Phase II Site Investigation

at: Duckmoor, Land off Wooddale Lane, Billingshurst, West Sussex

for: Bellway Homes Ltd (South Division)

Report Reference: 3750859 R01 (00)

Report Date: 07 April 2025

leap environmental
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LEAP ENVIRONMENTAL GENERAL NOTES

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

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EXECUTIVE SUMMARY

The site, referred to as 'Duckmoor', comprises three fields split into parcels bounded by mature trees on all sides, covering approximately 6.00 ha and located in a rural area off Wooddale Lane, Billingshurst, RH14 9DA. The site is gently sloping, and is located on average at 40.00 m AOD. The western boundary is adjacent to a residential housing and the eastern boundary is adjacent to Wooddale Lane. Adjacent to the northern boundary are further grassed fields and beyond the south boundary is a field land parcel with a private property. It is proposed to redevelop the two western fields of the site with 120 residential dwellings, with associated access road infrastructure, public open space and surface water attenuation ponds. The third eastern field is proposed to comprise landscaped public open space.

The site is mapped as being underlain by the Weald Clay Formation (Mudstone) with Weald Clay Formation (Sandstone) mapped across the northeastern edge of the site. The sandstone of the formation is classed as a Secondary A Aquifer whereas the mudstone is classed as unproductive strata. No superficial deposits are mapped.

Historical landfill records outline a landfilled area off-site, immediately adjacent to the south-east boundary of the subject site. The deposited wastes listed in the landfill records include inert, commercial and household waste.

Intrusive investigation comprised 16 trial pits and 6 windowless boreholes installed with monitoring wells across the site. The investigation concentrated on the western two fields in which the residential development is located.

Ground conditions encountered topsoil comprising silty clay to a maximum depth of 0.30 m bgl, over firm to very stiff silty clay of the Weald Clay Formation to a maximum depth of 3.00 m bgl, over weak mudstone of the Weald Clay Formation to a maximum depth of 4.00 m bgl, the extent of the investigation. Groundwater was not encountered as consistent strikes during the intrusive works, with some seepage recorded at various depths, considered to represent perched groundwater within the low-permeability clay. Groundwater was recorded in two of the six monitoring locations in the central northern and northwestern corner of the site, between 0.60 m and 2.64 m bgl.

An allowable bearing capacity of 100kPa is recommended for the firm to very stiff clays of the Weald Clay Formation below about 1.00 m. Deepening of foundations is required where located within the zone of influence of trees to HIGH VCP precautions. Piled foundations may be the preferred option where foundations will require deepening. Recommendations are given for additional work required for the detailed design stage. Allowance should be made for deeper rotary-drilled boreholes to provide design parameters for piled foundation design.

A preliminary assessment of the foundation type using our carbon calculator indicates that assuming the foundations summarised above are utilised onsite then traditional footings would be the less carbon intensive option. However, where deepening is required, piled foundations should be considered where traditional foundations extend below 2.20 m bgl.

Soil sulphates in the Weald Clay Formation fall within BRE design class DS3 and the site conditions fall within the ACEC class AC-2s.

Soakage testing was not within the scope of the investigation, however, it is anticipated that the clay and mudstone of the Weald Clay Formation onsite will not be suitable for soakaway drainage and allowance should be made for water to be piped off-site

CBR testing was beyond the scope of works. However, a preliminary design CBR value of 2.5% is recommended for the Weald Clay Formation soils.

The site is gently sloping. Recommendations for development on sloping sites with a clay geology have been provided.

A geo-environmental risk assessment has been carried out. Contamination testing of the soils identified no exceedances above the selected generic assessment criteria for the proposed residential with homegrown produce land use. Therefore, no requirements are given for remediation at the site.

3 land gas monitoring visits have been carried out due to the nearby landfill located adjacent to the south-east of the site. The results indicate that the site is classified as a Characteristic Situation 1 (CS1) gas risk, meaning that gas protection measures are not indicated as necessary at this stage.

As with any redevelopment site, there is always the risk of hitherto undetected contamination, and it is recommended that groundworkers should remain vigilant for any potential signs of contamination throughout to redevelopment.

Recommendations are given for the sustainable reuse on site, where it is not possible to reuse the soils on site or offsite the natural Weald Clay Formation soils are expected to be classified as inert waste.

1 INTRODUCTION

1.1 Authority

RSK Environment Ltd trading as Leap Environmental (hereafter referred to as LEAP) were engaged by Bellway Homes Ltd (South Division) (herein referred to as the "Client") to carry out a Phase II Site Investigation at the site referred to as Duckmoor, Land off Wooddale Lane, Billingshurst, West Sussex.

The works were undertaken by means of LEAP's fee proposal letter dated 20 January 2025 with reference LPQ11945 and including RSK Standard Terms and Conditions [Issue No.12 July 2023], which forms the appointment between LEAP and the Client.

References in this report to 'we', 'us' or 'our' shall mean [Leap Environmental] as a trading name of RSK Environment Limited (company no.SC115530) at registered address 65 Sussex Street Glasgow G41 1DX.

The report should be read and used in accordance with the limitations and constraints identified in the report text, and at **Appendix A** – Service Constraints.

The site is approximately 6Ha in size and is located at NGR: 509710,126150, with the nearest postcode being RH14 9DA (Drawing No. 11101, **Appendix B**).

1.2 Objective

LEAP understands that the site is currently owned by Bellway Homes Ltd (South London), and it is proposed to redevelop the site with 120 residential dwellings, access roads, infrastructure, public open space and surface water attenuation ponds, as per the Client provided Proposed Development Plan (Drawing No. 11601, **Appendix B)**.

The proposed development is currently at a final design phase and has been assessed in accordance with BS EN 1997[1], as being a Geotechnical Category 1 structure.

The objectives of this report are to:

- Provide information on the geotechnical and environmental quality of the ground present on the site with respect to the proposed development.
- Assess the potential health and other environmental risks posed by the site to the proposed development and to other specifically identified receptors.
- Assess the potential for offsite contamination to adversely affect the proposed development.

1.3 Previous studies

The site has been the subject of previous investigations by LEAP. The reader is referred to the following site investigation report which should be read in conjunction with this report.

[1] BS EN 1997-1(2004)+A1:2013 Eurocode 7:Geotechnical Design: General Rules

- Phase I Desk Study & Site Reconnaissance Report Issue 2 by LEAP for Reside Developments Ltd, report reference: LP2373, dated: 16 December 2020.

1.4 Scope of works

This report describes a two-stage process whereby the site is investigated, and risks are assessed. The terms geotechnical and geoenvironmental are referred to throughout the report.

Geoenvironmental refers principally to the chemical nature of the ground and the degree of soil, water and/or land gas contamination and the impact that contamination may have on current or future development and also on the wider environment.

Geotechnical refers to all other aspects of the ground conditions and the impact they may have on the physical construction of existing or future development, principally foundations, slope stability, drainage, pavement and road design and groundwater control.

