysis

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Watford,
Herts,
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Analytical Report Number : 24-048716

Project / Site name:	Lidl Ruislip	**Samples received on:**	18/10/2024
Your job number:	952 03	**Samples instructed on/ Analysis started on:**	18/10/2024
Your order number:	952 03	**Analysis completed by:**	28/10/2024
Report Issue Number:	1	**Report issued on:**	28/10/2024
Samples Analysed:	4 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-048716
Project / Site name: Lidl Ruislip
Your Order No: 952 03

Lab Sample Number				353134	353135	353136	353137
Sample Reference				TP01	TP02	TP03	TP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.30	0.50
Date Sampled				17/10/2024	17/10/2024	17/10/2024	17/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	60.7	70.4	< 0.1
Moisture Content	%	0.01	NONE	8.6	9.8	7.4	8.9
Total mass of sample received	kg	0.1	NONE	0.7	0.5	0.7	0.7
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	KWB	KWB
Actinolite detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Amosite detected	Type	N/A	ISO 17025	Detected	Not-detected	Detected	Not-detected
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Detected
Crocidolite detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Tremolite detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos % by hand picking/weighing	%	0.001	ISO 17025	< 0.001	< 0.001	0.003	1.197
Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Loose Fibres	Loose Fibres	Loose Fibres	Asbestos Cement
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	10.7	11.6	10.4	10.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0074	0.0039	0.0063	0.0074
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	0.06	< 0.05	0.06	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.18	0.11	0.19	0.08
Acenaphthene	mg/kg	0.05	MCERTS	0.13	< 0.05	0.1	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.07	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.5	1.1	2.5	0.63
Anthracene	mg/kg	0.05	MCERTS	0.58	0.27	0.69	0.14
Fluoranthene	mg/kg	0.05	MCERTS	7.3	3.1	6.8	1.6
Pyrene	mg/kg	0.05	MCERTS	7.2	3	6.4	1.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.4	1.6	3.6	0.9
Chrysene	mg/kg	0.05	MCERTS	3.1	1.5	3.5	0.95
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.8	1.8	4.4	1.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.8	0.93	2.6	0.44
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.3	1.6	3.8	0.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6	0.77	1.6	0.47
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.36	0.19	0.38	0.13
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.9	0.87	1.9	0.5
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	37.2	16.8	38.6	9.59

Analytical Report Number: 24-048716
Project / Site name: Lidl Ruislip
Your Order No: 952 03

Lab Sample Number				353134	353135	353136	353137
Sample Reference				TP01	TP02	TP03	TP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.30	0.50
Date Sampled				17/10/2024	17/10/2024	17/10/2024	17/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	8.5	16	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.52	0.57	0.85	0.73
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1	2.1	3.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.3	< 0.2	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	16	19	27	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	20	27	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	20	34	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	48	140	92
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	12	18	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	33	47	41
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	81	69	110	140
Petroleum Hydrocarbons							
TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	5.5	2.9	2.3	4.9
TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	22	< 8.0	< 8.0	21
TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	120	41	41	160
TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	140	44	43	180
TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	4	< 2.0	3.4	6
TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	29	11	19	21
TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	100	36	68	110
TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	130	47	91	140
VOCs							
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Project / Site name: Lidl Ruislip
Your Order No: 952 03

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
353134	TP01	0.40	186	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
353135	TP02	0.30	182	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
353136	TP03	0.30	123	Loose Fibres	**Amosite & Chrysotile**	0.003	**0.003**
353137	TP04	0.50	140	Asbestos Cement	**Chrysotile**	1.197	**1.197**

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

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
353134	TP01	None Supplied	0.4	Brown loam and sand with gravel and vegetation
353135	TP02	None Supplied	0.3	Brown loam and sand with stones
353136	TP03	None Supplied	0.3	Brown loam and sand with stones
353137	TP04	None Supplied	0.5	Brown loam and sand with gravel

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS

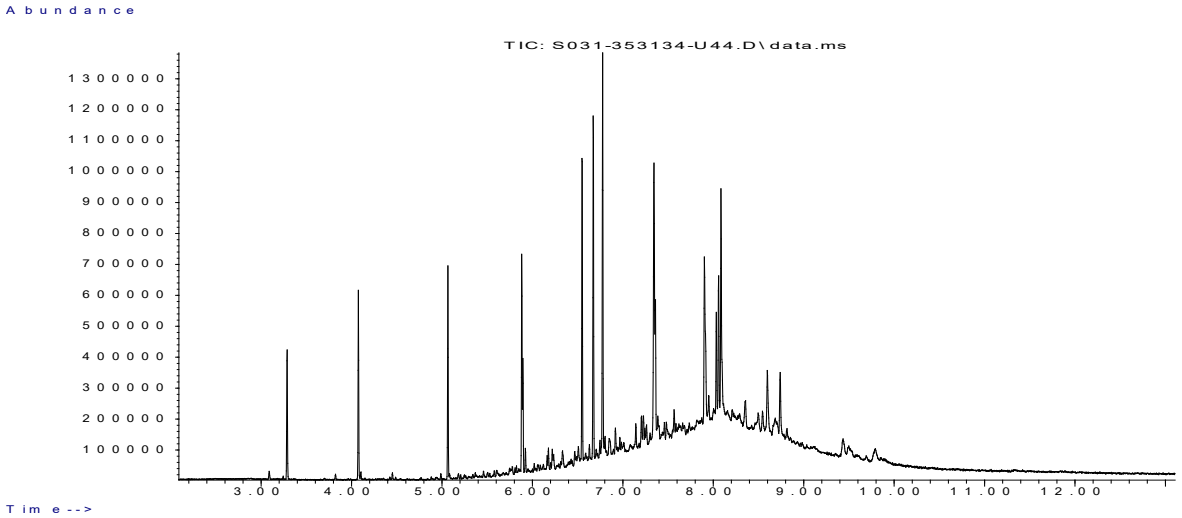
For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution


Abundance
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