This matter is being dealt with by
Brian Mullin

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Planning Department,
Rutland County Council
Catmose House
Catmos Street
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Rutland
LE15 6HP

Our ref: 1600529.1
Your ref: PP-13004793

25th April 2024

Dear Planning,

The Town and Country Planning (General Permitted Development) (Amendment and Consequential Provisions) (England) Order 2015 (as amended)

SCHEDULE 2, PART 3, CLASS MA PRIOR APPROVAL FOR THE CONVERSION OF FORMER OFFICE SPACE TO NO. 15 RESIDENTIAL UNITS COMPRISING 9 ONE-BED UNITS AND 6 TWO-BED UNITS (CLASS C3)

At Burley Appliances Ltd, Lands End Way, Oakham, Rutland, LE15 6RB

Introduction

1. We write on behalf of Burley Appliances Ltd ("the Applicant") and can confirm submission of the above application for prior approval under Schedule 2, Part 3, Class MA of the General Permitted Development (Amendment and Consequential Provisions) Order 2015 ("the Order") to Rutland County Council ("The Council") via the Planning Portal today.

2. The submission is supported by the following drawings and documents, prepared by Marrons unless otherwise stated:

- Location Plan
- Site Plan, drawing no. 1600529.2.11 rev A
- Existing Ground Floor Plan, drawing no. 1600529.2.15
- Existing First Floor Plan, drawing no. 1600529.2.16
- Existing Elevations, drawing no. 1600529.2.17
- Proposed Ground Floor Plan, drawing no. 1600529.2.18 rev B
- Proposed First Floor Plan, drawing no. 1600529.2.19
- Proposed Elevations, drawing no. 1600529.2.20
- Noise Assessment, prepared by Sharps Acoustics
- Daylight and Sunlight Assessment, prepared by Stroma Built Environment
- Structural Survey, prepared by PRP

- CIL Form 1

3. A Phase 2 Contaminated Land Report was submitted to the LPA as part of the live outline planning application for the wider site (LPA Ref: 2023/0767/OUT). In response to this Report, consultee comments from Environmental Health were received on 14th August 2023, confirming that they were *"satisfied that the Phase II Ground Investigation by M-EC has not identified any contaminants within the underlying soils that may pose a risk to the future users of the site"*. The Phase 2 Report has been appended to this Letter for reference, as the red line of this application is within the survey area covered in the aforementioned Report.

4. Arrangements have been made for the Applicant to pay the associated application fee of £1,875.00 plus the service charge of £70.00, which is the correct fee for an application of this type and the number of units proposed.

Site Description

5. The application site is located to the north of the 'Main Town' of Oakham (as designated in the adopted Development Plan) and consists of two existing office units. The northern-most unit is single storey, whilst the other unit is two-storey. Both of these buildings were previously utilised by the Applicant as office space.

6. The two-storey unit is set back approximately 11.5m from Lands End Way, whilst the single-storey unit is set back by 48m. The units form part of the wider Burley Appliances Ltd site with access provided via the entrance on the eastern side of Lands End Way.

7. To the north, the site is bound by Sentura House (an existing commercial building), whilst immediately to the south of the application site is the current Burley Appliances manufacturing unit (Use Class B2), albeit this is due to be demolished. To the east of the site is a railway track, separated from the buildings on the application site by an area of grassland and an established vegetation buffer. Finally, to the west on the opposite side of the highway sits the newly completed 'Farriers Reach' residential development by Allison Homes.

8. The development site sits within Flood Zone 1 where there is a low probability of flooding. There are a number of existing trees on the application site but due to the nature of the proposals as conversion of the existing buildings, there will be no adverse impacts arising.

Background

9. The aforementioned adjacent Burley Appliances Ltd manufacturing unit is no longer fit for purpose. The building is oversized for the work carried out by the business and it is in need of a significant repair programme. Consequently, demolition of the building is the only feasible option and there is an extant permission to demolish the structure (LPA ref: 2022/0537/DMP). A replacement employment building will be located to the northeast

corner of the Applicant's landholding, and it is intended that a pre-application enquiry is submitted to this effect shortly.

10. This Class MA proposal to change the use of the building to residential will make effective use of two existing buildings and their associated curtilage, contributing towards the Council's supply of housing. It would also ensure the release of capital to enable the Applicant to build a fit for purpose replacement B2 unit to the northeast corner of the existing site.

i. Planning History

11. The application site already benefits from an extant permission to convert the two existing buildings to residential use under Class MA (LPA Ref: 2022/0741/PED). This application does not propose any alterations to the previously approved units themselves, with the only amendment sought under this submission being the red line. The red line has been expanded in this submission to include all of the curtilage associated with the two existing buildings.

The Proposal

12. Prior approval is sought for the conversion of the existing office space to 15no. residential units, comprising of 9 one-bed units and 6 two-bed units (Class C3). The proposed units all exceed the adopted National Space Standards, as demonstrated within the Schedule of Accommodation below (Table 1).

Unit No.	No. of Beds & No. Persons	National Space Standard (sq.m.)	Unit Size (sq.m.)
1	1B2P	50	54
2	1B2P	50	57
3	1B2P	50	72
4	2B4P	70	91
5	2B4P	70	88
6	1B2P	50	56
7	1B2P	50	60
8	1B2P	50	58
9	1B2P	50	74
10	2B4P	70	91
11	2B4P	70	92
12	1B2P	50	63
13	1B2P	50	78
14	2B4P	70	93
15	2B4P	70	120

Table 1 – National Space Standards compared with the unit sizes proposed.

13. To ensure that all habitable rooms receive adequate natural light, all habitable rooms are served by a minimum of No. 1 window.

14. As stated at paragraph 11 above, the red line for this submission includes the entirety of the curtilage associated with the two buildings. Whilst there is no set definition of curtilage (particularly for non-residential buildings), there is case law to suggest that the *"part and parcel"* test should be applied. *R (Hampshire County Council) v Secretary of State for Environment, Food and Rural Affairs*[1], challenges the approach taken by the Inspector in *Hiley v The Secretary of State for Levelling Up, Housing And Communities & Anor*[2] in determining the curtilage of an industrial premises. The Inspector refused an Appeal made in relation to a certificate of lawfulness under Part 7, Class H of the GPDO for the proposed construction of a workshop/storage building with associated hardstanding in respect of an existing industrial facility at a Business Park.

15. As summarised by HCR Law, *"such permitted development rights require the development to be 'within the curtilage of an existing industrial building or warehouse'. Developments were set to take place on a field immediately to the north of the business park (in the same ownership) with a large pond and interceptor channel used for surface water drainage from the business park warehouse buildings. Drainage pipes connect the business park buildings to the pond and interceptor channel; the field is bounded by trees and hedging, with a 20m+ gap in the hedge on the field's southern boundary (affording access between the business park and the field), plus a gap in the hedge on the field's northern boundary.*

    The inspector's decision referred to curtilage being 'a feature constrained to a small area about a building; apparently in 'intimate association' with such building' and that 'no physical enclosure is necessary to define it, but the considered land must be part of the enclosure with the house'. Given the striking difference in character and appearance between the field and the business park, and the physical barrier between the two sites – in the form of the hedgerows and gated access – the subject land is physically separate from the main industrial/warehouse use and not part of its curtilage".

16. The Inspector's decision was subsequently challenged and quashed by Mr Justice Julian Knowles, who found that the Inspector had misdirected himself in law as to the relevant test and material considerations in the determination of the curtilage for the business park. The Judge stated that the relevant test was that for *"one hereditament to fall within the curtilage of another, the former must be so intimately associated with the latter as to lead to the conclusion that the former in truth forms part and parcel of the latter"*.

17. HCR Law continues in their summary of the Court of Appeal case, highlighting some key relevant and non-relevant considerations to the 'part and parcel' test:

[1] *R (Hampshire County Council) v Secretary of State for Environment, Food and Rural Affairs* [2022] QB 103
[2] *Hiley v The Secretary of State for Levelling Up, Housing And Communities & Anor [2022]* EWHC 1289 (Admin)

- *"Relevant but not determinative nor exhaustive will be (i) the physical layout of the premises; (ii) their ownership (past and present) and (iii) their use or function (past and present);*
- *Functional equivalence or functional interdependence is irrelevant;*
- *The test is not whether the building and land fall within a single enclosure;*
- *'Smallness' is not inherent in curtilage; there is no test that a curtilage must be 'small', but that does not mean that relative size is an irrelevant consideration;*
- *The 'curtilage' of a building is a different concept from 'the planning unit'. The land does not have to be 'ancillary' to the building in order to fall within its curtilage, although whether it is ancillary is relevant and may be highly relevant".*

18. Figure 1 below is an aerial photograph of the site, which demonstrates both a visual and physical relationship between the land identified as within the application site (i.e. the curtilage), and the buildings themselves. The curtilage area identified includes several vehicular parking areas (surfaced in hardstanding), as well as a worn path between the north-eastern corner of the site and the buildings in question. Some vehicular track marks are visible within the grassed area around the northern-most building, from a ride-on mower. The *"part and parcel"* test is therefore met by the proposals.

Figure 1 – Aerial image of the site depicting the curtilage area of the two buildings, with a rough red line for the application drawn on for reference.

Class MA Assessment

19. Having regard to Class MA of the Order, permitted development consists of:

> *"Development consisting of a change of use of a building and any land within its curtilage from a use falling within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order to a use falling within Class C3 (dwellinghouses) of Schedule 1 to that Order".*

Section MA.1 Assessment

20. It is considered that the development, which aims to convert the office space to residential use, forms Class MA development, and the Council is asked to give a determination as to whether prior approval is required, having regard to the following factors:

a. The buildings have been vacant for a period of in excess of 3 months, in accordance with section 1(a).

b. The buildings to be converted have been utilised as office space for in excess of 10 years, falling under Class E. The proposals are therefore in accordance with sections 1(b) and 2.

c. The floor space of the existing buildings changing use under Class MA is less than 1,500sq.m at approximately 1,444sq.m, in accordance with section 1(c).

d. The application site is not article 2(3) land, nor is it a site of special scientific interest, a safety hazard area, a military explosives storage area, a scheduled monument or a listed building, in accordance with sections 1(d) and 1(e).

e. The application site is not occupied under an agricultural tenancy, nor is it under an article 4(1) direction, so sections 1(f) and 1(g) are not of relevance.

21. As set out above, the proposed conversion falls within permitted development as defined by Schedule 2, Part 3, Class MA.1 of the GPDO.

Section MA.2 Assessment

22. It is considered that the proposed development demonstrably meets the conditions set out Section MA.2 of the Order, for the following reasons:

a) Transport impacts of the development

23. The location of the development, within Oakham on a key route in and out of the area, entails that there are an abundance of public transport options available to future residents to include travel by bus and train. In addition, all essential day-to-day facilities and services are within walking distance, to include Lidl *circa.* 105m to the south of the site entrance and

Aldi *circa*. 620m to the north. There is parking available on site; 16no. spaces have been illustrated on the submitted Site Plan, albeit there is an abundance of additional hardstanding available for such use if required. The site benefits from an existing and established access point off Lands End Way, and the intensity of use of this access is not expected to increase as a result of the proposals.

24. There is no evidence to suggest that there is an existing road safety problem which requires mitigation. The conversion of the buildings to residential use can therefore come forward due to the sustainability of the location where future residents would have a legible access route to the heart of the town centre, through walking, cycling or public transport.

25. Accordingly, the proposed scheme would not prejudice the safe or efficient use of the public highway, in accordance with criterion 2(a) of this section.

b) Contamination risks on site

26. The Stage 1 Contaminated Land Report prepared by Castledine Environmental that accompanied the previous Class MA application concluded that the risks posed by the in-situ land quality were 'low'. As part of a subsequent outline planning application to redevelop the whole site for 61 dwellings (LPA Ref: 2023/0767/OUT), a Phase II Contaminated Land Report was prepared by M-EC which found there to be no contamination issues on the wider site either (Appendix 1).

27. It has therefore been demonstrated that the conversion of the buildings can come forward safely and residential units can be occupied as the site would be free from risks to human health, in accordance with criterion 2(b) of this section.

c) Flooding risks on the site

28. According to the Environment Agency's Flood Map, the site is located within Flood Zone 1, meaning the site is at the lowest risk of flooding.

29. Overall, the development is not considered to incur unacceptable flood risk impacts due to the nature of the proposals as a conversion scheme, whereby existing drainage infrastructure will be utilised. The proposals are therefore in accordance with criterion 2(c) of this section.

d) Impacts of noise from commercial premises

30. Future residents will not be exposed to unacceptable noise pollution from the outside environment, from surrounding land uses nor highway traffic. Notwithstanding this, within the context of the GPDO, the proposals only fall to be considered against the impacts of noise from commercial premises on the intended occupiers of the development. The buildings on site are no longer in use, so would not produce an adverse noise environment for future occupiers. This is confirmed within the accompanying Noise Impact Assessment

prepared by Sharps Acoustics. The proposed development therefore meets criterion 2(d) of this section.

e) Impact on Conservation Area

31. The application site is not located within a Conservation Area, and therefore criterion 2(e) of this section is not of relevance to this application.

f) Adequate natural light in habitable rooms

32. The scheme has been designed to offer a quality living environment for future residents. All habitable rooms will be served by at least one window to maximise natural light, and a detailed Daylight Sunlight Assessment has been carried out and used to inform the internal layout of the proposals. As confirmed in the attached report, reasonable levels of light have been achieved in each habitable room in accordance with Criterion 2(f) of this section.

g) Introduction of residential use

33. The development will create a safe place for future occupiers to reside as it is located in proximity to other residential accommodation and along a busy pedestrian route with links to town centre services and facilities. Notwithstanding this, the site is not located within an area *"important for general or heavy industry, waste management, storage and distribution"* and accordingly, criterion 2(g) of this section is not of relevance to this application. It should be noted that the Applicant is happy for the demolition of the factory unit approved under ref: 2022/0537/DMP to be implemented prior to the occupation of the proposed residential units.

h) Loss of services

34. The site is not a registered nursery or health centre, and therefore criterion 2(h) is not of relevance.

National Planning Policy Framework (December 2023)

i) Principle of the Development

35. The acceptability of the principle of development for the proposed conversion is also enshrined within paragraph 124(d) of the updated National Planning Policy Framework ("the Framework"). It states that planning policies and decisions should promote and support the development of under-utilised land and buildings.

36. The proposal is considered to be demonstrably compliant with paragraph 124(d) of the NPPF as the development will re-use two redundant buildings. In light of this, and the current primacy of paragraph 124 of the Framework, it is considered evident that the proposal is acceptable in principle. This is further established through the granting of the previous Class MA application onsite (LPA Ref: 2022/0741/PED).

Conclusions

37. The proposals will repurpose redundant office space, in line with national Government policy. Furthermore, the development would result in more people residing in proximity to the 'Main Town' centre of Oakham where services and facilities are easily accessible through an abundance of sustainable transport modes.

38. For the change of use to proceed, there are no external alterations required to the building and nor are there any changes to any fixed surface structures within the site. In light of the foregoing, it is considered that the proposals accord with Class MA of the Town and Country Planning (General Permitted Development) (Amendment and Consequential Provisions) (England) Order 2015 ("the Order") and that prior approval should be granted without delay. The granting of the previous Class MA application on site (LPA Ref: 2022/0741/PED) has established the principle of the development.

39. If you require any clarification or additional information, please do not hesitate to contact Brian Mullin or Megan Simpson using the details below.