The investigation comprises two phases of work.

1.4.1 Phase 1 review scope

The first part of this report includes a summary of the Phase 1 desk study and site reconnaissance report, undertaken by LEAP. The desk study and site reconnaissance have been used to develop an initial conceptual site model, which forms the basis for the site investigation strategy. The initial site conceptual model is used to identify geotechnical and geoenvironmental hazards and the qualitative degree of risk associated with them. In terms of the geoenvironmental assessment the conceptual site model is used to identify potential sources of contamination, potential receptors and pathways by which the two may be connected. These are known as possible contaminant linkages, and it is these contaminant linkages that are key to contaminated land risk assessment.

The Phase I investigation is also referred to as a Preliminary Investigation[2].

1.4.2 Intrusive investigation scope

The Phase II work comprises intrusive investigation, onsite monitoring and laboratory analysis. The results of this are used to validate and/or update the initial site conceptual model. This phase of site investigation comprised the following tasks:

- 6 windowless boreholes drilled to a maximum depth of 5.00 m bgl with a tracked rig,
- 6 ground gas monitoring wells installed to a maximum depth of 3.00 m bgl with 3 subsequent monitoring visits.
- 20 machine excavated trial pits to a maximum depth of 3.00 m bgl.
- In-situ geotechnical testing including Standard Penetrometer Tests in the boreholes and Hand Shear Vane Tests in the trial pits.
- Geotechnical Laboratory Testing including Atterberg Limit Tests, and Sulphate Tests.

[2] BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice.

- Chemical Laboratory tests including 8 LEAP Extended Soil Suites, 2 TPH CWG tests, 2 Full Waste Acceptance Criteria tests, and 6 No. Pesticide Screen tests.

The intrusive works were completed by contractors who have been scrutinised and are on LEAP's approved contractor list. The windowless sampling was carried out by AB Site Investigation Ltd, The machine excavated trial pits were carried out by Nicholls Plant Hire Ltd. All work was supervised by LEAP.

Selected samples of soil were scheduled for laboratory testing for a wide range of potential contaminants including metals, non-metals, polyaromatic and petroleum hydrocarbons and volatile organic compounds. The laboratory testing has been carried out by Chemtech Environmental at its laboratories in Newcastle.

Selected soil samples have been classified by laboratory analysis for geotechnical design purposes. The laboratory testing has been carried out by K4 Soils Laboratory at its laboratories in Watford.

The final stage in the geoenvironmental assessment comprises a quantitative risk assessment and revision of the preliminary Conceptual Site Model. Preliminary recommendations for remediation have been provided, based on various development assumptions which are detailed in the following section and in the text of this report. The risk assessment has been carried out in accordance with UK industry standards and in particular in accordance with LCRM[3] and BS10175:2011+A2:2017.

The final stage of the geotechnical assessment is the provision of preliminary soil parameters for use in geotechnical design, and broad recommendations for appropriate foundation options. It is intended that the Geotechnical Information section of this report will fulfil the general requirements of the Ground Investigation Report as set out in Section 6 of BS EN 1997-2:2007[4].

1.5 Sustainability considerations

1.5.1 Carbon reduction

There is an urgent need to optimise redevelopment to significantly reduce the carbon footprint of the process without compromising the requirement for delivering a safe and suitable use of the site. With that in mind, LEAP has worked in partnership with the University of Surrey to develop a series of carbon reduction design tools (CReDiT). These provide information on the embodied carbon cost of its report recommendations and encourage the conversation about carbon at an early stage in the design process.

Consideration has been taken throughout the report to align the recommendations with climate protection, circular economy and sustainable materials.

LEAP recognises the unique position that it occupies at the very beginning of development projects and the value of informing clients on the carbon cost of design recommendations. As such, headline information from the CReDiT tools are provided in site investigation reports without additional cost

[3] Environment Agency. Land Contamination Risk Management (LCRM),. **https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm**

[4] BS EN 1997 Eurocode 7- Geotechnical Design- Part 2: Ground Investigation and Testing (2007)

to the client. This is being done to engage furthermore detailed consultation where the full range of LEAP's sustainability capabilities can be deployed.

1.5.2 Potential for ground source heating and cooling

Most locations in the UK are suitable for the installation of ground source heating or cooling (GSHC) systems. The most appropriate type of installation is determined by the available space, heating and cooling demands of the proposed development and a number of geological and hydrogeological factors, and drilling risks (amongst other factors). LEAP can appraise these site-specific conditions through a desk-based feasibility study to assist in determining the viability of this sustainable source of heating/cooling energy at the site, should this be of interest to you. We also have in-house capability to undertake field assessments including soil thermal conductivity surveys and soil thermal response test (TRT), as well as the design and installation of GSHC systems.

1.6 Limitations

This report is subject to the RSK service constraints given in **Appendix A** and limitations that may be described below and throughout this document.

This report was prepared in accordance with good practice guidance at the time of issue. Consideration should be considered in the light of changes in legislation, statutory requirements, or industry practices subsequent to the date of issue.

The opinions expressed in this report, and the comments and recommendations given, are based on the information from the current investigation and the previous desk assessment and the site reconnaissance survey carried out by LEAP.

The study aims to principally identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

Although asbestos may not have been encountered as part of these works, asbestos could be present in soil in discrete areas and may be encountered in future ground investigation.

A detailed survey of invasive plant species is outside the scope of this investigation therefore detailed comments with regards to such species have been omitted from this report.

In particular, it should be noted that there may be areas of made ground and potential contamination not detected due to the limited nature of the investigations or the thickness and quality of made ground and concentrations of contamination across the site may be variable. In addition, groundwater levels and groundwater concentrations may vary from those reported due to seasonal, or other, effects.

2 PHASE I – DESK STUDY

A Phase I desk study report was produced by LEAP Environmental and describes the environmental setting, site usage, a preliminary conceptual site model, and a preliminary geotechnical risk assessment. The following section summarises the information from this report along with further information obtained as set out in Section 1.4.1.

2.1 Environmental setting

2.1.1 Site location and description

The site is located to the west of Wooddale Lane, Billingshurst RH14 9DA as shown in Drawing No. 11101, **Appendix B**.

The approximate National Grid Reference of the site is 509710,126150. The site lies at an estimated elevation of 38m Above Ordnance Datum (mAOD).

To facilitate the preparation of the Phase I Desk Study & Site Reconnaissance Report, LEAP attended the site on 23 October 2020 as part of the reconnaissance. A summary of the report findings are presented in **Table 1** below:

Table 1: Summary of LP2373 Phase I Desk Study

Desk study environmental setting	
Site history	The site and the surrounding area have remained undeveloped since the earliest maps in 1876, and the configuration of the fields is similar to that seen during the site walkover and from online aerial mapping. The field immediately adjacent to the site to the southeast was shown as woods sometime between 1911 and 1963 and the trees were removed sometime in the last 20 years. No evidence of forestry or remaining trees were encountered during the site walkover. A 1960's landfill neighbours the site's southeastern boundary and was recorded as receiving inert, commercial and household wastes. An above ground water company reservoir was constructed 75.00 m to the southeast of the site at the beginning of the 20th century and remained present until sometime between the 1970s and 1990s when it was redeveloped as a residential plot.
Geology	Superficial No superficial deposits mapped onsite Bedrock Weald Clay Formation – Mudstone Weald Clay Formation - Sandstone (Only mapped within the northeastern corner of the site)
Hydrogeology & Hydrology	Groundwater Weald Clay Formation – Mudstone: Unproductive Strata Weald Clay Formation – Sandstone: Secondary A Aquifer

	<u>Surface Water</u> River Adur: 340 m to the southeast of the site
Flooding	The site is not situated within a flood zone or mapped at risk of groundwater flooding.
Sensitive Land uses	The Envirocheck report details two areas of ancient woodland located within 500 m of the site, to the northeast. The closest is 176 m from the site.
Mining / ground working	No current or historical ground workings are reported within 500 m of the site, except the 1960s landfill which neighbours the site on the southeastern boundary.
Natural Cavities	The site is not situated within an area affected by coal or non-coal mining and no natural cavities within 1000 m of the site boundary reported.
UXO	Low risk
Walkover observations: October 2020	
Site use	The site comprised three grassed field parcels, and there is evidence these may have been used as a camp site.
Evidence of Onsite contamination	A walkover survey was carried out on 23 October 2020. There was no visible evidence to imply widespread sources of historical contamination on site, although the presence of old machinery suggests the fields may have been used for agricultural purposes in the past. Localised evidence of fly-tipping and camping were encountered at the access and centre of the eastern parcel of the site. Although no large structures were encountered, one sheet of potential asbestos containing corrugated cement sheeting was found within the fly tipping area. No above or below ground fuel storage tanks were encountered on-site. A manhole chamber containing a pipe indicative of a water supply pipe was found by the access of the site.
Neighbouring land use	The following features were identified as possible sources of contamination: • Vehicular activity / fly tipping along Wooddale Lane, east of the site • Potential logging activity to the southeast of the site
Preliminary Conceptual Site Model (CSM)	
Sources: Onsite	The following features were identified as possible sources of onsite contamination in the CSM: • Historic agricultural use: Hydrocarbons, heavy metals, pesticides, herbicides • Fly tipping waste including possible asbestos containing cement corrugated sheet • Onsite wastes: heavy metals, hydrocarbons, VOCs
Sources: Offsite	The following features were identified as possible sources of offsite contamination in the CSM: • Historic landfill: land gases, , PAH, hydrocarbons • Fly tipping along Wooddale Lane: heavy metals, asbestos • Potential historic forestry/logging: hydrocarbons, heavy metals
Receptors	<u>Human Health</u> • Future onsite residents and neighbouring residents

	• Construction workers <u>Controlled Waters</u> • Weald Clay Formation – Sandstone: Secondary A Aquifer <u>Other</u> • Material construction of buildings and infrastructure
Pathways	The development will involve private gardens and public open space, so all linkages involving resident humans and soil contaminants will be active. The small mapped outcrop of sandstone in the northeast provides a potential pathway for soil contaminants to enter groundwater.
Conclusion	The risk of contamination from pesticides to future end users and construction workers is considered to be a low risk, given the potential historical use of the site for agricultural purposes. Contamination from petroleum hydrocarbons associated with vehicle movements across the site is assessed as low risk, as concentrations of hydrocarbons will be small and localised if present. Due to the presence of the suspected ACM sheet panel, there is possibility of asbestos being encountered elsewhere on site, resulting in the current risk of asbestos to be classed as low to moderate. The risk to the groundwater resource from the potential sources of contamination identified on site is considered very low as the majority of the site is underlain by low permeability clays. In addition, the potential sources identified on site are mainly pesticides and other contamination is likely to be of minor extent and localised. The area off-site historically landfilled in the 1960s, immediately adjacent to the south-east of the site, may be a source of contaminants and land gases. As such there is possibility of land gas being present at the site and the risk is classed as moderate at this stage due to the proximity. The underlying Weald Clay Formation mudstone is likely to be relatively impermeable and will significantly reduce the potential for contamination to migrate on to the site. Therefore, the risk for onsite contamination from off site sources is considered to be low.
Geotechnical risk assessment	
Shrinkable soils	Substantial risk: Clay is generally Medium to High Volume Change Potential and therefore foundations will likely require deepening near trees.
Aggressive ground conditions to concrete	Substantial risk: The Weald Clay Formation mapped beneath the site can contain pyrite (high sulphate content), which can lead to aggressive conditions which could adversely affect any subsurface concrete.
Land filling	Low to moderate risk: The records found on the historical landfill, mapped to the south east of the site boundary, list accepted wastes including industrial, commercial and household type wastes.
Slope Stability	Substantial risk: The separate land parcels of the site were observed to comprise relatively gently sloping ground. It is noted that shear surfaces within

	the clay soils have been observed on the adjacent construction site. Further assessment of slope stability is recommended, initially with a review of the site topographic survey and proposed site layout.

3 PHASE II - INTRUSIVE INVESTIGATION

3.1 Investigation rationale

The main purpose of the site investigation was to collect preliminary geo-environmental and geotechnical information to support the residential redevelopment of the site. To achieve the investigation rationale, the scope of works comprised a total of 26 investigation locations across the site, including: 20 machine excavated trial pits to a maximum depth of around 3.00 m bgl, and 6 windowless sampler boreholes to a maximum depth of 5.00 m, with 6 ground gas monitoring installations to 3.00 m bgl.

The scope of the investigation was non-targeted to give general coverage and, in accordance with BS10175, took into consideration the proposed development plans and the preliminary geoenvironmental and geotechnical risk assessments that were developed in Section 2.

The spacing of the investigation locations was consistent with the recommended density of 25.00 to 50.00 m for an exploratory investigation, after BS10175 Section 7.7. Investigation locations were spread evenly across the site to provide non-targeted coverage roughly placed on a herringbone grid where access allowed.

Due to the potential for presence of ground gases, monitoring wells were installed in all windowless boreholes and were located in general accordance with the requirements given in BS8576:2013[5]. Four of the six monitoring wells were located close to the adjacent landfill to the southeast.