Yours sincerely

[redacted]

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APPENDIX 1 – Phase 2 Contaminated Land Report submitted in support of Outline Planning Application Ref: 2023/0767/OUT

MEC
Development Technical Consultants

GEO ENVIRONMENTAL

Burley Appliances, Lands End Way, Oakham
Phase II Ground Investigation Report
June 2023

Report Ref: 27485-GEO-0401 Rev A

Burley Appliances, Lands End Way, Oakham
Phase II Ground Investigation Report
June 2023

REPORT REF: 27485-GEO-0401 Rev A

CLIENT: Burley Appliances Ltd

ENGINEER: Mewies Engineering Consultants Ltd
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REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
October 2022	-	First issue	**Christopher Wall** MSc BSc (Hons) AMIEnvSc Senior Geo-Environmental Engineer	**Daniel Webb** BSc (Hons) FGS Geo-Environmental Engineer	**David Torrance** BSc (Hons) FGS CGeol Associate Director Geo-Environmental
June 2023	A	Layout Updated	**Daniel Webb** BSc (Hons) FGS Geo-Environmental Engineer	**Christopher Wall** MSc BSc (Hons) AMIEnvSc Senior Geo-Environmental Engineer	**David Torrance** BSc (Hons) FGS CGeol Associate Director Geo-Environmental

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Mewies Engineering Consultants Ltd (M-EC), has been commissioned by Marrons Planning (hereafter referred to as 'the Agent') on behalf of Burley Appliances Ltd (hereafter referred to as 'the Client') to undertake a Phase II Ground Investigation for a proposed residential development at Lands End Way, Oakham, LE15 6QF (hereafter referred to as 'the Site'). A site location plan is included within **Appendix A.**

Proposals

1.2 It is understood that the proposed development will comprise 61 residential properties with private gardens, car parking and associated access roads and infrastructure. Areas of public open space are planned in the west and an attenuation basin is proposed in the north. An illustrative masterplan is included in **Appendix A**.

Existing Relevant Site Information

1.3 This investigation has been completed according to the general principles of BS10175:2011 (+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice', and Environment Agency 'Land Contamination: Risk Management' (LC:RM). The results of the investigation have been used to refine the conceptual site model and initial recommendations outlined in a previous report detailed as follows:

> 'Phase 1 Land Contamination Risk Assessment for Class MA Conversion Application to Residential Usage on buildings at Burley Appliances Ltd, Lands End Way, Oakham, Rutland, Leicestershire, LE15 6RB', prepared by Castledine Environmental, report ref. 3210D P1 Burley Appliances – Oakham, dated 21st January 2022.

1.4 Reference has also been made to a topographical survey, provided by the Agent, and detailed as follows:

> 'Topographical Survey', prepared by Fosse Surveying, drawing ref. 1637, dated 11th November 2021.

Objectives

1.5 The objectives of this investigation were as follows:

> To undertake intrusive investigation works to identify ground conditions and establish the extent of contamination within the shallow soils;
>
> To determine the geotechnical properties of the strata to assist in civil engineering design;
>
> To confirm the ground gas regime beneath the site and provide recommendations to mitigate the associated risk where relevant; and
>
> To present a revised Conceptual Site Model (CSM) based on the results of the investigation.

1.6 This report presents the factual data obtained from the current programme of fieldwork, monitoring and laboratory testing, together with an assessment of near surface soils.

Disclaimer

1.7 M-EC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from M-EC.

1.8 M-EC does not accept responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
b) The issue of this document to any third party with whom approval for use has not been agreed.

1.9 Selected findings and opinions conveyed within this report are based on information obtained from external sources, as detailed, which M-EC believes are reliable. All reasonable care and skill have been applied in examining the information obtained, nevertheless M-EC cannot and does not guarantee the authenticity or reliability of the information it has relied upon from external sources.

1.10 Any recommendations made or opinions expressed in this report are based on the exploratory hole records, examination of samples retrieved and the results of in-situ and laboratory testing and gas monitoring undertaken during the ground investigation. Liability cannot be accepted for conditions not revealed by the exploratory holes, particularly between positions. Whilst every effort is made to ensure accuracy of data supplied, any opinion expressed as to the possible configuration of strata between or below investigation locations is for guidance only and responsibility cannot be accepted as to its accuracy.

1.11 The comments on groundwater and ground gas are based on observations made at the time of the investigation. It should be noted; however, that groundwater and ground gas levels may vary from those reported due to seasonal or other effects.

2.0 SUMMARY OF PREVIOUS INFORMATION

2.1 To follow is a summary, which should not be read in isolation, of the findings of the previous Phase 1 Land Contamination Risk Assessment. For full details, reference should be made to the report outlined in Section 1.3.

2.2 It should be noted that, at the time of the previous Phase 1 report, the proposed development comprised the conversion of the existing offices, showroom and storage unit in the west of the site to residential usage. The risk assessment presented in the previous report has therefore been revised by M-EC to reflect the current development proposal.

Site Description and Setting	The site is located within an industrial estate in the north of Oakham. A warehouse building occupies the southern area of the site with former offices, a showroom and storage buildings located in the west. Landscaped areas laid to grass occupy central and north-western areas and a gravel-surfaced parking area is located in the north-east. At the time of M-EC's investigation, the warehouse was used for the storage and distribution of household appliances. Suspected asbestos roofing and cladding was noted on the warehouse and former office building. Electricity substations were noted in the south-west of the warehouse and adjacent to the western site boundary. Mature and semi-mature trees were observed within the western landscaped areas of the site. The area in the south-east of the site was used for the storage of waste material, with stacked wooden pallets and waste metal and cardboard observed within skips. A small brick building was noted within the south-east corner of the site and was labelled as a chemical store. Access to the site is via Lands End Way to the west and Pillings Road to the north-east. The topographical survey provided indicates that levels gently fall to the east by the order of 2m. The site is bordered to the east by a railway line, with a cemetery immediately beyond, to the north by the wider industrial estate, to the west by Lands End Way, with residential properties beyond, and by allotment gardens to the south.
On-Site Historical Summary	The earliest mapping reviewed from the late 1880's indicates that the site comprised undeveloped agricultural land at this time. The site remained unchanged until the early 1980's, by which time the existing site layout had been established. Aerial imagery from 1999 indicates that a building was present in the south-west of the open area at this time, evidenced by a pathway leading to a rectangular area with little vegetation. Imagery from 2006 and 2011 indicates that refuse or debris, possibly broken fireplaces, were deposited on the car parking area in the east. This debris had been removed by 2018.

Off-Site Historical Summary	In the latter part of the 19th Century, the surrounding areas were predominantly agricultural with the existing railway line and cemetery having already been established by this time. The allotment gardens were first recorded in 1928. The wider industrial estate to the north had been established by the early 1980's, including a works and filter beds 50m north-east of the site. An additional industrial building had been constructed to the north-west by 1985 and a tank was recorded approximately 30m north of the site at this time. Further commercial units had been constructed to the north-west beyond Lands End Way by 2010.
Published Geology, Hydrogeology and Hydrology	The British Geological survey (BGS) online GeoIndex indicates that the site is directly underlain by bedrock strata of the Marlstone Rock Formation, with strata of the Dryham Formation recorded approximately 30m to the north. Superficial deposits are not mapped beneath the site or immediate surrounding area. BGS background soil chemistry indicates that the Marlstone Rock Formation may contain naturally elevated concentrations of heavy metals. The Marlstone Rock Formation is classified by the Environment Agency (EA) as a Secondary A Aquifer. The nearest surface water receptor to the site is a watercourse located 119m to the north-east. The site is located within an area within which 3-5% of properties are estimated to exceed the radon action level. Basic radon protection measures will therefore be required for the proposed development.
Environmental Appraisal	The risk to human health is considered to be low to moderate, with the following potential contaminant sources identified: Former operations and activities associated with the Burley Appliances warehouse, offices and showroom; Electricity substations in the west of the site; Asbestos containing materials within the existing buildings; Naturally elevated heavy metal concentrations within the Marlstone Rock Formation; Radon; Railway line to the east of the site; Cemetery to the east; Industrial estate to the north, including former/existing tanks; and Allotment gardens to the south.

Preliminary Conceptual Site Model

2.3 The pollutant linkages pertaining to the site and the assessed significance are summarised in the Conceptual Site Model (Table 2.1) below.

Table 2.1: Preliminary Conceptual Site Model

Source	Pathway	Receptor	Pollutant Linkage Risk
Potential contamination in shallow soils on site.	Direct contact and accidental ingestion/inhalation of contaminated soils and dust.	Construction Workers.	**Low to Moderate:** The ground investigation will confirm if contaminant concentrations within the shallow soils pose a risk to human health receptors.
		Future Site Users.	
	Vertical and lateral migration through shallow soils or via surface and groundwater.	Underlying Aquifers.	**Low to Moderate:** Shallow contamination, if present, may migrate vertically and laterally and impact the underlying aquifers. This ground investigation will confirm the risk to controlled waters and third-party property.
		Third-party property.	
	Direct contact/soil leaching.	Buried utilities and concrete.	**Low to Moderate:** pH / sulphate and hydrocarbon testing are required to confirm the risk to buried concrete and utilities.
Asbestos Containing Materials (ACMs)	Incidental inhalation of asbestos fibres	Construction/demolition workers	**Low to Moderate:** Suspected asbestos roofing and cladding has been identified. Given the age of the structures, it is likely that further asbestos may be present within the buildings and an asbestos survey should be carried out and any ACM removed prior to demolition works.
Off-site contamination sources	Lateral migration onto site via shallow soils and groundwater.	Construction Workers.	**Low to Moderate:** Potentially contaminative land uses have been identified in the surrounding area and the underlying geology may allow migration through shallow soils. This ground investigation will confirm if off-site contamination is migrating beneath the site.
		Future Site users.	
		Buried utilities and concrete structures.	
Ground gas generation	Migration through porous soils and accumulation in confined spaces.	Construction workers and future site users.	**Moderate:** Potential ground gas sources have been identified off-site. This ground investigation will determine if ground gas protection measures are required for the proposed development. It is estimated that 5-10% of properties in the area have Radon levels that exceed the action Level. On this basis, basic Radon protection measures will be required for the proposed development.

Preliminary CSM and Environmental Risk Assessment

2.3 The significance of the potential source-pathway-receptor linkages identified in the conceptual site model should be assessed using the following criteria:

Very High - There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. Investigation and remedial measures are required.

High - Harm is likely to arise to a designated receptor from an identified hazard. Investigation and remedial measures are required.

Moderate - It is possible that harm could arise to a designated receptor from an identified hazard. Investigation and remedial measures may be required.

Low - It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Remedial measures are not normally required.

3.0 GROUND INVESTIGATION

Site Works

3.1 An intrusive ground investigation was undertaken by M-EC on 5th and 8th August 2022, taking into account the findings of the Phase I Preliminary Risk Assessment. The site investigation works were carried out under full time supervision by a suitably qualified M-EC engineer.

3.2 The following scope of works was undertaken:

Service clearance of exploratory hole locations using electromagnetic and radio detection techniques;

Eight machine excavated trial pit locations (TP01-TP08) to depths of up to 2.20m below ground level (bgl);

Eight dynamic sampler boreholes (WS01-WS08) to depths of up to 2.00m bgl;

Two hand-dug trial pits (HDP01-HDP02) to depths of up to 0.40m bgl;

Installation of six groundwater and ground gas monitoring wells; and

Logging of soil arisings to BS 5930:2015 and collection of soil samples for laboratory environmental analysis.

3.3 An Exploratory Hole Location Plan is presented as Drawing No. 27485_04_140_01 in **Appendix A**. Exploratory hole logs and SPT calibration certificate are provided in **Appendix B**.

3.4 Selected exploratory holes were positioned to target specific features as outlined in Table 3.1 below.

Table 3.1: Summary of Targeted Features

Location ID	Targeted Feature
HDP01 and HDP02	Electricity substations adjacent to the warehouse and western site boundary
WS01 and WS02	Made Ground beneath existing building footprint
WS03 and WS04	Waste storage area and migration from adjacent railway line
TP08	Suspected former building in the south-west of the open area

Site Constraints

3.5 Access was not available within the former offices, showroom and storage unit in the west of the site.

3.6 The warehouse was active at the time of the investigation. The two boreholes within the building were positioned away from areas with active vehicle movement and operations.

Laboratory Analysis

3.7 A summary of the laboratory analysis undertaken on the environmental and geotechnical samples is provided in Table 3.2 below.

Table 3.2: Summary of Environmental and Geotechnical Laboratory Testing Schedules

Environmental Analysis	Geotechnical Analysis
Heavy Metals; Total, free and complex cyanide; pH and water-soluble sulphate; Total Phenols; Soil Organic Matter; Asbestos; Polycyclic Aromatic Hydrocarbons (PAH's); Total Petroleum Hydrocarbons (TPH'S); BTEX Compounds; Polychlorinated Biphenyls (PCBs); Arsenic Bioaccessibility to the Physiologically Based Extraction Test (PBET) method; BRE Suite B.	PI Clause 1.4; Moisture Content.

3.8 The geotechnical and environmental laboratory testing reports are provided in **Appendices C** and **D** respectively.

Groundwater and Ground Gas Monitoring

3.9 Groundwater and ground gas monitoring has been undertaken on four occasions between 12th August and 2nd September 2022.

3.10 Monitoring included the measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flow and barometric pressure in accordance with BS8485, to support a ground gas risk assessment. Groundwater levels were measured during each visit.

3.11 The results of the gas and groundwater monitoring are presented in **Appendix F**.

4.0 RECORDED GROUND CONDITIONS

Soil Profile

4.1 In general, ground conditions comprised Topsoil within the landscaped areas and Made Ground in southern and northern areas, directly overlying weathered bedrock strata of the Marlstone Rock Formation.

Topsoil

4.2 Topsoil was recorded to an average depth of 0.40m bgl within landscaped areas and comprised brown, silty, slightly sandy, gravelly clay topsoil with abundant fine roots and gravel of fine to coarse, angular to subrounded sandstone and limestone. Anthropogenic fragments, including brick, glass, ceramic, concrete and metal, were locally observed within the topsoil in TP01, TP02, TP08 and WS08.

Made Ground

4.3 Made Ground beneath the warehouse footprint (WS01 and WS02) comprised concrete to approximately 0.20m bgl, overlying light grey, clayey sand and soft, light greyish brown, sandy clay with gravel and cobbles of concrete, recorded to depths of up to 0.60m bgl.

4.4 Made Ground in the south-eastern and north-eastern areas (WS03, WS04 and WS07) recorded bituminous material and grey/cream, sandy, gravel of limestone, sandstone and granite at the surface. These soils were underlain by brown, clayey, gravelly sand and greenish grey, silty clay with brick, ceramic and coal fragments. Made Ground beneath these areas has been recorded to depths of up to 0.70m bgl.

4.5 TP08, advanced at the location of the suspected former building, recorded Topsoil as described previously with limestone, glass and brick, overlying brown, silty, gravelly clay with limestone, ceramic and metal to a depth of 0.40m bgl.

Marlstone Rock Formation

4.6 The Marlstone Rock Formation was predominantly recorded as firm and stiff, brown, silty, locally sandy, gravelly clay/silt, locally interbedded with thin bands of sandstone. Gravel comprised subangular to subrounded ironstone, sandstone and quartzite. The Marlstone Rock Formation predominantly graded with depth to extremely weak and weak, dark brown/yellowish brown, sandstone and ironstone, although extremely weak, thinly laminated, dark grey mudstone was recorded in four locations within the centre of the site (TP08, WS02, WS04 and WS05). The competent bedrock strata were recorded from depths of between 0.75m and 2.10m bgl and generally shallowed towards the north of the site.

Material Properties

Classification Testing

4.7 Laboratory plasticity index testing was undertaken on samples of the cohesive Marlstone Rock Formation and the results are summarised in Table 4.1 below.