The site investigation locations are illustrated in Drawing No. 11301, **Appendix B** and **Table 2** provides a summary of the rationale, proposed scope and what was achieved in the field:

Table 2: Rationale and scope for investigation locations

Trial Hole/Test Location	Rationale	Proposed Depth (m bgl)	Achieved Depth (m bgl)	Additional Comments
WS1 – WS6	Provide information on ground conditions, with in-situ testing completed to aid bearing capacity recommendations. Install gas and groundwater monitoring wells. Investigate potential soil contamination.	5.00	2.00 – 4.00	it was not possible to reach the proposed depth of 5.00 m in any of the locations due to refusals within the mudstone of the Weald Clay Formation.
TP1 – TP2, TP6 – TP9, TP11 – TP20	Provide information on ground conditions.	3.00	2.20 – 3.00	All trial pits were excavated to 3.00 m except TP14 which terminated at 2.20 m due

[5] BS8576:2013 Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)

Trial Hole/Test Location	Rationale	Proposed Depth (m bgl)	Achieved Depth (m bgl)	Additional Comments
	Provide information on the shallow ground conditions and to examine near surface soils for slip surfaces, with in-situ testing completed to aid bearing capacity recommendations.			to mudstone preventing further excavation. TP3, TP4, TP5, and TP10 were not completed. This was agreed with the Client onsite due to time constraints and there being no proposed residential development in this region of the site.

3.2 Site work

3.2.1 Date and weather conditions

The intrusive investigations were undertaken between 11 and 12 February 2025. At the time of the investigations, the weather was partly sunny and cool, with light frosts overnight.

Met office climate summaries indicate that December 2024 was slightly warmer and drier, with only 50 - 75% of long-term average 1991-2020 rainfall. January 2025 was slightly cooler than the 1991-2020 long term average, with the south east receiving 125 - 150% more rainfall over the month. February 2025 showed little to no deviation from the anticipated values for temperature and rainfall.

3.2.2 Site work methods

3.2.2.1 Windowless sampler

The windowless sampling rig consists of a tracked barrow with a sampling unit mounted on the top. When in the required position, the mast was raised to a height allowing a mechanised drop weight to fall repeatedly onto an anvil, and drive attached sample tubes or probe rods into the ground to produce reasonably intact continuous samples which were then extracted using the integrated hydraulic ram.

To reduce any tendency of the tubes to stick in the ground, a succession of smaller diameters may be used to obtain full depth. Excavated soils were placed aside for inspection and sampling.

On completion, the boreholes were installed with monitoring well pipework and surrounding shingle around slotted pipe and impermeable bentonite around the shallow plan pipe to act as a seal. The installs were completed with a cemented raised steel cover.

3.2.2.2 Trial pitting

Trial pits were excavated by a backhoe excavator. The trial pits had a target depth of 3.00 m bgl and were typically 0.45 m wide by 2.00 m long. Trial pit dimensions are shown on the trial pit logs, included as **Appendix D**. Excavated soil was heaped next to the pits to be logged and sampled,

and were then replaced in reverse order. The pits were compacted on backfill and left slightly mounded to allow for future settlement.

3.2.2.3 Soil logging and sampling

Soil samples were recovered from the boreholes and trial pits for field screening, logging and sampling.

Soils were logged in general accordance with the requirements of BS 5930:[6] and BS EN ISO 14688[7]. Borehole and trial pit logs are presented in **Appendix D**.

Visual and olfactory evidence of contamination was noted if encountered. These observations were used to aid scheduling of samples for chemical laboratory analyses and are included on the logs in **Appendix D** and summarised in Section 3.1.1.2.

Samples were collected by hand using dedicated nitrile gloves for each sampling location. Samples were placed into laboratory supplied sampling containers, specific to the type of analyses required.

All sample containers were sealed and labelled with a unique location identity, depth and date of sampling.

3.2.3 Sampling and field tests

3.2.3.1 Soil sampling

Geoenvironmental soil samples were selected to ensure that near-surface exposure of human health via direct contact was targeted, as well as to spatially and vertically delineate possible sources of contamination.

Geotechnical soil samples were targeted to characterise the geological sequence, and to obtain characteristic soils properties and specific geotechnical design parameters as per the proposed development.

3.2.3.2 Standard penetration tests (SPT)

Standard Penetration Tests (SPT) were undertaken in WS1 – WS6. The tests were undertaken at 1m centres and were carried out in accordance with BS EN ISO 22476-3;2005. Uncorrected blow counts, 'N values', are recorded on windowless borehole logs in **Appendix D**.

3.2.3.3 Field vane test

In-situ field vane tests were undertaken in cohesive soils in the trial pits in accordance with BS EN ISO 22476-9. The results are recorded on the trial pits logs in **Appendix D**.

3.2.4 Ground gas and groundwater monitoring

The 6 monitoring wells were installed within windowless sampler boreholes during the intrusive works, WS1 – WS6. The monitoring wells were constructed of 50.00 mm diameter HDPE pipe. The

[6] BS5930:2015+A1:2020 Code of Practice for Ground Investigation

[7] BS EN ISO 14688 Parts 1-2 (2018) Geotechnical Investigation and Testing. Identification and classification of soil

response zone of the installed wells was targeted at shallow depths where gas migration may occur and was surrounded by washed filter gravel. The plain zone was surrounded with bentonite to provide a seal. The monitoring wells were finished with bungs with gas taps and raised steel covers. Monitoring well installations are shown on the borehole logs in **Appendix D** and are summarised in **Table 3** below.

Table 3: Borehole installation details

Borehole	Targeted Medium	Installed Depth (m bgl)	Response Zone (m bgl)	Bentonite Seal (m bgl)	Targeted Stratum
WS1	Ground gas	3.60	1.00 - 3.60	0.00 – 1.00	Weald Clay Formation – Mudstone
WS2	Ground gas	3.00	1.00 – 3.00	0.00 – 1.00	Weald Clay Formation – Mudstone
WS3	Ground gas	2.00	1.00 – 2.00	0.00 – 1.00	Weald Clay Formation – Mudstone
WS4	Ground gas	4.00	1.00 – 4.00	0.00 – 1.00	Weald Clay Formation – Mudstone
WS5	Ground gas	3.00	1.00 – 3.00	0.00 – 1.00	Weald Clay Formation – Mudstone
WS6	Ground gas	3.00	1.00 – 3.00	0.00 – 1.00	Weald Clay Formation – Mudstone

3.2.4.1 Ground gas monitoring

The ground gas investigation strategy was designed generally in accordance with BS8576:2013[8].

The placement of gas monitoring wells was considered to provide a general coverage, however, targeted the areas of the site where there is proposed development (western two fields of the site).

The CSM highlighted the historical landfill as a potential ground gas generating source to the proposed new residential properties. Therefore, four of the six monitoring wells were located close to the adjacent landfill to the southeast.

Weekly monitoring was carried out based on the following:

- Source: Adjacent historical landfill dating from 1960's with gas generation potential.
- Pathway: Granular Weald Clay Formation – Sandstone, acting as a plausible ground gas migration pathway.

[8] BS8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds ()

- Receptor: Residential properties with private gardens being considered a high sensitivity receptor.