Table 4.1: Summary of Plasticity Testing Results (%)

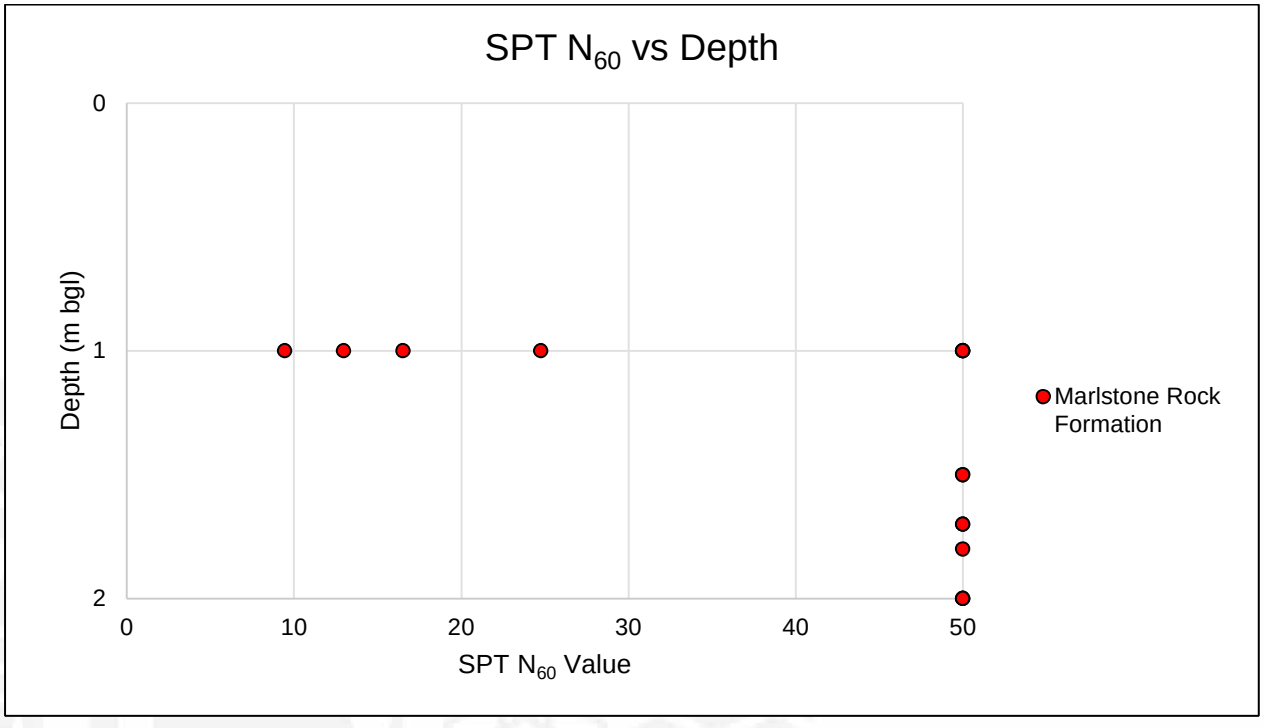
Location ID	Depth (m bgl)	Plasticity Index	% Passing 425µm Sieve	Modified Plasticity Index
WS01	0.90	37	100	37.00
WS06	0.90	36	100	36.00
WS07	0.90	42	100	42.00
TP03	1.00	49	38	18.62
TP07	0.90	36	100	36.00
TP08	1.00	23	100	23.00

4.8 The results indicate that the cohesive fractions within the Marlstone Rock Formation are predominantly medium volume change potential, with a single sample each classified as low and high-volume change potential.

Strength Profile

4.9 The strength profile of the near surface soils has been assessed by reference to the results of Standard Penetration Tests (SPT's) within the boreholes.

4.10 N values from SPT's have been corrected to derive N_{60} values, taking into account the energy loss induced by the hammer and transmitted by the drive rods and to consider overburden effects. A graph showing N_{60} values plotted against depth is presented below.



4.11 N_{60} values within the Marlstone Rock Formation were frequently recorded above 50, indicating essentially refusal within the weathered bedrock. Values within the weathered cohesive strata ranged between 9 and 25.

4.12 Empirical correlation between plasticity index and SPT N_{60} values derives apparent cohesion (Cu) values in the Marlstone Rock Formation generally of the order of 40 - 225 kN/m^2.

pH and Water-Soluble Sulphate

4.13 Twenty soil samples have been scheduled for pH and water-soluble sulphate testing and eight samples of the natural strata have been assessed for total potential sulphate concentrations. The results of the testing are summarised in Table 4.2 below.

Table 4.2: Summary of pH and Water-Soluble Sulphate Testing

	pH	Water-Soluble Sulphate (mg/l)	Total Potential Sulphate (%)
Made Ground/Topsoil			
Minimum	6.9	2.3	N/A
Maximum	8.5	89.8	N/A
BRE SD1 Value	7.05	67.0	N/A
Marlstone Rock Formation			
Minimum	6.9	1.6	0.046
Maximum	8.4	1680	28.219
BRE SD1 Value	7.0	875.9	14.47
BRE SD1 Value (excluding Mudstone)	7.3	58.2	0.20

4.14 It should be noted that the maximum values for water soluble and total potential sulphate within the Marlstone Rock Formation were from a single sample taken from the underlying mudstone strata. Two BRE SD1 Values are therefore presented in Table 4.2, one including the elevated sulphate concentrations from the mudstone and one without. Discussion on the implications of the elevated sulphate concentrations on concrete design are presented in Section 7.7.

Groundwater

4.15 Groundwater seepages were recorded in two locations during the investigation (WS04 at 2.00m bgl and WS05 at 1.50m bgl). Groundwater was not recorded during the subsequent monitoring visits.

Visual or Olfactory Contamination

4.16 Visual or olfactory evidence of contamination was not encountered during the investigation.

Obstructions

4.17 Anthropogenic obstructions were not encountered; however, the boreholes and trial pits refused on competent bedrock at depths ranging between 0.80m and 2.20m bgl. Buried construction should be anticipated beneath the existing buildings.

5.0 CONTAMINATION ASSESSMENT

M-EC Approach to Risk Assessment

5.1 The UK approach to the assessment of contaminated land is based upon the principles of risk assessment, which is founded on the use of a 'source-pathway-receptor' model in order to establish the potential presence of 'pollutant linkage'.

5.2 M-EC adopts a tiered approach to risk assessment in accordance with current UK guidance and good practice. The initial step of this process, known as Tier 1 or Generic Quantitative Risk Assessment (GQRA), is the comparison of site-derived data with relevant guideline levels. Should the adopted criteria be exceeded, then two courses of action are available. The first is to break the pollutant linkage by undertaking remedial works such as removing or treating the contaminated soil. Alternatively, a more detailed risk assessment (DQRA) can be carried out to determine whether a contamination risk exists.

Generic Quantitative Risk Assessment

5.3 The assessment involves the screening of the reported concentrations of contaminants within the soils sampled during the ground investigation against published generic assessment criteria (GAC) values, which are representative of a minimal or tolerable human health risk. M-EC have adopted assessment criteria (Suitable for Use Levels-S4UL's) produced by the Chartered Institute of Environmental Health (CIEH), in association with LQM, published November 2015. Where no S4UL is available, reference is made to other relevant standards as appropriate.

5.4 In undertaking this GQRA, the Soil Organic Matter (SOM) content of 2.5% has been used based on the average SOM recorded. For the purposes of this investigation under the CL:AIRE environmental guidelines, the 'Residential with consumption of homegrown produce' generic assessment criteria (GAC) have been used. A summary of the laboratory testing results is presented in **Appendix E**.

Metals, Metalloids and Non-metals

5.5 Twelve soil samples were analysed for concentrations of metals, non-metals and metalloids. The results of the analysis indicate that concentrations of Arsenic exceeded the GAC in 10 of the 12 samples tested. Concentrations of Total, Free and Complex Cyanide, Total Phenols, Cadmium, Chromium VI, Mercury and Selenium were reported below the laboratory method detection limit.

Polycyclic Aromatic Hydrocarbons

5.6 Twelve soil samples were assessed for concentrations of the US EPA 16 priority PAH compounds. Six samples returned PAH concentrations below the laboratory method detection limit and the results of the remaining samples were reported below the adopted GAC.

Petroleum Hydrocarbons

5.7 Four soil samples were analysed for concentrations of speciated petroleum hydrocarbons, benzene, toluene, ethylbenzene and xylene (BTEX) and methyl tertiary butyl ether (MTBE). Concentrations of petroleum

hydrocarbons were predominantly recorded below the laboratory method detection limit, with the exception of the Aromatic >EC21-EC35 band within the sample tested from WS01 (0.30m), which returned a concentration of 14mg/kg.

5.8 The results of the analysis indicate that concentrations of petroleum hydrocarbons do not exceed the adopted GAC.

Asbestos

5.9 Eight soil samples were analysed for asbestos fibres by optical microscopy. Asbestos was not detected in any of the samples.

Polychlorinated Biphenyls

5.10 Two samples taken adjacent to the electricity substation were analysed for concentrations of seven PCB congeners and total PCBs. Both samples returned PCB concentrations below the laboratory method detection limit.

Buried Utilities

5.11 The results of the laboratory analysis indicate that standard utility pipes will be appropriate for the proposed development. The results should be passed on to the utility providers for confirmation.

Detailed Quantitative Risk Assessment – Arsenic

5.12 The results of the initial GQRA have confirmed that concentrations of Arsenic in the soils exceed M-EC's GAC protective of human health receptors. M-EC have subsequently undertaken a Detailed Quantitative Risk Assessment (DQRA) in order to derive Site Specific Assessment Criteria (SSAC) for Arsenic.

5.13 In order to derive the SSAC, M-EC have undertaken additional testing to the Physiologically Based Extraction Test (PBET) method on four samples containing elevated Arsenic concentrations. The results of the testing are summarised in Table 5.1 below.

Table 5.1 Bioaccessible Arsenic in Soils (%)

Sample ID	Depth (m bgl)	Arsenic Concentration (mg/kg)	Stomach Fraction	Intestine (1) Fraction	Intestine (2) Fraction
WS01	0.30	58	0.2	0.9	0.9
WS04	0.65	43	0.3	0.7	0.8
TP02	0.10	56	0.3	0.4	0.2
TP06	0.10	61	0.3	0.9	0.8

5.14 SSAC were derived using the CLEA Model (V1.071 © Environment Agency 2015). The relative oral bioavailability (RBA) of Arsenic was adjusted from the default value of 100% for soil, and replaced with the most conservative site-specific value of 0.9%. The RBA for airborne dust was unchanged. The amendments to the CLEA model produce a SSAC of 121 mg/kg.

5.15 Reported Arsenic concentrations in the samples tested did not exceed this revised SSAC. Accordingly, the risk to human health is considered to be low.

Soil Contamination Summary

5.16 Following completion of the GQRA and subsequent DQRA with respect to Arsenic contamination, it is considered that the risk to human health receptors from contamination within shallow soils and topsoil is low and specific remedial measures will not be required.

Controlled Waters Risk Assessment

5.17 Given that significant contaminant concentrations have not been recorded in the Made Ground and that shallow groundwater has not been encountered, it is considered that the risk to controlled waters is low and further assessment is not required in this respect.

6.0 GROUND GAS RISK ASSESSMENT

Gas Monitoring Results

6.1 The results of the ground gas monitoring are summarised in Table 6.1 below.

Table 6.1: Summary of Maximum Steady State Ground Gas Monitoring Concentrations (%)

Location	Methane Concentrations (% v/v)	Carbon Dioxide Concentrations (% v/v)	Flow Rates (l/hr)	Maximum Gas Screening Value (GSV l/hr)
WS01	<0.1	3.2	<0.1	0.0072
WS02	<0.1	2.6	<0.1	
WS03	<0.1	6.7	<0.1	
WS05	<0.1	0.9	<0.1	
WS07	<0.1	7.2	<0.1	
WS08	<0.1	2.1	<0.1	

6.2 During the monitoring visits, atmospheric pressure was recorded above 1000mb on three occasions and under falling and static conditions. The monitoring visit on 16th August recorded pressure below 1000mb and under static pressure conditions; however, the visit was undertaken shortly after a low-pressure event on 15th August. On this basis, it is considered likely that the worst-case gassing scenario will have been captured.

6.3 Hydrogen sulphide and carbon monoxide concentrations were generally not recorded above the limit of detection of the monitoring equipment used; although concentrations ranging between 10 and 35ppm were recorded on the first and second monitoring visits. Volatile vapour concentrations were recorded between 1.6 and 40ppm.

Risk Assessment

6.4 In accordance with BS8485:2015 + A1:2019, the GSV calculated indicates that the site would be classified as falling with Characteristic Situation 1 (CS1); however, carbon dioxide concentrations within two locations (WS03 and WS07) have been recorded above 5% v/v, which warrants consideration to an increase to CS2.

6.5 It should be noted that the site lies in an area where it is estimated that 5-10% of properties exceed the Radon Action Level and that basic Radon protection measures will be a requirement for the whole site. Such measures will include the adoption of a ventilated void and Radon membrane, which will provide a degree of protection against carbon dioxide. Given that the GSV classifies the site as CS1 and that flow rates have not been recorded above the limit of detection of the monitoring equipment, it is considered that an increase to CS2 would be overly conservative and that the incorporation of Radon protection measures will afford suitable protection against carbon dioxide.

7.0 GEOTECHNICAL ASSESSMENT

Introduction

7.1 The finalised development layout, foundation loadings and site levels were not available at the time of reporting. Preliminary recommendations are presented based on the development layout and standard loading criteria for traditional housing.

Foundation Design

7.2 Based on the soil profile encountered, it is considered that traditional strip/trench fill foundations will be suitable for the proposed development. Given the high-volume change potential, it is recommended that a minimum foundation depth of 1.00m bgl is adopted in accordance with NHBC Standards Chapter 4.2. On this basis, an allowable net bearing pressure of at least 110kN/m^2 should be achievable, assuming a 600mm wide strip, limiting total settlements to 25mm and maintaining differential settlements within acceptable limits.

Floor Slab Design

7.3 Given that radon protection measures are required for the proposed development and taking into account the presence of Made Ground in southern areas, it is considered that suspended floor slabs will be required for the proposed development..

Building Near Trees

7.4 Mature and semi-mature trees are present within western areas of the site and planting is proposed as part of the development layout in **Appendix A**. Appropriate adjustments to foundation and floor slab design will be required for the proposed development in accordance with NHBC Standards – Chapter 4.2. A detailed assessment should be completed based on a tree survey to identify heights and species. It may be appropriate to deepen foundations within the significant zone of influence of trees to terminate within the competent sandstone bedrock.

Concrete Classification

7.5 The results of the pH and sulphate testing indicate that the mudstone bedrock is pyritic and will therefore need to be considered with respect to concrete design. Where foundations are terminated within the mudstone bedrock, concrete would need to be designed to resist the pyritic strata and a Design Sulphate (DS) Class of DS-5 and an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-4s would be required. Where the mudstone bedrock is absent, a DS class of DS-1 and an ACEC class of AC-1s could be adopted.

7.6 The mudstone bedrock has primarily been encountered within the centre of the site and it is recommended that over deepening of foundations should be avoided in this area, where possible, to ensure that foundations terminate within the overlying weathered clays/sandstone enabling adoption of the reduced concrete specification.

Excavations

7.7 Excavation of the Made Ground and underlying natural soils should generally be readily achievable using conventional hydraulic excavation techniques. A higher specification of plant will be required to penetrate the competent bedrock strata, where encountered.

7.8 Excavation sides have generally been recorded as stable; however, appropriate shoring or battering will be required if excavations are left exposed for long periods of time.

7.9 Groundwater seepages encountered within excavations are likely to be adequately dealt with via traditional methods of dewatering such as sumping and pumping.

7.10 It is recommended that excavations should not be entered without appropriate support and a full risk assessment should be completed prior to entry. Appropriate precautions should be taken to mitigate the potential risk associated with the accumulation of ground gases.

Pavement Design

7.11 Where Made Ground is encountered beneath proposed pavement areas, it should be removed to a depth of at least 500mm below formation level, sorted, supplemented and recompacted to achieve a CBR Design value within the range 2 5%.

7.12 The weathered cohesive strata of the Marlstone Rock Formation are generally firm at shallow depth across the site. Where encountered, a Design CBR value of the order of 2-3% should be available for design purposes.

7.13 In situ CBR testing may be required to confirm design values for adoptable roads.

Soakaways

7.14 Given the presence of sandstone bedrock, soakaway drainage may be feasible for the site; however, this would be subject to soil infiltration rate testing in accordance with BRE:365.

8.0 UPDATED CONCEPTUAL SITE MODEL

Introduction

8.1 Based on the findings of the ground investigation, the conceptual site model developed within Section 2.0 has been revised and is presented in Table 8.1 below to reflect the increased level of data available.

Table 8.1: Updated Conceptual Site Model

Source	Pathway	Receptor	Pollutant Linkage Risk
Potential contamination in shallow soils on site.	Direct contact and accidental ingestion/inhalation of contaminated soils and dust.	Construction Workers.	**Low**: Health and safety measures should be adopted on-site to protect site workers from contaminants.
		Future Site Users.	**Low:** The results of the GQRA and DQRA indicate that contaminant concentrations do not exceed the adopted GAC and remedial measures are not required.
	Consumption of home grown produce		
	Vertical and lateral migration through shallow soils or via surface and groundwater.	Underlying Aquifers	**Low:** Significant contaminant concentrations and shallow groundwater have not been encountered. Remedial measures are not required to protect controlled waters or third-party property.
		Third party property.	
	Direct contact	Buried concrete	**Low, locally Moderate**: Buried concrete in contact with the mudstone bedrock would need to be designed to DS-5, AC-4s. Where the mudstone bedrock is absent, concrete can be designed to DS-1, AC-1s.
	Soil leaching.	Buried utilities and concrete.	**Low:** Standard PE pipes will be appropriate for the proposed development.
Asbestos Containing Materials (ACMs)	Incidental inhalation of asbestos fibres	Construction/demolition workers	**Low to Moderate**: Suspected asbestos roofing and cladding has been identified. Given the age of the structures, it is likely that asbestos may be present within the buildings and an asbestos survey should be carried out and any ACM removed prior to demolition works.
Off-site contamination sources.	Lateral migration onto site via shallow soils and groundwater.	Construction Workers.	**Low:** The result of the GQRA and DQRA does not indicate evidence of contaminant migration from off-site sources.
		Future Site users.	
Ground gas generation on and off site.	Migration through porous soils and accumulation in confined spaces.	Construction workers.	**Low to Moderate:** The site is located within an area where 3-5% of properties exceed the Radon Action Level and basic Radon protection measures will be required for the proposed development.

Source	Pathway	Receptor	Pollutant Linkage Risk
		Future site users.	These measures will afford suitable protection against the marginally elevated carbon dioxide concentrations recorded during the monitoring programme.

9.0 REMEDIATION STATEMENT

9.1 The results of the GQRA and DQRA indicate that elevated contaminant concentrations that could pose a potential risk to human health receptors have not been recorded. Remedial measures are therefore not required with respect to soil contamination.

9.2 In the event that previously unidentified contamination is encountered, a competent geo-environmental engineer should be consulted and the Contaminated Land/Environmental Health Officer at the Local Authority should be informed of mitigation proposals for the area of concern. The remedial approach will require their approval. Further investigation may be required to confirm the extent of any such contamination.

Utilities

9.3 The results of the laboratory analysis indicate that standard utility pipes will be appropriate for the proposed development. The results should be passed on to the utility providers for confirmation.

Waste Disposal

9.4 Any materials which the developer intends to discard as part of the construction of the development would be classed as wastes and must be appropriately handled in accordance with current Waste Legislation. The developer should be aware of and utilise the waste hierarchy where possible. Where materials cannot be retained on site and disposal is the only option the waste should be classified and sent to an appropriate waste receiving facility.

Controlled Waters

9.5 Significant contaminant concentrations and shallow groundwater have not been recorded, therefore, remedial measures to protect controlled waters receptors are not required.

Gas Protection Measures

9.6 As the site is located in an area where 5-10% of properties are above the action level for Radon, basic protection measures will be required for the proposed development. These measures will afford suitable protection against the marginal carbon dioxide concentrations recorded.

9.7 Given the relatively low vapour concentrations identified during the ground gas monitoring works, it is not considered that any specific protection measures are required for the proposed development in respect to volatile vapours.

10.0 CONCLUSIONS

10.1 Based on the findings of the ground investigation, the following further works are suggested:

Classification of waste soils in accordance with EA Technical Guidance Note WM3, and WAC testing if landfill disposal is the preferred option;

Soil infiltration rate testing in accordance with BRE:365, if required;

Detailed assessment of foundation and floor slab design based on a tree survey.

10.2 This report should be submitted to the local authority for comment and approval.

MEC

Development Technical Consultants

APPENDICES

APPENDIX A

M-EC
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

SITE LOCATION PLAN

Project:	**Burley Appliances, Lands End Way, Oakham**
File Ref:	**27485**
O.S. Grid Ref:	**485674, 309589**
Postcode:	**LE15 6QF**

0 5m 10m 15m 20m 25m 30m

status PRELIMINARY

notes

project title Burley Appliances Ltd
Lands End Way, Oakham

client Burley Appliances Ltd

drawing title Illustrative Masterplan

drawing no.	1600529.2.06
scale	1:500@A1
date	May 2023
drawn by	AC
checked by	/
revision	/

Marrons
No.1 Colmore Square, Birmingham, B4 6AA
t: 0121 214 0000 | w: www.marrons-planning.co.uk
e: info@marrons-planning.co.uk

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

KEY

TP01 — TRIAL PIT LOCATION

WS04 — WINDOW SAMPLE LOCATION (*GROUND GAS MONITORING INSTALLATION)

HA01 — HAND-DUG TRIAL PIT LOCATION

APPROXIMATE SITE BOUNDARY

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	CW	DW	DT	11.10.22

PROJECT:
BURLEY APPLIANCES
LANDS END WAY
OAKHAM

DRAWING TITLE:
EXPLORATORY HOLE LOCATION PLAN

CLIENT:
BURLEY APPLIANCES

DRAWING NUMBER:
27485_04_140_01

REVISION: – SHEET SIZE: A1 SCALE: 1:500

STATUS:
FOR INFORMATION / APPROVAL

M-EC
Consulting Development Engineers

Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

File Location: T:\M-EC Job Book\27485\drawings\04 series - environmental\27485_04_140_01 exploratory hole location plan.dwg

Printed:18.10.2022

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Development Technical Consultants

APPENDICES

APPENDIX B

Strata Description	Depth (m)	Level (m AOD)	Legend
MADE GROUND: Fine grained concrete.	0.02	112.48	
MADE GROUND: Fine to coarse grained concrete.	0.18	112.32	
5mm metal rebar.	0.25	112.25	
MADE GROUND: Light grey clayey fine to coarse sand with gravel and cobbles of concrete.	0.30	112.20	
MADE GROUND: Soft light greyish brown sandy clay with gravel and cobbles of concrete.	0.40	112.10	
MADE GROUND: Firm brown silty slightly sandy clay with rare fine brick and carbonaceous fragments.			
Firm brown CLAY/SILT with rare gravel sized fragments of fine to coarse subrounded to subangular ironstone and sandstone. MARLSTONE ROCK FORMATION			
Dense orangish brown very clayey SAND with gravel sized fine to coarse subangular ironstone and sandstone lithorelicts. MARSLTONE ROCK FORMATION	1.20	111.30	
Very dense orangish brown clayey fine to coarse SAND with gravel sized fine to coarse angular to subangular ironstone lithorelicts and belemnite fossils. MARSLTONE ROCK FORMATION	1.50	111.00	
Borehole terminated at 1.70m	1.70	110.80	

Strata Description	Depth (m)	Level (m AOD)	Legend
MADE GROUND: Fine to coarse grained concrete.			
5mm metal rebar.	0.20	112.30	
MADE GROUND: Dark brown clayey sandy gravel of fine to coarse subangular to subrounded ironstone, limestone and concrete.	0.30	112.20	
MADE GROUND: Light grey clayey fine to coarse sand with gravel and cobble sized fragments of angular to subangular concrete.	0.60	111.90	
Firm brown silty CLAY with rare gravel sized fine subangular to subrounded ironstone and sandstone lithorelicts.			
MARLSTONE ROCK FORMATION	1.00	111.50	
Extremely weak highly weathered fine grained light brown SANDSTONE.	1.10	111.40	
MARLSTONE ROCK FORMATION			
Stiff dark brown/light grey silty CLAY.			
MARLSTONE ROCK FORMATION	1.40	111.10	
Stiff greyish brown silty slightly sandy thinly laminated CLAY with rare roots.			
MARLSTONE ROCK FORMATION	1.70	110.80	
Extremely weak highly weathered dark grey thinly laminated MUDSTONE with cobbles of limestone.			
MARLSTONE ROCK FORMATION	2.00	110.50	
Borehole terminated at 2.00m			

Strata Description	Depth (m)	Level (m AOD)	Legend
MADE GROUND: Bituminous material.			
MADE GROUND: Grey sandy gravel sized fragments of subangular limestone and granite.	0.15	111.96	
MADE GROUND: Cream clayey sandy gravel sized fragments of subangular limestone.	0.45	111.66	
MADE GROUND: Firm brown silty clay with rare gravel sized fragments of brick and coal.	0.50	111.61	
Firm greyish/orangish brown silty CLAY. MARLSTONE ROCK FORMATION	0.70	111.41	
Stiff greyish brown silty slightly sandy thinly laminated CLAY. MARLSTONE ROCK FORMATION	1.50	110.61	
Extremely weak highly weathered IRONSTONE. MARLSTONE ROCK FORMATION	1.70	110.41	
Borehole terminated at 1.80m	1.80	110.31	

Strata Description	Depth (m)	Level (m AOD)	Legend
MADE GROUND: Grey/reddish brown sandy fine to coarse gravel sized fragments of angular to subangular limestone.			
MADE GROUND: Cream sandy fine to coarse gravel sized fragments of angular to subangular sandstone.	0.20	112.10	
MADE GROUND: Brown clayey sand with occasional gravel sized fragments of fine to medium angular to subrounded flint and quartzite and pockets of sandy clay/	0.30	112.00	
Brick at 0.40m bgl.	0.60	111.70	
Firm light brown silty CLAY with rare gravel sized fragments of fine subangular flint and quartzite. MARLSTONE ROCK FORMATION	0.95	111.35	
Pockets of sandstone from 0.80m bgl.	1.00	111.30	
Extremely weak highly weathered light grey fine grained SANDSTONE. MARLSTONE ROCK FORMATION			
Firm greyish/yellowish light brown silty CLAY. MARLSTONE ROCK FORMATION	1.50	110.80	
Extremely weak highly weathered dark greyish yellow thinly laminated subangular MUDSTONE. MARLSTONE ROCK FORMATION			
Borehole terminated at 2.00m	2.00	110.30	

Strata Description	Depth (m)	Level (m AOD)	Legend
Grass over brown silty slightly gravelly clay TOPSOIL with abundant fine roots. Gravel is fine subangular to subrounded flint and quartzite.			
Firm light brown silty slightly gravelly CLAY with occasional fine roots. Gravel is fine to medium subangular to subrounded flint and quartzite. MARLSTONE ROCK FORMATION	0.35	112.15	
Firm greyish brown silty slightly sandy thinly laminated CLAY with rare fine roots. MARLSTONE ROCK FORMATION	0.90	111.60	
Firm orangish grey silty very sandy CLAY. MARLSTONE ROCK FORMATION	1.40	111.10	
Extremely weak highly weathered dark grey silty MUDSTONE. MARLSTONE ROCK FORMATION	1.60	110.90	
Borehole terminated at 2.00m	2.00	110.50	

Strata Description	Depth (m)	Level (m AOD)	Legend
Grass over brown silty clay TOPSOIL with rare fine brick and fine to medium gravel of angular to subangular sandstone and quartzite.			
Extremely weak highly weathered fine grained SANDSTONE. MARLSTONE ROCK FORMATION	0.45	111.60	
Stiff, becoming very stiff orangish/greyish brown thinly laminated CLAY/SILT with occasional fine roots. MARLSTONE ROCK FORMATION	0.50	111.55	
Extremely weak highly weathered fine grained orangish/brown SANDSTONE. MARLSTONE ROCK FORMATION	1.30	110.75	
Borehole terminated at 1.50m	1.50	110.55	

Strata Description	Depth (m)	Level (m AOD)	Legend
MADE GROUND: Greyish black gravel sized fragments of fine to coarse subangular limestone.	0.10	111.65	
MADE GROUND: Pinkish grey fine to coarse sand. with gravel sized fragments of fine to coarse subangular limestone.	0.30	111.45	
MADE GROUND: Firm greenish grey silty clay with rare fine ceramic and rare fine roots.	0.50	111.25	
Firm greyish brown silty CLAY with rare fine roots. MARLSTONE ROCK FORMATION	0.70	111.05	
Stiff orangish/greyish brown CLAY/SILT with rare fine roots. MARLSTONE ROCK FORMATION	0.95	110.80	
Very dense orangish brown clayey fine to coarse SAND. MARLSTONE ROCK FORMATION	1.40	110.35	
Extremely weak highly weathered fine grained brown SANDSTONE. MARLSTONE ROCK FORMATION	1.50	110.25	
Borehole terminated at 1.50m			

Strata Description	Depth (m)	Level (m AOD)	Legend
Grass over brown silty slightly sandy clay TOPSOIL with abundant fine roots and rare fine sandstone and concrete fragments. (Reworked)			
Firm orangish/light greyish brown silty slightly sandy CLAY with a band of dark brown sandstone. MARLSTONE ROCK FORMATION	0.30	112.90	
Band of dark brown sandstone.			
Firm dark brown very sandy CLAY. MARLSTONE ROCK FORMATION	1.00	112.20	
Dark brown clayey fine to coarse SAND. MARLSTONE ROCK FORMATION	1.20	112.00	
Strong weathered dark brown fine grained SANDSTONE. MARLSTONE ROCK FORMATION	1.60	111.60	
Borehole terminated at 1.70m	1.70	111.50	

Strata Description	Legend
MADE GROUND: Grass over brown silty slightly sandy gravelly clay topsoil with abundant fine roots, ceramic and glass fragments. Gravel is fine to coarse subangular flint and limestone.	
Firm, brown silty CLAY with occasional fine roots and rare gravel sized fragments of subangular limestone. MARLSTONE ROCK FORMATION	
Firm, greyish/orangish brown silty sandy CLAY with occasional fine roots. MARLSTONE ROCK FORMATION	
Stiff greyish/orangish light grey silty thinly laminated CLAY with a single boulder of subangular limestone. MARLSTONE ROCK FORMATION	
Dark brown silty fine to medium SAND with gravel sized fine to medium subangular ironstone lithorelicts. MARLSTONE ROCK FORMATION	
Extremely weak highly weathered blue fine grained SANDSTONE and dark brown IRONSTONE. MARLSTONE ROCK FORMATION	
End of Trial Pit	

Strata Description	Legend
MADE GROUND: Grass over brown silty clay topsoil with abundant fine roots and rare gravel sized fragments of brick, plastic, metal, ceramic, flint and limestone.	
Firm, brown silty, slightly gravelly CLAY with occasional fine roots. Gravel is subrounded, fine to medium quartzite. MARLSTONE ROCK FORMATION	
Firm orangish/greyish brown silty sandy CLAY. MARLSTONE ROCK FORMATION	
Stiff brown silty very sandy CLAY with gravel sized lithorelicts of fine to medium subangular limestone. MARLSTONE ROCK FORMATION	
Extremely weak highly weathered dark brown IRONSTONE. MARLSTONE ROCK FORMATION	
End of Trial Pit	

Strata Description	Legend
Grass over brown silty gravelly clay TOPSOIL with roots. Gravel is fine angular to rounded flint and brick fragments. (Reworked)	
Firm brown CLAY/SILT with roots. MARLSTONE ROCK FORMATION	
Firm orangish/greyish brown silty slightly sandy CLAY with abundant gravel sized lithorelicts of fine to coarse subangular to subrounded ironstone. MARLSTONE ROCK FORMATION	
Strong dark grey fine grained SANDSTONE. MARLSTONE ROCK FORMATION End of Trial Pit	

Strata Description	Legend
Grass over yellowish brown silty gravelly clay TOPSOIL with roots. Gravel is fine to coarse angular to subrounded sandstone with rare limestone.	
Firm yellowish brown silty sandy CLAY with roots and abundant gravel sized fragments of fine to coarse angular to subrounded sandstone and quartzite. MARLSTONE ROCK FORMATION	
Weak yellowish/orangish brown fine to medium grained SANDSTONE. MARLSTONE ROCK FORMATION End of Trial Pit	

Strata Description	Legend
Grass over brown silty slightly gravelly clay TOPSOIL with roots. Gravel is fine to medium angular to rounded quartzite and brick fragments.	
Firm greyish brown silty CLAY with roots and gravel sized fragments of fine to medium quartzite. MARLSTONE ROCK FORMATION	
Firm yellowish/greyish brown silty slightly sandy locally sandy CLAY. MARLSTONE ROCK FORMATION	
Weak brown/black fine grained SANDSTONE and IRONSTONE. MARLSTONE ROCK FORMATION	
End of Trial Pit	