3 rounds of ground gas monitoring were undertaken during this investigation. The visits were completed on the 26 February, the 4 March, and the 13 March 2025. The wells were monitored for methane, carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide using a GFM 436 portable gas analyser. The wells were monitored for Volatile Organic Compounds (VOCs) using a PhoCheck+ portable Photo-Ionisation Detector (PID). The full monitoring results are provided in **Appendix D**.

3.2.5 Laboratory analysis

3.2.5.1 Geotechnical laboratory testing

Selected samples of the soils have been classified by laboratory analysis for geotechnical design purposes. The laboratory testing has been carried out by K4 Soils Laboratory at its laboratories in Watford, in accordance with BS13779 and BS EN ISO1789210. The sampling technique, type, storage and transport and the number of laboratory tests have been undertaken where possible in accordance with BS EN 1997-2:2007 and BS EN ISO 2247511.

The following laboratory tests have been undertaken:

Table 4: Geotechnical laboratory testing

Test	Number of tests	
	Weald Clay Formation – Clay	Weald Clay Formation – Mudstone
Moisture Content	8	2
Atterberg Limit Test	8	2
pH	5	1
Sulphate Soluble (2:1)	3	0
BRE SD1 Suite B	2	1

The geotechnical laboratory test results are provided in **Appendix F**.

[9] BS1377 Parts 1-9:1990 Methods of test for Soils for Civil Engineering Purposes

[10] BS EN ISO 17892 Parts 1-12 Geotechnical Investigation and Testing. Laboratory testing of soil

[11] BS EN ISO 22475 Parts1-3 Geotechnical Investigation and Testing. Sampling methods and groundwater measurements

3.2.5.2 *Chemical soil analysis*

Selected samples of soil were subjected to laboratory testing.

The suite of soil contaminant analysis took into account the potential contaminants of concern identified in the CSM, which included: heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), asbestos, petroleum hydrocarbons, Semi-Volatile Organic Compounds (SVOCs), VOCs, pesticides, and Polychlorinated biphenyls (PCBs). Soil samples were also analysed for pH and total organic carbon (TOC) to support the selection of assessment criteria in the subsequent quantitative risk assessment (QRA) for human health.

The laboratory testing also included selected samples for waste classification purposes to support the developer with future materials management options.

Sampling techniques and storage have been undertaken as per BS 10175:2011+A1:2013 Code of Practice for Investigation of Potentially Contaminated Sites. The laboratory testing was carried out by Chemtech Environmental, at their facilities near Newcastle. Where available, the tests for soils procedures were UKAS and MCERTS accredited.

The following analyses were completed on selected soil samples based on field observations and for general vertical and lateral coverage:

- 8 Metals (As, Cd, Cr, Cr VI, Cu, Pb, Hg, Ni, Se, Zn)
- 8 USEPA 16 PAHs
- 8 Asbestos identification
- 8 Semi-volatile organic compounds (SVOCs)
- 8 pH
- 8 TOC
- 2 Petroleum hydrocarbons (TPH CWG method) with BTEX
- 6 Organochlorine pesticides, organophosphorus pesticides, triazine herbicides suites.
- 2 Waste Acceptance Criteria (WAC) tests

The laboratory test results are summarised in Section 6.2 and **Appendix G**, and the laboratory analytical certificates are provided in **Appendix H**.

3.2.6 Constraints to the scope

Very wet and soft ground conditions meant that siteworks were slowed by movement. Therefore, it was agreed with the client, while onsite, to reduce the scope (number of intrusive positions) in the northeast field, which is only proposed for soft landscaping and there is no proposed residential development.

3.3 Ground conditions

The ground conditions are described in detail in the logs attached in **Appendix D**. In summary the soil conditions were as follows:

Table 5: Summary of soils encountered

Depth From (m)	Depth To (m)	Soil Type	Description
0.00	0.10 / 0.30	**TOPSOIL**	Grass over dark brown silty CLAY with occasional rootlets (TOPSOIL).
0.20 / 0.30	0.50 / 3.00	**CLAY**	Firm to very stiff orangish brown to reddish brown silty CLAY with occasional selenite crystals (WEALD CLAY FORMATION).
0.50 / 2.60	3.00 / 4.00	**MUDSTONE**	Very weak to extremely weak grey MUDSTONE with occasional selenite crystals. Recovered as a silty gravel. Gravel is fine to coarse, angular mudstone (WEALD CLAY FORMATION).

The ground conditions onsite, based on all the intrusive locations carried out to date, generally consist of topsoil, comprising silty clay, to a maximum depth of 0.30 m bgl, over firm to very stiff silty clay of the Weald Clay Formation to a maximum depth of 2.60 m bgl, over mudstone of the Weald Clay Formation, to the maximum extent of the investigation, 4.00 m bgl. No made ground was identified onsite during the intrusive investigation.

Topsoil was identified in every intrusive position onsite, and its composition did not vary spatially across the site. No anthropogenic inclusions were noted within any of the topsoil onsite, and the thickness of the topsoil ranged from 0.10 to 0.30 m.

The online BGS viewer map indicates that an outcrop of Weald Clay Formation - Sandstone is present in the northeastern portion of the site, however within the intrusive locations in this region of the site: TP9, TP13 and WS3, no sand or sandstone was encountered. It should be noted that sand was only encountered in TP7, which is in the western half of the site. It was recorded from 1.80 – 2.20 m bgl and comprised reddish brown mottled orange and grey clayey SAND.

Across the entire site, underlying the topsoil, silty clays were identified, associated with the Weald Clay Formation. The clays encountered were firm to very stiff, increasing in stiffness with depth. Beneath the silty clays was a gradual transition to extremely weak mudstone of the Weald Clay Formation, which was identified to the maximum extent of the investigation, 4.00 m bgl. Occasional potential selenite crystals were identified within both the clay and the mudstone. The mudstone was generally encountered between 2.20 to 2.60 m bgl, however in one location the mudstone is much shallower, TP14, where it is encountered at 0.50 m bgl. Mudstone was encountered in all the intrusive locations except WS2 and TP1, both in the northern region of the site, where silty clay was encountered to the base of the excavation.

A number of trial holes did not reach their desired depth due to refusals within very stiff clay or weak mudstone. There appears to be no general distribution regarding the areas of the site where refusals occurred and where refusals did not. TP14 was terminated at 2.20m bgl, WS1 refused at 3.60 m, WS2 refused at 3.00 m, WS3 refused at 2.00 m, WS5 refused at 2.00 m, and WS6 refused at 3.00 m bgl. Refusals occurred between 2.00 – 3.60 m bgl, which roughly correlates with the recorded boundary between the clay and the underlying mudstone of the Weald Clay Formation.

No geotechnical indicators of concern were noted within the Weald Clay Formation, for example shear surfaces or desiccation. However, the selenite identified indicates the Weald Clay Formation may be aggressive to concrete.