Strata Description	Legend
Grass over brown silty slightly gravelly clay TOPSOIL with abundant fine roots and rare brick. Gravel is fine to coarse angular to subrounded limestone and sandstone. (Reworked)	
Firm greyish/orangish brown silty CLAY with occasional fine roots. MARLSTONE ROCK FORMATION	
Firm light grey silty slightly sandy CLAY. MARLSTONE ROCK FORMATION	
Brown clayey fine to coarse SAND with gravel sized lithorelicts of fine to coarse subangular to subrounded limestone. MARLSTONE ROCK FORMATION	
Weak brown/ dark brown fine grained SANDSTONE. MARLSTONE ROCK FORMATION End of Trial Pit	

Strata Description	Legend
Brown silty clay TOPSOIL with roots and rare gravel of fine to medium subrounded to subangular charcoal and brick fragments. (Reworked)	
Firm orangish brown silty slightly sandy CLAY with roots. MARLSTONE ROCK FORMATION	
Firm dark brown/ greyish brown sandy CLAY/SILT with occasional gravel sized lithorelicts of fine to coarse subangular to subrounded ironstone. MARLSTONE ROCK FORMATION	
Weak brown/dark brown fine grained IRONSTONE and SANDSTONE. MARLSTONE ROCK FORMATION End of Trial Pit	

Strata Description	Legend
MADE GROUND: Grey clay topsoil with roots and abundant gravel sized fragments of fine to medium subangular to subrounded limestone, glass and brick.	
MADE GROUND: Brown silty clay with roots and occasional gravel sized fragments of fine to medium subangular to rounded limestone, ceramic and metal. MARLSTONE ROCK FORMATION	
Firm brown silty CLAY with roots and gravel sized lithorelicts of fine to medium subangular sandstone. MARLSTONE ROCK FORMATION	
Extremely weak fine grained greyish brown SANDSTONE. MARLSTONE ROCK FORMATION	
Stiff orangish/light greyish brown thinly laminated CLAY/SILT. MARLSTONE ROCK FORMATION	
Weak greyish brown fine grained SANDSTONE. MARLSTONE ROCK FORMATION	
Extremely weak multicoloured thinly laminated MUDSTONE. MARLSTONE ROCK FORMATION	
Extremely weak dark grey MUDSTONE. MARLSTONE ROCK FORMATION	
End of Trial Pit	

Strata Description	Legend
Brown, silty, sandy clay TOPSOIL with abundant fine roots and rare brick fragments. (Reworked)	
End of Trial Pit	

Strata Description	Legend
Brown, silty, sandy clay TOPSOIL with abundant fine roots and rare brick fragments. (Reworked)	
End of Trial Pit	

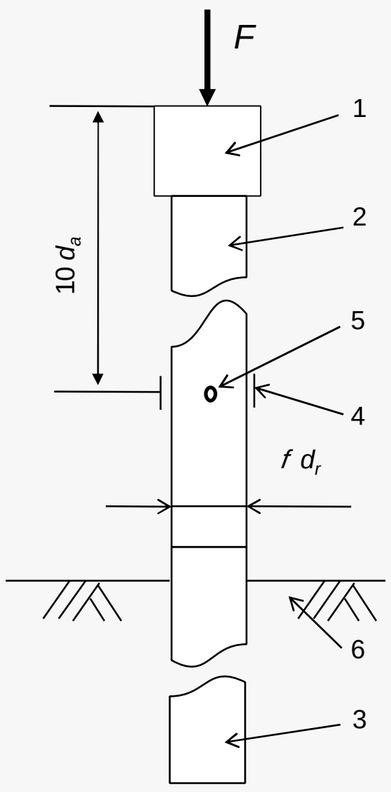
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer		PREMIER
Test No		EQU2022_203
Client		M-EC
Test Depth (m)		9.80
Mass of hamme	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm^2
Modulus	E_a =	206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

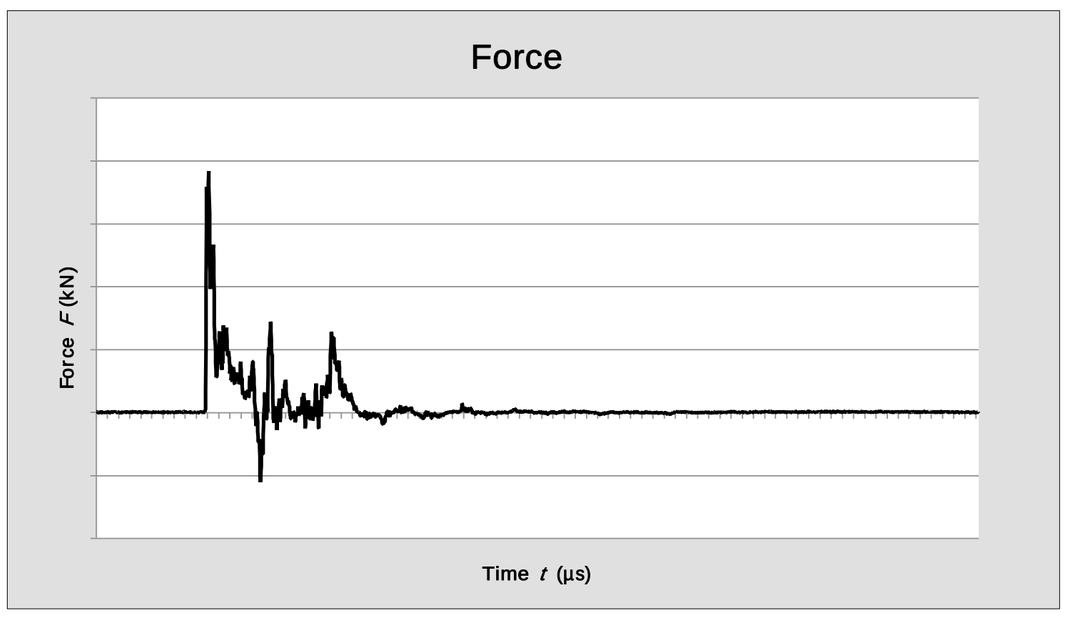
DATE OF TEST	VALID UNTIL	HAMMER ID
12/07/2022	12/07/2023	110 111

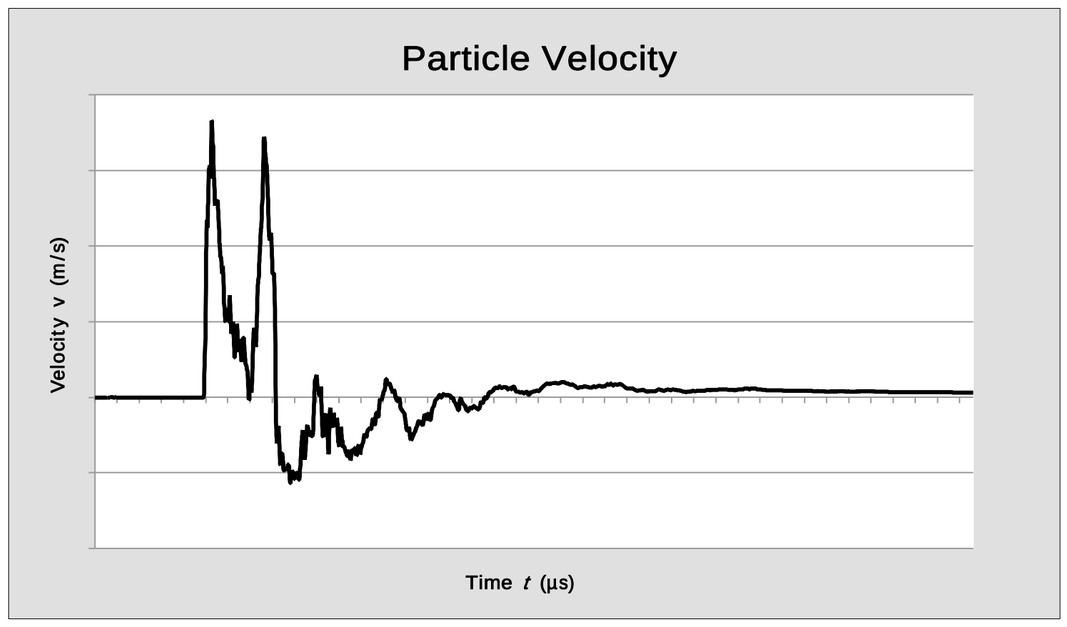
E_{meas} = 0.446 kN-m

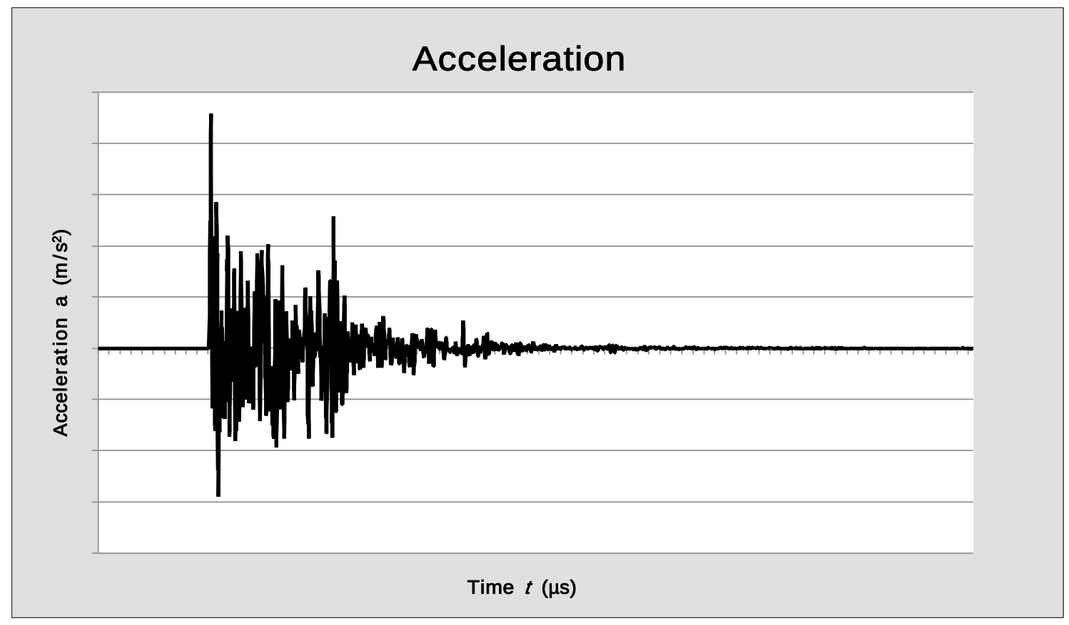
E_{theor} = 0.473 kN-m

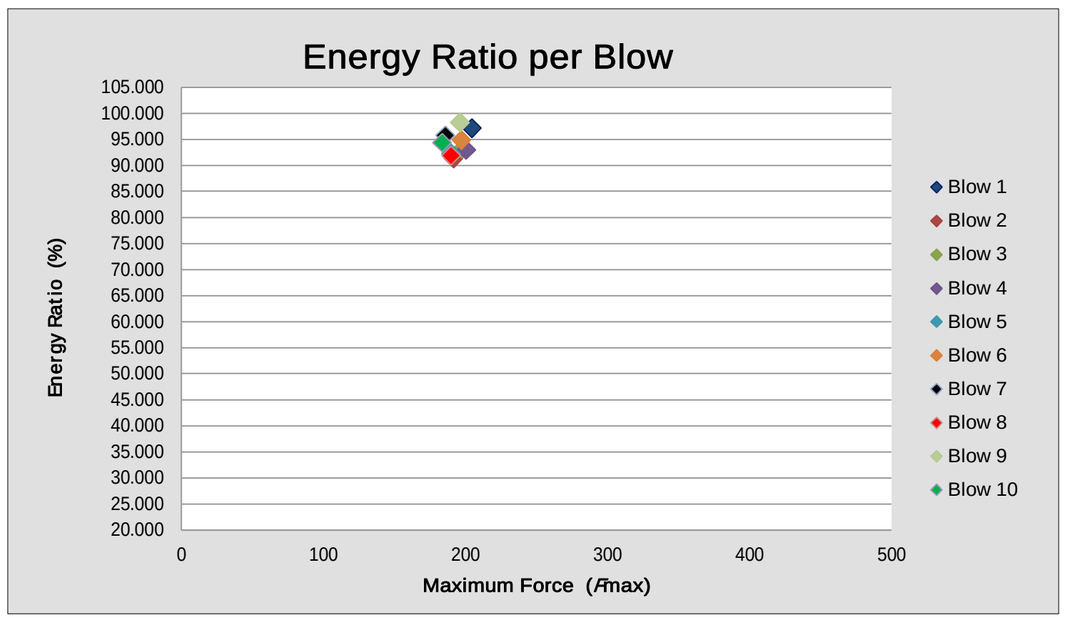
Comments

Energy Ratio (Er) = $\frac{E_{meas}}{E_{th\,eor}}$ **94.31%**









Equipe SPT Analyzer Operator	Certificate prepared b	Certificate checked b	Certificate date
KS	21/07/2022	21/07/2022	21/07/2022

 Equipe Group, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

MEC
Development Technical Consultants

APPENDICES

APPENDIX C

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

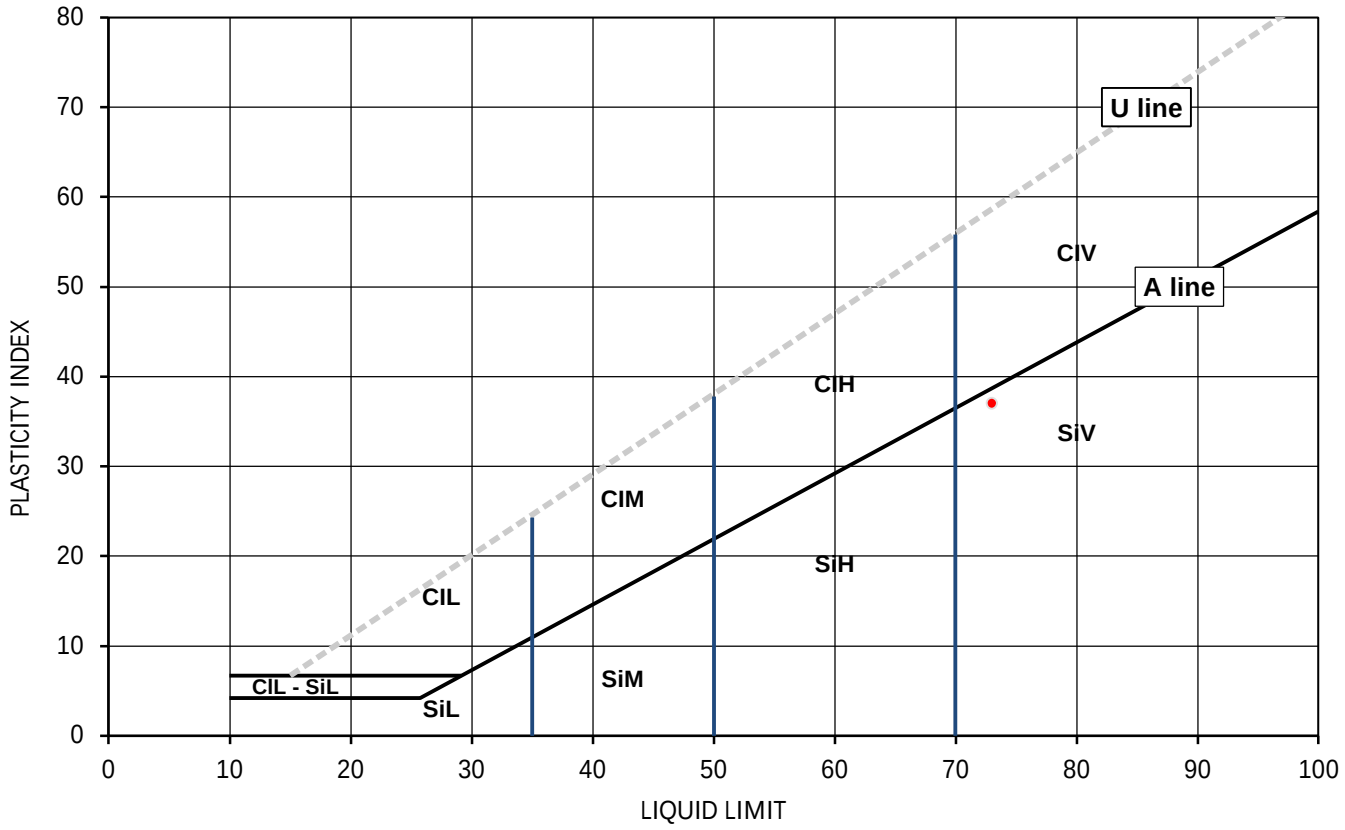
Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	05/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382826	Depth Top [m]:	0.90
Hole No.:	WS01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown slightly silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
36	73	36	37	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