3.3.1.1 Groundwater

No groundwater strikes were recorded within any of the trial holes. However, within some of the trial pits seepage was recorded as a result of surface water falling in from surface and seeping through topsoil in places. Groundwater monitoring results of the installed monitoring wells are summarised as follows:

Table 6: Groundwater monitoring results

Monitoring well	Groundwater level m bgl			
	20/02/2025	26/02/2025	04/03/2025	13/03/2025
WS1	2.64	2.48	2.40	2.30
WS2	0.60	0.62	0.60	0.62
WS3	Dry	Dry	Dry	Dry
WS4	Dry	Dry	Dry	Dry
WS5	Dry	Dry	Dry	Dry
WS6	Dry	Dry	Dry	Dry

The groundwater level was recorded during the gas monitoring visits, full monitoring results are provided in **Appendix E**. The Met Office climate summaries in Section 3.2.1, indicate that in January the southeast of England received above average rainfall, and therefore this will impact the groundwater monitoring results.

3.3.1.2 Visual and olfactory evidence of contamination

No visual or olfactory evidence of contamination was encountered during the intrusive investigation or subsequent gas monitoring visits. Furthermore, no made ground was encountered during the site investigation.

4 GEOTECHNICAL INFORMATION

4.1 Strata encountered

4.1.1 Weald Clay Formation - Clay

The topsoil onsite was underlain by firm to very stiff plastic clays to a maximum depth of 3.00 m bgl. The results of the geotechnical laboratory testing are summarised in **Table 7** below.

Table 7: Summary of geotechnical test results for Weald Clay Formation - Clay

Test	Range
Standard Penetrometer Test (SPT) Uncorrected 'N value' (SPT values have been limited to an N value of 50)	8 – 50
Standard Penetrometer Test (SPT) 'N_{60} value' (Hammer energy ratio 60%)	8 – 50
Shear Strength (Hand Vane) (kPa)	63 – 88
Moisture Content (%)	15.4 – 25.7
Liquid Limit (%)	33 – 58
Plastic Limit (%)	15 – 24
Plasticity Index (%)	18 – 34
Water Soluble Sulphate (g/l)	0.082 – 2.14
Acid Soluble Sulphate (SO4) (%)	0.03 – 1.95
Sulphur (%)	0.0217 – 0.834
pH	7.8 – 8.4

The results from the Atterberg limit testing indicate that the Weald Clay Formation clay is comprised of low to high plasticity clays. This is illustrated by an Atterberg plot, included as Figure 1, **Appendix B.**

Furthermore, the Standard Penetrometer Test (SPT) values indicate that the clay of the Weald Clay Formation is stiff to very stiff, and increases in stiffness with depth. This is illustrated by the SPT vs depth plot is included as Figure 2, **Appendix B**.

4.1.2 Weald Clay Formation - Mudstone

The clay of the Weald Clay Formation was underlain by extremely weak mudstone of the Weald Clay Formation to the extent of the investigation, to 4.00 m bgl. The results of the geotechnical laboratory testing are summarised in **Table 8** below.

Table 8: Summary of geotechnical test results for Weald Clay Formation – Mudstone

Test	Range
Standard Penetrometer Test (SPT) Uncorrected 'N value' (SPT values have been limited to an N value of 50)	21 – 50
Standard Penetrometer Test (SPT) 'N_{60} value' (Hammer energy ratio 60%)	21 - 50

Test	Range
Moisture Content (%)	17.8 - 20.3
Liquid Limit (%)	40 – 44
Plastic Limit (%)	22
Plasticity Index (%)	18 – 22
Water Soluble Sulphate (g/l)	0.914
Acid Soluble Sulphate (SO4) (%)	0.15
Sulphur (%)	0.0547
pH	9.1

The Standard Penetrometer Test (SPT) values indicate that the mudstone of the Weald Clay Formation is extremely weak rock.

5 GEOTECHNICAL APPRAISAL

5.1 Geotechnical design

The foregoing geotechnical appraisal does not constitute a Geotechnical Design Report in accordance with BSEN1997. The following recommendations are for preliminary design purposes only.

For the detailed design, the short-term and long-term design situations must be considered. Where relevant, the following limit states should be considered:

- Loss of equilibrium of the structure or the ground, considered as a rigid body, in which the strengths of structural material and the ground are significant in providing resistance (EQU)
- Internal failure or excessive deformation of the structure or structural elements in which the strength of structural materials is significant in providing resistance (STR)
- Failure or excessive deformation of the ground, in which the strength of soil or rock is significant in providing resistance (GEO)
- Loss of equilibrium of the structure or the ground due to uplift by water pressure or other vertical actions (UPL)
- Hydraulic heave, internal erosion and piping in the ground caused by hydraulic gradients (HYD).

The following factors should also be considered:

- Overall stability and ground movements
- Nature and size of the proposed construction including the design life
- Conditions with regards to the surroundings (e.g. neighbouring structures, traffic, utilities, vegetation, contamination etc.)
- Ground and groundwater conditions
- Influence of the environment.

5.2 Geotechnical appraisal

5.2.1 Swelling and shrinkage

Based on the laboratory test results in Section 4.0, an overall classification of NHBC **HIGH** Volume Change Potential (VCP) is recommended for the clay soils.

Foundations will therefore require deepening in accordance with NHBC Chapter 4.2 where clay soils are encountered near trees. Foundation depths should be calculated based on the mature height of the tree; however, the existing height is relevant for trees which are to be removed. Deepening may be terminated where the mudstone is encountered at depth.

The BGS GeoClimate study (UKCP18)[12] indicates the potential change in subsidence due to changes in climate. The results project a 6.5% of properties will be affected by swelling and shrinkage by 2030, rising to 11% by 2070 (compared to 3% in 2020). For homes in the Billinghurst area, it is improbable that they will be affected by climate change shrink swell in 2030, however, this is risk is rated possible in 2080 climate predictions.

5.2.2 Sulphates

3 samples of the Weald Clay Formation were tested for water soluble sulphate content pH, water soluble sulphate content, total sulphur, and acid soluble sulphate. In accordance with the BRE[13] methodology and the number of samples tested; the site has been classified on the highest measured sulphate content.

Based on the results detailed in Section and the above, the soils are classified by the BRE as sulphate design class DS-3, and, assuming a static groundwater table, the ACEC class is AC-2s.

5.2.3 Groundwater

Groundwater encountered during the investigation was generally noted as a slight seepage at the boundary between the topsoil and the underlaying Weald Clay Formation is assumed to be related to surface water runoff. Pooled water was present across the site surface following recent rainfall.

The groundwater monitoring results of the installed boreholes are provided in Section 3.3.1.1. On the basis of these results, which show that four out of the six positions were dry, indicates that the groundwater encountered in the other two wells is perched within the low permeability clay soils. Therefore, perched groundwater at about 0.60 to 2.64 m below ground level should be anticipated across the site. Groundwater levels over the remainder of the site are not proven.

Long term groundwater monitoring was beyond the scope of works and would be required to fully assess the groundwater regime.

5.2.4 Soakage potential

Soakage testing was not completed as part of the site investigation. However, soakage potential of Weald Clay Formation (Mudstone) is anticipated to be very poor, due to the predominantly cohesive makeup of the geological formation. Additionally, the mapped sandstone in the northeast of the site was not encountered during the site investigation. At this stage, the site is not considered suitable for conventional soakaways, and allowance should be made for surface water to be piped off site at this stage.

[12] https://www.bgs.ac.uk/news/maps-show-the-real-threat-of-climate-related-subsidence-to-british-homes-and-properties/

[13] Building Research Establishment Special Digest 1: 2005. Concrete in aggressive ground. Part 1: Assessing the aggressive chemical environment.

5.2.5 Bearing capacity and foundations

5.2.5.1 Shallow foundations

Allowable Bearing Capacity or Pressure is a conservative estimate of the ultimate bearing resistance of the ground, selected on the basis of the soil/rock description, and taking a presumed degree of settlement into account. It has traditionally been used to check simple foundation designs. The use of this method is acceptable under BS EN 1997-1[14] as a "prescriptive method", with the allowable bearing pressures now termed "presumed bearing resistance".

The presumed bearing resistance is highly dependent on proposed depth of foundation, width of foundation and the structure's tolerance for settlement. The following section provides a preliminary presumed bearing resistance assuming a stated depth and width of foundation and assumes that settlements of up to 25.00 mm can be tolerated by the structure. Should alternative foundation depths and dimensions be required, or the proposed structure have different long term movement requirements then the following assessment should be re-evaluated.

All loads should be transferred beneath any topsoil, made ground, loose, soft, low strength, desiccated or disturbed soils and transferred onto the firm to very stiff clay or weak mudstone if encountered at 1.00 m depth. On the basis of the findings of the intrusive investigation to date, a preliminary presumed bearing resistance of 100kPa may be assumed for a 600mm wide foundation on the firm to very stiff clays or weak mudstone of the Weald Clay Formation. However, foundations will require deepening in the clay soils near trees to NHBC HIGH VCP precautions to the required depth or where mudstone is encountered.

Further information may be required for the detailed design stage, including the foundation design details and further investigation to meet the requirements of BS EN 1997 and BS 8004[15].

Where foundations are stepped or span different soil types, allowance should be made for nominal reinforcement.

5.2.5.2 Construction supervision

Foundation excavations should be inspected by a suitably qualified engineer prior to pouring concrete to ensure competent soils, in this case the firm to very stiff clays and/or weak mudstones are encountered at formation level.

5.2.5.3 Sustainability considerations for foundations

LEAP's foundation carbon calculator has been used to assess the relative embodied carbon output of the recommended foundation options. The tool considers the intrinsic carbon dioxide generated from the materials which make up the foundation as well as emissions associated with onsite plant, earthworks and the disposal of trench/pile arisings.

[14] BS EN 1997-1(2004)+A1:2013 Eurocode 7:Geotechnical Design: General Rules

[15] BS 8004:2015+A1:2020 Code of Practice for foundations

Based on the limited information available to date on the proposed construction, the carbon calculator indicates that assuming the foundations summarised above are utilised on site then traditional footings would be the less carbon intensive option.

The model also indicates that where traditional foundations are to be extended below 2.20 m bgl then piled foundations are the less carbon intensive foundation option. These results are shown in **Appendix J**.

Further, more detailed calculations and wider sustainability assessments can be provided if required.

5.2.6 Floor slabs

With reference to NHBC Standard 5.2, suspended floor slabs are recommended: -

- Where the depth of fill exceeds 600 mm
- Where foundations are deepened below 1.50 m in accordance with NHBC Standards Chapter 4.2
- Where soils are prone to swelling
- Where desiccated soils are encountered
- Where vibratory ground improvement techniques have been used
- On sloping sites
- Where foundations have been piled.

Suspended floor slabs are therefore recommended on site due to HIGH VCP of the underlying Weald Clay Formation and due to the fact that foundations are proposed within anticipated tree influence zones.

5.2.7 Roads

CBR testing was beyond the scope of works for this investigation. However, as a preliminary guide, LR1132[16] indicates an estimated CBR value for the firm to very still clays of the Weald Clay Formation of 2.5%.

5.2.7.1 Recommendations

Given the anticipated high silt content of the Weald Clay Formation clay, allowance should also be made for a frost susceptible subgrade.

If made ground is encountered at formation level during road construction, over excavation to, say 1m below ground level, proof rolling and then controlled back filling to formation level with a suitable granular fill is recommended.

5.2.8 Excavations

Excavations in the shallow silty clays should be stable in the short term. However, groundwater seepages should be anticipated and perched groundwater levels around 0.60 m bgl should be

[16] TRRL Laboratory Report 1132 The structural design of bitumous roads. Powell, Potter Mayhew and Nunn (1984)

anticipated. Excavations will therefore be unstable in the long term and should be backfilled as soon as possible. Allowance should be made for light pumping.

Appropriate Health and Safety precautions must be adhered to where man entry into excavations is required. Even stiff clay soils at shallow depth can collapse, particularly following wet weather. Alternative foundation methods may need to be adopted where trench footings cannot be safely or satisfactorily constructed.

5.2.9 Filling

The preliminary recommendations contained within this report assume that ground levels are to remain at a similar level across the site for the proposed development, and that no significant changes in level are proposed. In the event that ground levels are to be raised, this may induce significant settlement, particularly across the areas of soft clays, which could adversely affect foundation design, drainage etc. Where significant changes in ground levels are proposed then further investigation will be required to assess the impact of such earthworks on the above recommendations. For residential developments where filling is proposed, further guidance on the technical requirements and recommendations for using engineered fill on the development is given in NHBC Standards Chapter 4.6[17].

5.2.10 Slope stability

The site is sloping gently in opposite locations in the southern field and north-western field, where residential development is proposed. The north-western field slopes downwards towards the south-east, and the southern field slopes towards the north-west. Both fields include a fall of 2.00 m over ~120 m. Whilst the slopes are not considered sufficient to warrant any significant slope stability issues, general recommendations for developing on slopes include the following:

- care must be taken to ensure that any cut and fill operations do not destabilise the slope. As a general principal, loading at the crest and cutting at the toe would have such an effect
- retaining walls should be avoided if possible, kept to a maximum height of 600 mm where necessary, and include adequate drainage. Retaining walls exceeding 600 mm in height should be designed by a suitably qualified engineer
- filling of subfloor voids should be avoided
- drainage of the site will be crucial
- all drains should be laid at twice the normal fall to accommodate any local ground movement
- where houses include partial basements, allowance should be made for the design of the walls as retaining structures
- vegetation will have stabilising effect and should be maintained for as long as possible

[17] NHBC Standards Chapter 4.6 Engineered Fill

- introduction of water into the slope must be avoided. Soakaways should be kept remote from slopes and services at the slope crest should be designed accordingly, with, for example, clay breaks in the surround
- excavations across the slope should be avoided if possible. Where necessary, they should be kept to short lengths, say 5.00 m, and backfilled immediately.