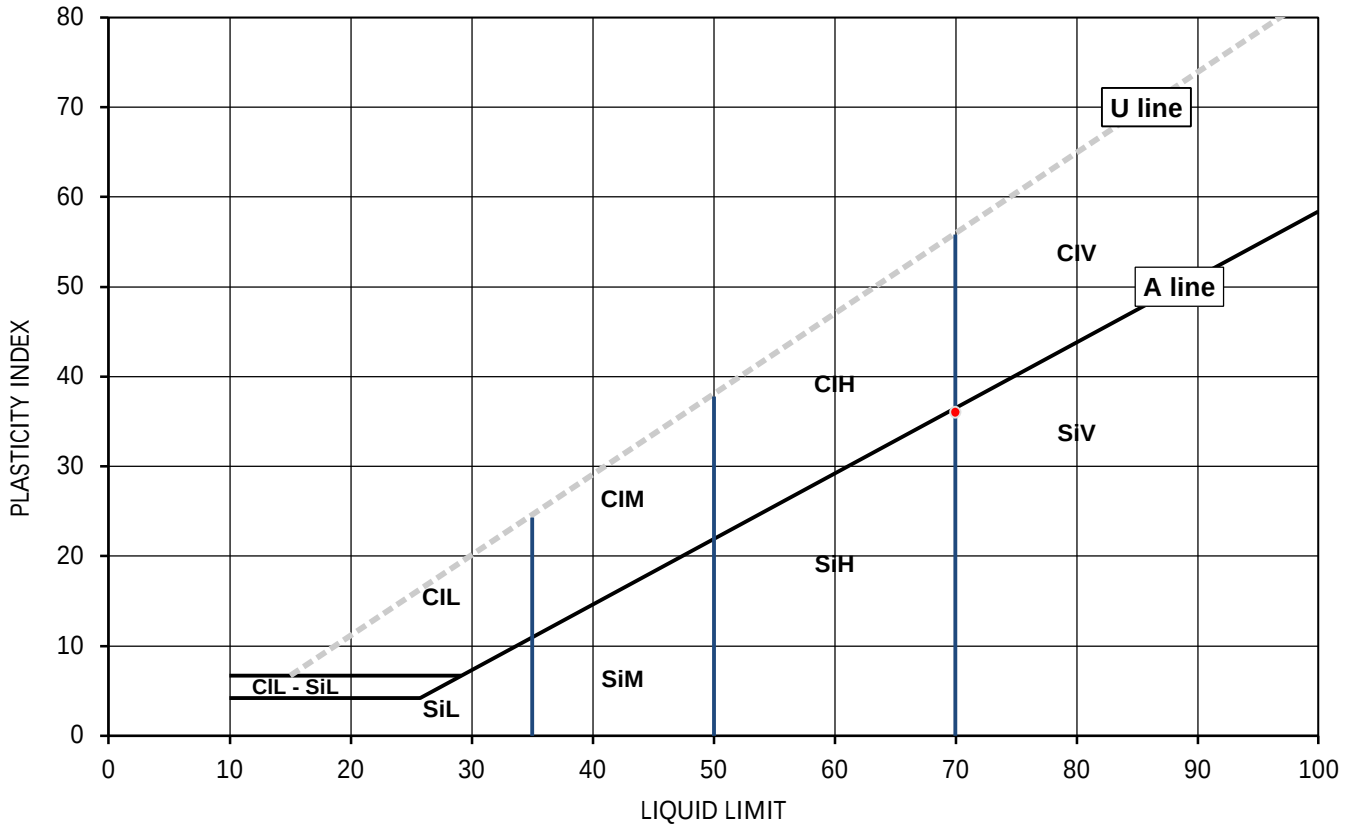
Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	05/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382827	Depth Top [m]:	0.90
Hole No.:	WS06	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown very sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
31	70	34	36	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

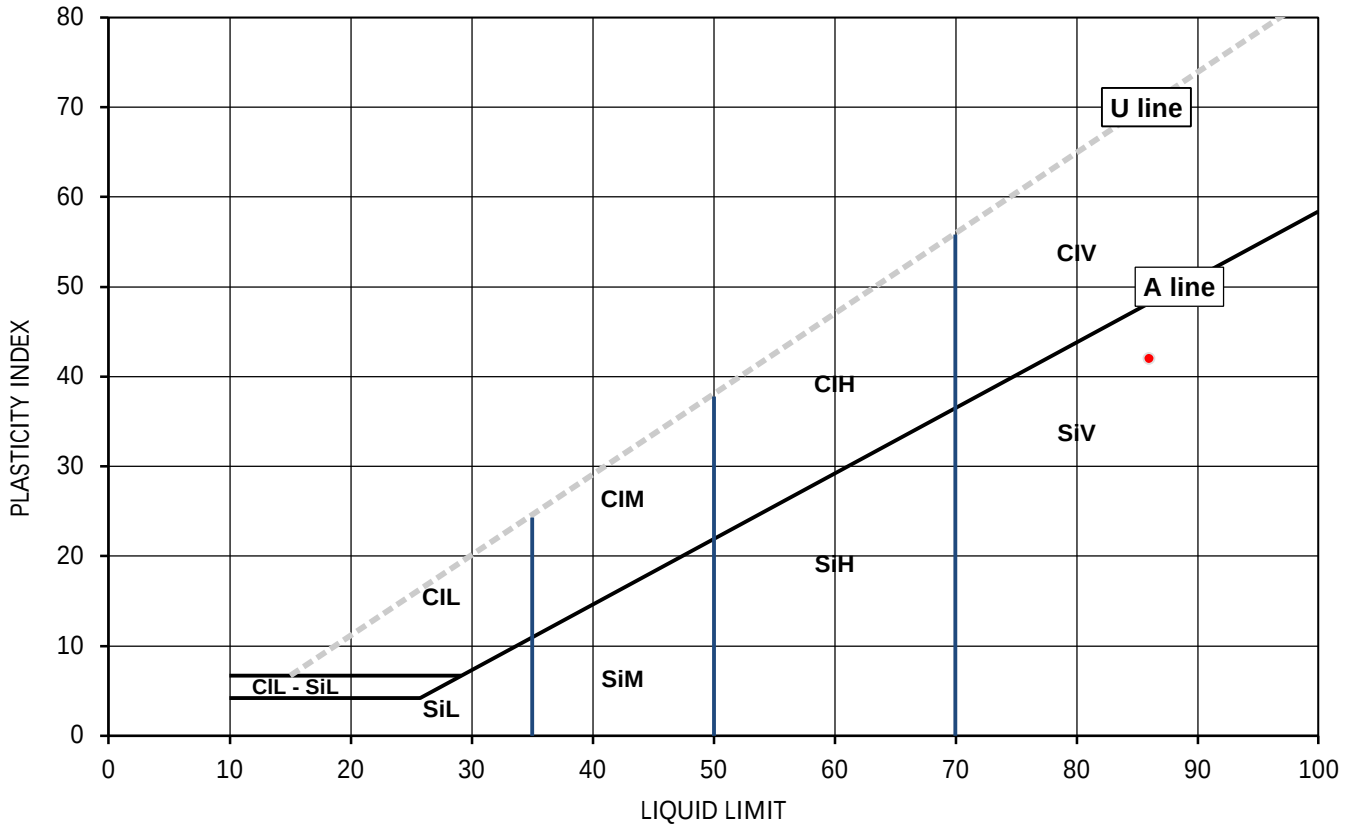
Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	05/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382828	Depth Top [m]:	0.90
Hole No.:	WS07	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown slightly silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
42	86	44	42	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	08/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

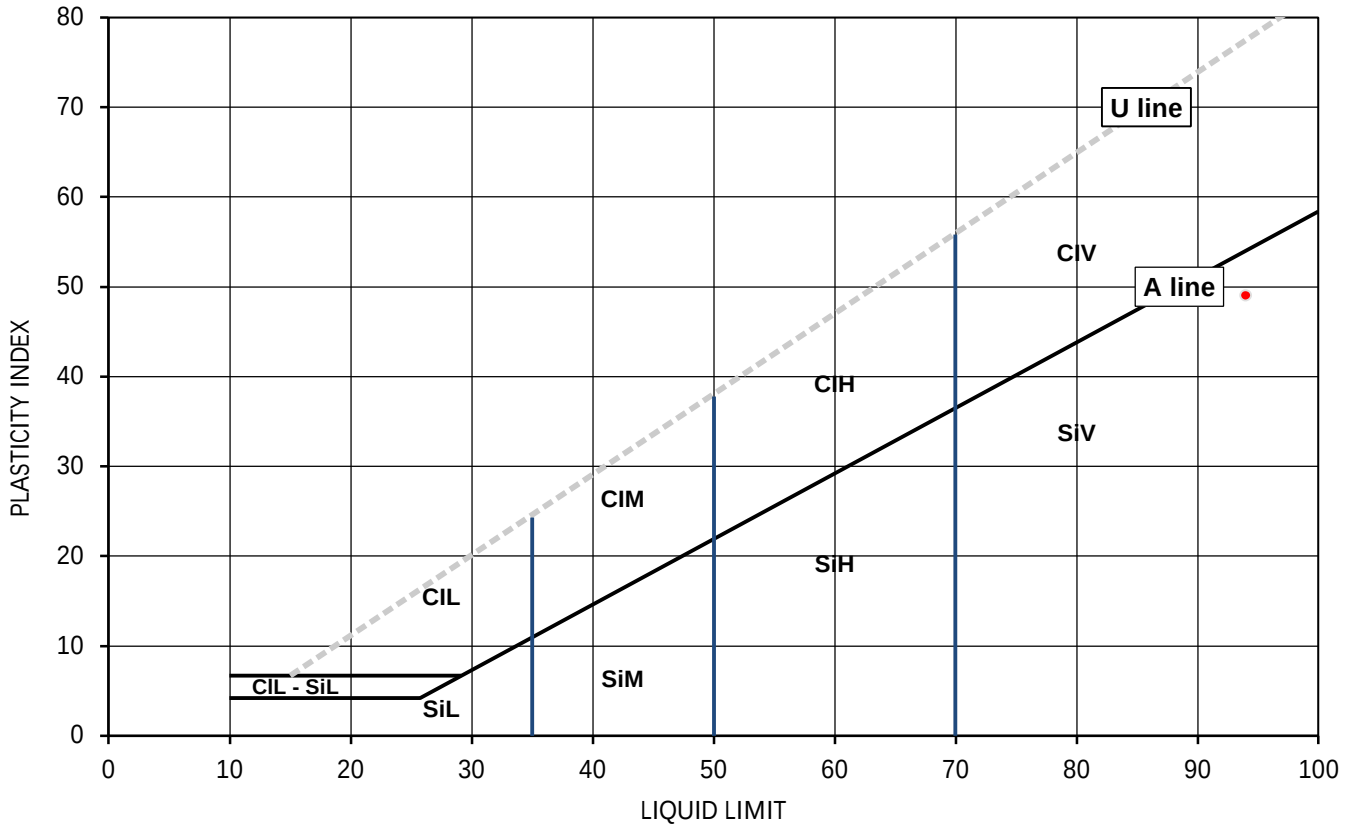
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382829	Depth Top [m]:	1.00
Hole No.:	TP03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown gravelly CLAY		

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
43	94	45	49	38



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

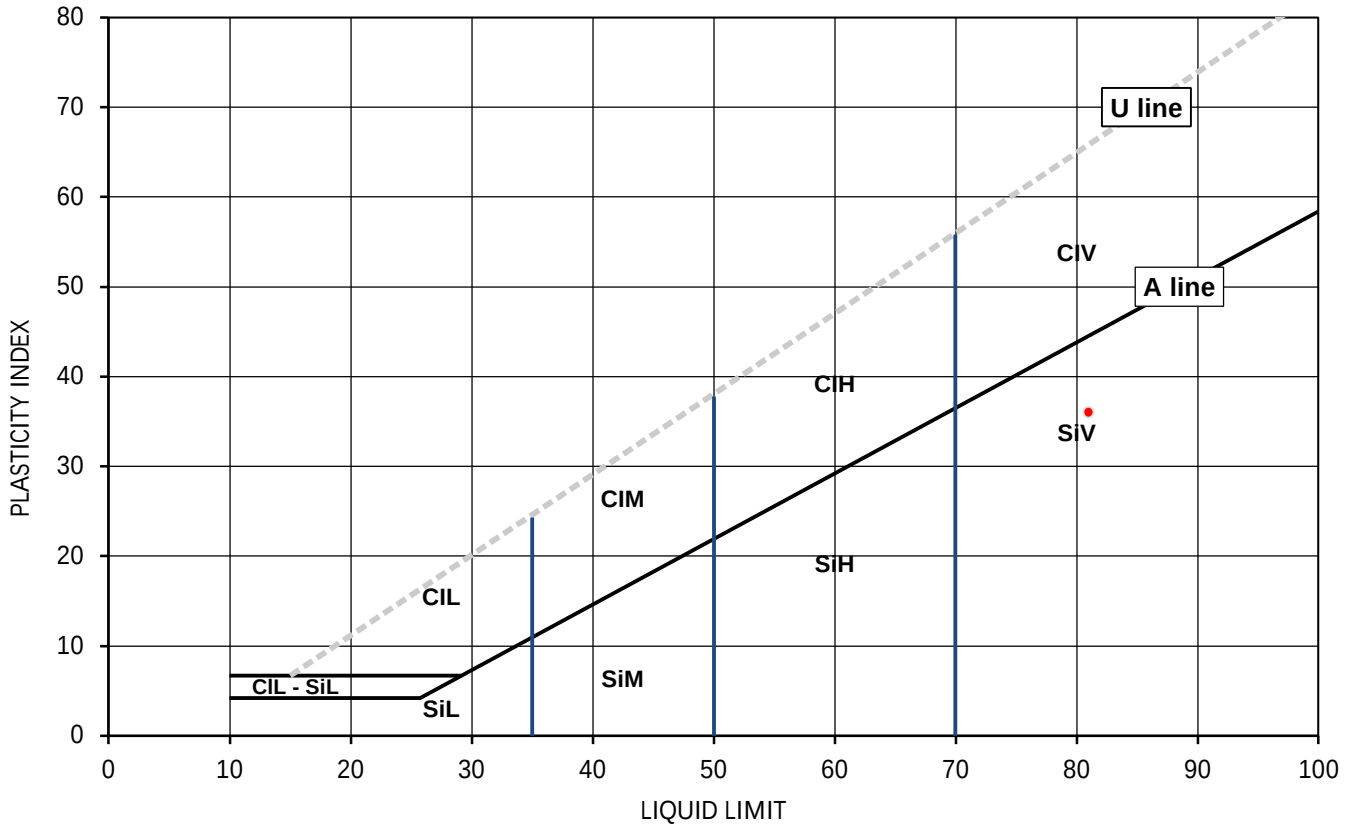
Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	08/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382830	Depth Top [m]:	0.90
Hole No.:	TP07	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown slightly silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
45	81	45	36	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

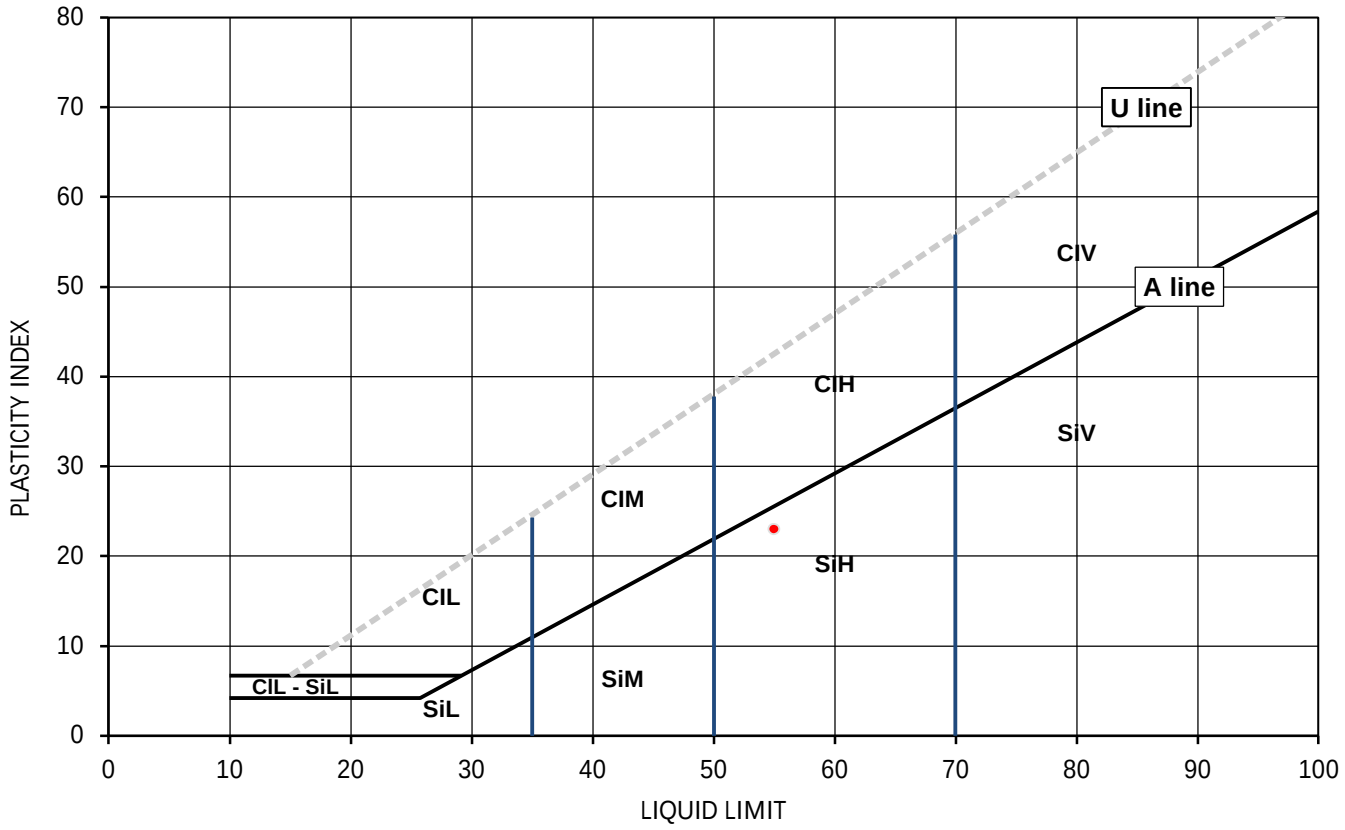
Client:	Mewies Engineering Consultants	Client Reference:	27485
Client Address:	The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB	Job Number:	22-77092
		Date Sampled:	08/08/2022
		Date Received:	09/08/2022
Contact:	Chris Wall	Date Tested:	18/08/2022
Site Address:	Burley Appliances, Lands End Way, Oakham	Sampled By:	Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2382831	Depth Top [m]:	1.00
Hole No.:	TP08	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
29	55	32	23	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Dudzinska Anna

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 232.12

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Client: Mewies Engineering Consultants

Client Address: The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB

Contact: Chris Wall

Site Address: Burley Appliances, Lands End Way, Oakham

Client Reference: 27485
Job Number: 22-77092
Date Sampled: 05/08 - 08/08/2022
Date Received: 09/08/2022
Date Tested: 18/08/2022
Sampled By: Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2382829	TP03	Not Given	1.00	Not Given	D	Brown gravelly CLAY	Atterberg 1 Point	43		38	94	45	49						
2382830	TP07	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY	Atterberg 1 Point	45		100	81	45	36						
2382831	TP08	Not Given	1.00	Not Given	D	Brown slightly sandy CLAY	Atterberg 1 Point	29		100	55	32	23						
2382826	WS01	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY	Atterberg 1 Point	36		100	73	36	37						
2382827	WS06	Not Given	0.90	Not Given	D	Yellowish brown very sandy CLAY	Atterberg 1 Point	31		100	70	34	36						
2382828	WS07	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY	Atterberg 1 Point	42		100	86	44	42						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 234.14

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mewies Engineering Consultants

Client Address: The Old Chapel, Station Road,
Hugglescote, Leicestershire,
LE67 2GB

Contact: Chris Wall

Site Address: Burley Appliances, Lands End Way, Oakham

Client Reference: 27485
Job Number: 22-77092
Date Sampled: 05/08 - 08/08/2022
Date Received: 09/08/2022
Date Tested: 18/08/2022
Sampled By: Client - CW

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2382829	TP03	Not Given	1.00	Not Given	D	Brown gravelly CLAY		43	Sample was quartered, oven dried at 106 °C			
2382830	TP07	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY		45	Sample was quartered, oven dried at 106 °C			
2382831	TP08	Not Given	1.00	Not Given	D	Brown slightly sandy CLAY		29	Sample was quartered, oven dried at 106 °C			
2382826	WS01	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY		36	Sample was quartered, oven dried at 106 °C			
2382827	WS06	Not Given	0.90	Not Given	D	Yellowish brown very sandy CLAY		31	Sample was quartered, oven dried at 106 °C			
2382828	WS07	Not Given	0.90	Not Given	D	Yellowish brown slightly silty CLAY		42	Sample was quartered, oven dried at 106 °C			

Comments:

Signed:

Anna Dudzinska
PL Deputy Head of Reporting Team
for and on behalf of i2 Analytical Ltd

Date Reported: 25/08/2022

GF 099.16

MEC
Development Technical Consultants

APPENDICES

APPENDIX D

Chris Wall
Mewies Engineering Consultants
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

e: CHRIS.WALL@M-EC.CO.UK

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 22-77295

Project / Site name:	Burley Appliances Lands End Wsay Oakham	**Samples received on:**	09/08/2022
Your job number:	27485	**Samples instructed on/ Analysis started on:**	10/08/2022
Your order number:	POP004947	**Analysis completed by:**	18/08/2022
Report Issue Number:	1	**Report issued on:**	18/08/2022
Samples Analysed:	10 soil samples		

Signed: [redacted]

Dominika Warjan
Junior Reporting Specialist
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: 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

Lab Sample Number				2384004	2384005	2384006	2384007	2384008
Sample Reference				WS01	WS01	WS02	WS03	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.40	0.55	0.40
Date Sampled				05/08/2022	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	57	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	14	7.5	15	5.3
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	BPA	N/A	BPA	BPA	BPA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	8.1	8.4	7.9	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	180	54	88	39	14
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.09	0.027	0.044	0.02	0.0072
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	89.8	26.8	44.2	19.5	7.2
Organic Matter (automated)	%	0.1	MCERTS	3.4	1.7	0.2	2.1	0.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.88	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.78	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.73	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.54	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.62	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.52	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.3	< 0.80	< 0.80	< 0.80	< 0.80

Analytical Report Number: 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

Lab Sample Number				2384004	2384005	2384006	2384007	2384008
Sample Reference				WS01	WS01	WS02	WS03	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.40	0.55	0.40
Date Sampled				05/08/2022	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	63	63	17	52	22
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.2	0.2	2.4	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	98	100	7.8	100	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	75	67	3.1	55	34
Lead (aqua regia extractable)	mg/kg	1	MCERTS	78	39	2.2	41	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	68	70	6.5	61	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	190	200	16	170	64
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	190	160	12	150	67
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	-	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	-	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	-	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	-	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	14	-	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	23	-	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

Lab Sample Number				2384009	2384010	2384011	2384012	2384013
Sample Reference				WS04	TP01	TP02	TP05	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.65	0.10	0.10	0.55	0.10
Date Sampled				05/08/2022	08/08/2022	08/08/2022	08/08/2022	08/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	3.3	10	11	9.5
Total mass of sample received	kg	0.001	NONE	0.3	1.3	1.3	1.3	1.3

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	BPA	BPA	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.1	6.9	7.8	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	6.9	7.4	4.5	3.1	7.6
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0035	0.0037	0.0023	0.0016	0.0038
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	3.5	3.7	2.3	1.6	3.8
Organic Matter (automated)	%	0.1	MCERTS	1.8	4.2	6.5	0.9	3.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.71	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.4	0.61	< 0.05	0.38
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.3	0.59	< 0.05	0.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.61	0.48	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.82	0.38	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.58	0.28	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.52	0.33	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.57	0.36	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	6.44	3.03	< 0.80	< 0.80

Analytical Report Number: 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

Lab Sample Number				2384009	2384010	2384011	2384012	2384013
Sample Reference				WS04	TP01	TP02	TP05	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.65	0.10	0.10	0.55	0.10
Date Sampled				05/08/2022	08/08/2022	08/08/2022	08/08/2022	08/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	50	59	61	44	83
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.6	1.2	0.6	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	100	110	97	68	120
Copper (aqua regia extractable)	mg/kg	1	MCERTS	48	76	76	89	76
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40	78	68	24	86
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	57	61	55	53	77
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	160	180	160	150	230
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	210	200	140	200
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

* 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 *
2384004	WS01	None Supplied	0.3	Brown clay and loam with gravel.
2384005	WS01	None Supplied	0.6	Brown clay and loam with gravel.
2384006	WS02	None Supplied	0.4	Light brown sandy loam with gravel and stones.
2384007	WS03	None Supplied	0.55	Brown clay and loam with gravel.
2384008	WS04	None Supplied	0.4	Brown sandy loam with rubble.
2384009	WS04	None Supplied	0.65	Brown clay and loam with gravel.
2384010	TP01	None Supplied	0.1	Brown clay and loam with gravel and vegetation.
2384011	TP02	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2384012	TP05	None Supplied	0.55	Brown clay and loam with gravel and vegetation.
2384013	TP06	None Supplied	0.1	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
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.	L038-PL	D	MCERTS
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	A001-PL	D	ISO 17025
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	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	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
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.	L019-UK/PL	D	NONE
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 (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 22-77295
Project / Site name: Burley Appliances Lands End Wsay Oakham

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

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-78329

Project / Site name:	Burley Appliances, Lands End Way, Oakham	**Samples received on:**	15/08/2022
Your job number:	27485	**Samples instructed on/ Analysis started on:**	17/08/2022
Your order number:	POP004969	**Analysis completed by:**	23/08/2022
Report Issue Number:	1	**Report issued on:**	23/08/2022
Samples Analysed:	2 soil samples		

Signed: [redacted]

Dominika Warjan
Junior Reporting Specialist
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

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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: 22-78329
Project / Site name: Burley Appliances, Lands End Way, Oakham
Your Order No: POP004969

Lab Sample Number				2390096	2390097
Sample Reference				HDP01	HDP02
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.40	0.00-0.30
Date Sampled				12/08/2022	13/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.2	8.3
Total mass of sample received	kg	0.001	NONE	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	BPA	BPA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	20	60
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.01	0.03
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	10.1	30.1
Organic Matter (automated)	%	0.1	MCERTS	3.7	4.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.24	0.31
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.58	0.96
Pyrene	mg/kg	0.05	MCERTS	0.54	0.87
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.35	0.62
Chrysene	mg/kg	0.05	MCERTS	0.35	0.53
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.41	0.59
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	0.32
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	0.47
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.2	0.26
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.26	0.33

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.43	5.26

Analytical Report Number: 22-78329
Project / Site name: Burley Appliances, Lands End Way, Oakham
Your Order No: POP004969

Lab Sample Number				2390096	2390097
Sample Reference				HDP01	HDP02
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.40	0.00-0.30
Date Sampled				12/08/2022	13/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	74	60
Boron (water soluble)	mg/kg	0.2	MCERTS	2	2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	100	91
Copper (aqua regia extractable)	mg/kg	1	MCERTS	62	51
Lead (aqua regia extractable)	mg/kg	1	MCERTS	73	55
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	67	51
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	180	150
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	140
PCBs by GC-MS					
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001
Total PCBs by GC-MS					
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-78329
Project / Site name: Burley Appliances, Lands End Way, Oakham

* 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 *
2390096	HDP01	None Supplied	0.00-0.40	Brown loam and clay with gravel and vegetation.
2390097	HDP02	None Supplied	0.00-0.30	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 22-78329
Project / Site name: Burley Appliances, Lands End Way, Oakham

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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
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.	L038-PL	D	MCERTS
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	A001-PL	D	ISO 17025
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	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	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
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.	L019-UK/PL	D	NONE
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 (Skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 22-78329
Project / Site name: Burley Appliances, Lands End Way, Oakham

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

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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.

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Analytical Report Number : 22-83951

Project / Site name:	Burley Appliances Lands End Wsay Oakham	**Samples received on:**	09/08/2022
Your job number:	27485	**Samples instructed on/ Analysis started on:**	14/09/2022
Your order number:	POP005111	**Analysis completed by:**	29/09/2022
Report Issue Number:	1	**Report issued on:**	29/09/2022
Samples Analysed:	4 soil samples		

[redacted]

Signed:

Dominika Warjan
Junior Reporting Specialist
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

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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: 22-83951
Project / Site name: Burley Appliances Lands End Wsay Oakham

Lab Sample Number				2423769	2423770	2423771	2423772
Sample Reference				WS01	WS04	TP02	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.65	0.10	0.10
Date Sampled				05/08/2022	05/08/2022	08/08/2022	08/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)							
Stone Content	%	0.1	NONE	42	29	16	7.5
Moisture Content	%	0.01	NONE	13	14	10	9.5
Total mass of sample received	kg	0.001	NONE	0.8	0.3	1.3	1.3

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	58	43	56	61

PBET Results (Bioaccessibile Fraction)

Arsenic (Stomach)	%	0.5	NONE	0.2	0.3	0.3	0.3
Arsenic (Intestine 1)	%	0.5	NONE	0.9	0.7	0.4	0.9
Arsenic (Intestine 2)	%	0.5	NONE	0.9	0.8	0.2	0.8

Bioaccessible Fraction %	Maximum % BAF	0.9 % (I2)	0.8 % (I2)	0.4 % (I1)	0.9 % (I1)

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-83951
Project / Site name: Burley Appliances Lands End Wsay Oakham

* 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 *
2423769	WS01	None Supplied	0.3	Brown clay and loam with gravel.
2423770	WS04	None Supplied	0.65	Brown clay and loam with gravel.
2423771	TP02	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2423772	TP06	None Supplied	0.1	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 22-83951
Project / Site name: Burley Appliances Lands End Wsay Oakham

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
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.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	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.	L019-UK/PL	D	NONE
PBET	In House Method	In house method based on Ruby et.al.		D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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.

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Analytical Report Number : 22-77099

Project / Site name:	Burley Appliances, Lands End Way, Oakham	**Samples received on:**	09/08/2022
Your job number:	27485	**Samples instructed on/ Analysis started on:**	09/08/2022
Your order number:	POP004948	**Analysis completed by:**	22/08/2022
Report Issue Number:	1	**Report issued on:**	23/08/2022
Samples Analysed:	8 soil samples		

Signed: [redacted]

Martyna Langer
Junior Reporting Specialist
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

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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: 22-77099
Project / Site name: Burley Appliances, Lands End Way, Oakham
Your Order No: POP004948

Lab Sample Number				2382863	2382864	2382865	2382866	2382867
Sample Reference				WS01	WS03	WS04	WS08	TP01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	1.00	1.60	0.90	1.95
Date Sampled				05/08/2022	05/08/2022	05/08/2022	05/08/2022	08/08/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	15	11	9.9	11
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.7

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.7	7.7	7.8	8.4
Total Sulphate as SO4	%	0.005	MCERTS	0.066	0.045	0.03	0.123	0.112
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.045	0.072	0.0064	0.016	0.017
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	44.7	71.7	6.4	16.2	17
Total Sulphur	%	0.005	MCERTS	0.054	0.104	0.248	0.083	0.072

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-77099
Project / Site name: Burley Appliances, Lands End Way, Oakham
Your Order No: POP004948

Lab Sample Number				2382868	2382869	2382870
Sample Reference				TP04	TP06	TP08
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.40	1.80
Date Sampled				08/08/2022	08/08/2022	08/08/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)						
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.3	40	10
Total mass of sample received	kg	0.001	NONE	0.7	0.7	0.7

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.9	7.8	7.1
Total Sulphate as SO4	%	0.005	MCERTS	0.102	0.131	0.371
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.026	1.7
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.7	26.2	1680
Total Sulphur	%	0.005	MCERTS	0.063	0.059	9.53

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-77099
Project / Site name: Burley Appliances, Lands End Way, Oakham

* 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 *
2382863	WS01	None Supplied	1.6	Brown clay and sand with gravel.
2382864	WS03	None Supplied	1	Brown clay and sand with gravel.
2382865	WS04	None Supplied	1.6	Brown clay and sand with gravel.
2382866	WS08	None Supplied	0.9	Brown clay and sand with gravel.
2382867	TP01	None Supplied	1.95	Brown clay and sand with gravel.
2382868	TP04	None Supplied	0.8	Brown clay and sand with gravel.
2382869	TP06	None Supplied	1.4	Brown silt with gravel.**
2382870	TP08	None Supplied	1.8	Brown clay and sand with gravel.

**Non MCERTS Matrix

Analytical Report Number : 22-77099
Project / Site name: Burley Appliances, Lands End Way, Oakham

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
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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
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.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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.

MEC
Development Technical Consultants

APPENDICES

APPENDIX E

CLEA Software Version 1.071

Report generated 10-Oct-22

Report title 27485-GEO-0401

Created by Chris Wall at M-EC

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group						
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic	6.10E+02	1.21E+02	NR	0.20	1.00	NR	NR	No	No	Yes	No	No	No	No	No	No
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Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group						
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic	99.9	0.1	0.0	100.0	1.21E+02	NR	6.05E+01	5.15E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E-02	4.84E-02	2.78E-02	3.99E-02	2.42E-02	1.33E-01
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	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	8.08E-06	3.94E-05	1.20E-05	2.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})	Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})	[illegible] (µg day^{-1})	[illegible] (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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		Soil-to-air volatilization factor (cm^3 g^{-1})	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for leafy vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
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Environment Agency

	Soil-to-air volatilisation factor (cm^3 g^{-1})	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shoot vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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CLEA Software Version 1.071

Report generated 10/10/2022

Report title 27485-GEO-0401

Created by Chris Wall at M-EC

BASIC SETTINGS

Land Use Residential with produce (C4SL)

Building Small terraced house
Receptor Female (res C4SL) Start age class 1 End age class 6 Exposure Duration 6 years
Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion ☐	Dermal contact with indoor dust ☐	Inhalation of indoor dust ☐
Consumption of homegrown produce ☐	Dermal contact with soil ☐	Inhalation of soil dust ☐
Soil attached to homegrown produce ☐		Inhalation of indoor vapour ☐
		Inhalation of outdoor vapour ☐

Land Use Residential with produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of particulates vapour, indoor	Inhalation of particulates vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

	MEAN RATES						90TH PERCENTILE RATES					
Age Class	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied?Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Soil Sandy loam

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter m (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	6.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	3.48E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($m^2\ m^{-2}$)	0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

Summary of Contaminant Concentrations Against Generic Assessment Criteria

Location ID	Determinant	Units	GAC	WS01	WS01	WS02	WS03	WS04	WS04	TP01	TP02	TP05	TP06	HDP01	HDP02
Depth (m bgl)			Residential with Consumption of Hoegrown Produce	0.30m	0.60m	0.40m	0.55m	0.40m	0.65m	0.10m	0.10m	0.55m	0.10m	0.00-0.40m	0.00-0.30m
Metals, Metalloids and Non-metals	Arsenic*	mg/kg	121	63	63	17	52	22	50	59	61	44	83	74	60
	Boron		290	1.3	1.2	0.2	2.4	0.3	0.9	1.6	1.2	0.6	1.3	2	2
	Cadmium		11	-	-	-	-	-	-	-	-	-	-	-	-
	Chromium III		910	98	100	7.8	100	27	100	110	97	68	120	100	91
	Chromium VI		6	-	-	-	-	-	-	-	-	-	-	-	-
	Copper		2,400	75	67	3.1	55	34	48	76	76	89	76	62	51
	Lead		200	78	39	2.2	41	15	40	78	68	24	86	73	55
	Mercury		1.2	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel		130	68	70	6.5	61	21	57	61	55	53	77	67	51
	Selenium		250	-	-	-	-	-	-	-	-	-	-	-	-
	Vanadium		410	190	200	16	170	64	160	180	160	150	230	180	150
	Zinc		3,700	190	160	12	150	67	140	210	200	140	200	180	140
Asbestos in Soil		N/A	N/A	Not-detected	NT	Not-detected	Not-detected	Not-detected	NT	Not-detected	Not-detected	NT	NT	Not-detected	Not-detected
Polycyclic Armoatic Hydrcarbons	Naphthalene	mg/kg	5.6	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene		420	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene		510	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene		400	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene		220	0.43	-	-	-	-	-	0.71	-	-	-	0.24	0.31
	Anthracene		5,400	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene		560	1.3	-	-	-	-	-	1.4	0.61	-	0.38	0.58	0.96
	Pyrene		1,200	1.1	-	-	-	-	-	1.3	0.59	-	0.4	0.54	0.87
	Benzo(a)anthracene		10.9	0.88	-	-	-	-	-	0.61	0.48	-	-	0.35	0.62
	Chrysene		22	0.78	-	-	-	-	-	0.82	0.38	-	-	0.35	0.53
	Benzo(b)fluoranthene		3	0.73	-	-	-	-	-	0.58	0.28	-	-	0.41	0.59
	Benzo(k)fluoranthene		93	0.54	-	-	-	-	-	0.52	0.33	-	-	0.19	0.32
	Benzo(a)pyrene		2.7	0.62	-	-	-	-	-	0.57	0.36	-	-	0.31	0.47
	Indeno(1,2,3-cd)pyrene		36	0.37	-	-	-	-	-	-	-	-	-	0.2	0.26
	Dibenz(a,h) anthracene		0.28	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(ghi)perylene		340	0.52	-	-	-	-	-	-	-	-	-	0.26	0.33
Monoaromatics and Oxygenates	Benzene	µg/kg	0.170	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	Toluene		290	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	Ethylbenzene		110	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	p & m-xylene		130	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	o-xylene		140	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
Petroleum Hydrocarbons	TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	78	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC6 - EC8		230	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC8 - EC10		66	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC10 - EC12		330	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC12 - EC16		2,400	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC16 - EC21		65,000	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic >EC21 - EC35			-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aliphatic (EC5 - EC35)		N/A	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC5 - EC7		140	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC7 - EC8		290	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC8 - EC10		83	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC10 - EC12		180	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC12 - EC16		330	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC16 - EC21		540	-	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic >EC21 - EC35		1,500	14	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT
	TPH-CWG - Aromatic (EC5 - EC35)		N/A	23	NT	-	-	-	NT	NT	NT	NT	NT	NT	NT

Key:

N/A - No GAC applicable.

NT - Not Tested

- Concentration reported below laboratory method detection limit

* Arsenic concentrations have been assessed against the SSAC derived from the CLEA Model

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APPENDICES

APPENDIX F

GAS AND GROUNDWATER MONITORING

Site:		Burley Appliances, Lands End Way, Oakham
Client:		Burley Appliances
Job No.:		27485
Date:		12 August 2022
Start / End Time:		12:36/ 13:52
Engineer:		JK
Monitoring Equipment:	**Gas Meter ID**	12175
	PID ID	2480
	Dip Tape	Blue
	Other	

NR = Not Recorded
Dry = No Groundwater

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Weather Conditions	**Start**	**End**
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	0	0
Wind Strength (m/s)	<0.1	3.9
Wind Direction (from)	NR	NR
Temperature (°C)	26.0	26.0
Barometric Pressure (mb)	1007	1005
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	100	100

Location Reference	**Differential Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					
Ambient Air Finish (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					
WS01	<0.01	<0.1	<0.1	<0.1	<0.1	2.5	2.5	15.1	15.1	<0.1	<0.1	9.1	Dry	1.80	NR		
WS02	<0.01	<0.1	<0.1	<0.1	<0.1	2.1	2.1	17.5	17.5	<0.1	35	40	Dry	2.04	NR		
WS03	<0.01	<0.1	<0.1	<0.1	<0.1	5.6	5.6	13.4	13.4	<0.1	<0.1	15.1	Dry	1.89	NR		
WS05	<0.01	<0.1	<0.1	<0.1	<0.1	0.9	0.9	20.7	20.7	<0.1	10	6.3	Dry	1.58	NR		
WS07	<0.01	<0.1	<0.1	<0.1	<0.1	5.4	5.4	5.7	5.7	<0.1	10	8.5	Dry	1.42	NR		
WS08	<0.01	<0.1	<0.1	<0.1	<0.1	2.0	2.0	19.8	19.8	<0.1	<0.1	10.7	Dry	1.78	NR		

GAS AND GROUNDWATER MONITORING

Site:		Burley Appliances, Lands End Way, Oakham
Client:		Burley Appliances
Job No.:		27485
Date:		16 August 2022
Start / End Time:		
Engineer:		CC + TB
Monitoring Equipment:	**Gas Meter ID**	12175
	PID ID	2475
	Dip Tape	Blue
	Other	

NR = Not Recorded
Dry = No Groundwater

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Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	8	6
Wind Strength (m/s)	1.6	1.4
Wind Direction (from)	NR	NR
Temperature (°C)	21.5	20.0
Barometric Pressure (mb)	995	995
(Rising/ Falling)	Static	
PID - Air	<0.1	<0.1
PID - Calibration Gas	100	100

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.7	20.7	<0.1	<0.1	<0.1					
Ambient Air Finish (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.8	20.8	<0.1	<0.1	<0.1					
WS01	<0.01	<0.1	<0.1	<0.1	<0.1	3.1	3.1	14.7	14.7	<0.1	<0.1	19.0	Dry	1.80	NR		
WS02	<0.01	<0.1	<0.1	<0.1	<0.1	2.3	2.3	17.6	17.6	<0.1	12	28.1	Dry	2.04	NR		
WS03	<0.01	<0.1	<0.1	<0.1	<0.1	3.5	2.7	17.4	17.4	<0.1	<0.1	7.6	Dry	1.89	NR		
WS05	<0.01	<0.1	<0.1	<0.1	<0.1	0.9	0.9	20.3	20.3	<0.1	10	8.2	Dry	1.58	NR		
WS07	<0.01	<0.1	<0.1	<0.1	<0.1	6.5	6.5	5.7	5.7	<0.1	10	1.6	Dry	1.42	NR		
WS08	<0.01	<0.1	<0.1	<0.1	<0.1	2.1	2.1	19.5	19.5	<0.1	10	12.1	Dry	1.79	NR		

GAS AND GROUNDWATER MONITORING

Site:		Burley Appliances, Lands End Way, Oakham
Client:		Burley Appliances
Job No.:		27485
Date:		26 August 2022
Start / End Time:		
Engineer:		DW
Monitoring Equipment:	**Gas Meter ID**	**2975**
	PID ID	**2480**
	Dip Tape	**Green**
	Other	

NR = Not Recorded
Dry = No Groundwater

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Weather Conditions	Start	End
(Dry / Raining)	Dry	Dry
Cloud Cover (Oktas)	2	4
Wind Strength (m/s)	NR	NR
Wind Direction (from)	NR	NR
Temperature (°C)	20.0	20.0
Barometric Pressure (mb)	1007	1007
(Rising/ Falling)	Static	
PID - Air	<0.1	<0.1
PID - Calibration Gas	100	100

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.9	20.9	<0.1	<0.1	<0.1					
Ambient Air Finish (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.9	20.9	<0.1	<0.1	<0.1					
WS01	<0.01	<0.1	<0.1	<0.1	<0.1	3.0	3.0	14.5	14.5	<0.1	<0.1	10.0	Dry	1.82	NR		
WS02	<0.01	<0.1	<0.1	<0.1	<0.1	2.4	2.4	17.6	17.6	<0.1	<0.1	34.2	Dry	2.04	NR		
WS03	<0.01	<0.1	<0.1	<0.1	<0.1	6.7	6.7	10.4	10.4	<0.1	<0.1	2.7	Dry	1.84	NR		
WS05	<0.01	<0.1	<0.1	<0.1	<0.1	0.9	0.9	20.0	20.0	<0.1	<0.1	7.1	Dry	1.55	NR		
WS07	<0.01	<0.1	<0.1	<0.1	<0.1	7.1	7.1	0.3	0.3	<0.1	<0.1	6.3	Dry	1.42	NR		
WS08	<0.01	<0.1	<0.1	<0.1	<0.1	2.1	2.1	18.4	18.4	<0.1	<0.1	6.3	NR	NR	NR		Could not remove bung

GAS AND GROUNDWATER MONITORING

Site:		Burley Appliances, Lands End Way, Oakham
Client:		Burley Appliances
Job No.:		27485
Date:		2nd September 2022
Start / End Time:		10:02-11:08
Engineer:		JK
Monitoring Equipment:	**Gas Meter ID**	
	PID ID	
	Dip Tape	
	Other	

NR = Not Recorded
Dry = No Groundwater

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Weather Conditions	**Start**	**End**
(Dry / Raining)	Rain	Rain
Cloud Cover (Oktas)	8	8
Wind Strength (m/s)	NR	NR
Wind Direction (from)	NR	NR
Temperature (°C)	16.0	19.0
Barometric Pressure (mb)	1002	1001
(Rising/ Falling)	Falling	
PID - Air	<0.1	<0.1
PID - Calibration Gas	100	100

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.7	20.7	<0.1	<0.1	<0.1					
Ambient Air Finish (Calibration)	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	19.8	19.8	<0.1	<0.1	<0.1					
WS01	<0.01	<0.1	<0.1	<0.1	<0.1	3.2	3.2	14.2	14.2	<0.1	<0.1	9.4	Dry	1.81	NR		
WS02	<0.01	<0.1	<0.1	<0.1	<0.1	2.6	2.6	17.7	17.7	<0.1	<0.1	28.1	Dry	2.05	NR		
WS03	NR	NR	NR	NR	<0.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
WS05	<0.01	<0.1	<0.1	<0.1	<0.1	0.6	0.6	20.4	20.4	<0.1	<0.1	4.1	Dry	1.58	NR		
WS07	<0.01	<0.1	<0.1	<0.1	<0.1	7.2	7.2	0.1	0.1	<0.1	<0.1	6.0	Dry	1.42	NR		
WS08	<0.01	<0.1	<0.1	<0.1	<0.1	2.0	2.0	19.6	19.6	<0.1	<0.1	8.1	Dry	1.79	NR		

SITE WIDE		GSV	
Maximum Carbon Dioxide Concentration (steady)	7.2 %	0.0072	(CO2)
Maximum Methane Concentration (peak)	0.1 %	0.0001	(CH4)
Maximum Flow Rate	0.1 l/hr	0.0072	(worst)
NHBC	Amber 1		
Characteristic Situation (W&C)	2		

Borehole Ref.	Flow* (l/hr)		Carbon Dioxide (% v/v)			Methane (% v/v)			GSV (l/hr)	Borehole Specific Classification	
	Min.	Max.	Min.	Max.	Avg.	Min.	Max.	Avg.		CS	NHBC
WS01	<0.1	<0.1	2.5	3.2	3.0	<0.1	<0.1	<0.1	0.003	1	*Green*
WS02	<0.1	<0.1	2.1	2.6	2.4	<0.1	<0.1	<0.1	0.003	1	*Green*
WS03	<0.1	<0.1	2.7	6.7	5.0	<0.1	<0.1	<0.1	0.007	2	Amber 1
WS05	<0.1	<0.1	0.6	0.9	0.8	<0.1	<0.1	<0.1	0.001	1	*Green*
WS07	<0.1	<0.1	5.4	*7.2*	6.6	<0.1	<0.1	<0.1	0.007	2	Amber 1
WS08	<0.1	<0.1	2.0	2.1	2.1	<0.1	<0.1	<0.1	0.002	1	*Green*

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