Global stability checks will be required when developing on slopes and allowance should be made for slope stability analyses at the design stage.

Caution should be taken to ensure that your slope design factors in climate resilience. Climate change modelling indicates drier summers and more intense wet weather periods in future.

5.2.11 Retaining walls

It is understood that no retaining walls are proposed on site.

5.2.12 Settlement

Based on the presumed bearing resistance given in Section 5.2.5, settlements should be within typical tolerable limits for the low-rise development proposed.

If soft clays are encountered at formation level or below, significant settlement should be anticipated, and serviceable limit state analyses will be required. For Geotechnical Category 2 and 3 structures, detailed settlement analyses are usually required.

At this stage it is assumed that ground levels will remain at the current level for the proposed development. If significant level raises are proposed, this may induce significant settlement in the natural soils and detailed settlement analyses will be required.

Where foundations are stepped or span different soil types, differential settlement should be anticipated, and allowance should be made for nominal reinforcement.

5.2.13 Heave and uplift

In accordance with NHBC Standards Chapter 4.2, precautions against heave should be used where foundations are within the influence of trees and the resulting foundation depth is greater than 1.50 m. Compressible material must be provided against the inside faces of all external wall foundations greater than 1.50 m in depth. For pier and beam foundations, additional voids are required below ring beams.

Heave may also occur where shrinkable soils are unloaded, in say, basement excavations. To avoid uplift pressures, voids or buffer zones should be left beneath floor slabs. As a preliminary guide, allowance should be made for a 300 mm void for highly shrinkable clays, reducing for lower plasticity soils. This should be confirmed at the detailed design stage.

5.3 Geotechnical recommendations

Further assessment including a geotechnical design report will be required once the details of the proposed construction are known.

A preliminary presumed bearing resistance of 100kPa may be assumed for a 600 mm wide foundation on the firm to very stiff clays or weak mudstone of the Weald Clay Formation at around

1.00 m below ground level. However, foundations will require deepening in clay soils located within the zone of influence of trees to NHBC HIGH VCP precautions down to the required depth or where mudstone is encountered.

The Weald Clay Formation soils on site have been classified as sulphate design class DS-3, and assuming a static groundwater table, the ACEC class is AC-2s. As outlined in section 5.2 above, a preliminary carbon calculation indicates that where traditional foundations are to be extended below 2.20 m bgl, in any areas where deep made ground is encountered or where foundations are deepened due to high VCP clays, then piled foundations are the less carbon intensive foundation option.

The site is sloping gently in both of the fields where development is proposed. Recommendations for developing on slopes have been provided.

Due to the high VCP clays encountered at shallow depth across the site, deep rotary boreholes are recommended to aid piled foundation design, targeting areas of the site where foundations are proposed near mature trees around the boundary of the site.

Further investigation is recommended in order to confirm an appropriate CBR value and assess the soakage potential of the shallow clays of the Weald Clay Formation onsite, to confirm if the site is suitable for conventional soakaways.

Further calculations and wider sustainability assessments can be provided if required.

6 GEO-ENVIRONMENTAL QUANTITATIVE RISK ASSESSMENT

6.1 Revised conceptual site model

6.1.1 Introduction

The preliminary conceptual site model presented in Section 2 identified a limited number of plausible contaminant linkages. The intrusive investigation did not find any made ground, or visual or olfactory evidence of contamination.

However, contamination associated with the site's former use as agricultural land with evidence of material/waste storage, including heavy metals, asbestos, hydrocarbons, PAHs, SVOCs and pesticides, are still considered plausible at this stage. The risk to human health was classified as low to very low, the risk to controlled waters was considered very low, however the risk of ground gas generation was considered moderate, due to the fact that the site was neighboured to the southeast by a 1960s landfill for inert, commercial and household wastes. Due to the predominantly cohesive underlying Weald Clay Formation - Mudstone, migration of ground gases is anticipated to be limited. Although the Weald Clay Formation – Sandstone would present a preferential pathway.

Following completion of the preliminary site investigation no revisions to the CSM are considered necessary before carrying out the generic quantitative risk assessment (GQRA). Therefore, based on the findings of the intrusive investigation works, the following potential contaminant linkages are considered relevant:

- Future residents: all pathways from soil exposure and land gasses are active
- Construction workers: all pathways except edible plants are active

6.2 Human health risk assessment

6.2.1 Rationale and approach

The generic quantitative risk assessment (GQRA) for human health was conducted in line with the CLEA methodology by comparing the soil analytical results from the ground investigation with Generic Assessment Criteria (GAC). The GACs were selected using the rationale and assumptions provided in **Appendix I**.

Sets of soil GACs are available for SOMs of 1%, 2.5% and 6%. Using the conversion of SOM = TOC x 1.72.

Table 9: Total organic carbon and soil organic matter ranges for soil populations

Population	No. of Samples	TOC Range (%)	SOM Range (%)
Topsoil	7	0.61 – 4.18	1.05 – 7.19
Weald Clay Formation	1	0.28	0.48

As a conservative approach and given the number of samples tested, GACs have been selected based on 1% SOM for both the topsoil and Weald Clay Formation soil populations.

For some contaminants of concern, direct contact will be the dominant pathway for exposure. In order to support with development options, human exposure to all unsaturated soils, irrespective of depth, has been considered for the purpose of this assessment. This will maximise the information available to the design team on the suitability of all unsaturated material and can support with their materials management options.

The risk assessment did not include statistical analysis. CL: AIRE 2020[18] provides guidance on the appropriate sample sizes for particular statistical distributions of data and non-targeted soil sampling approaches. The number of soil samples collected in the site investigation indicates that statistics are not appropriate to use in this case.

The focus of the GQRA was chronic risks to human health because these often occur at lower doses than acute responses to exposure. Groundworkers during construction and future maintenance may be exposed to unacceptable levels of contamination. The CLEA assessment approach is designed to evaluate long term chronic exposure to contaminants and therefore, this approach is not appropriate for groundworkers who will be exposed for short durations on a site. As such, a GQRA was not undertaken to evaluate the potential for unacceptable exposure to groundworkers and future maintenance workers. A qualitative evaluation is however, provided in previous discussions.

Future residents/site users were determined in the revised CSM to be at potential risk from ground gases (carbon dioxide and methane). The quantitative assessment of these risks is provided as part of the wider evaluation of ground gases in Section 6.3.

6.2.2 Evaluation of potential risks to future residents

The soils that were analysed comprised 7 samples of topsoil and 1 sample of the Weald Clay Formation. The laboratory analytical results were assessed to determine the potential risks to future site users under a generic residential land use scenario assuming that homegrown produce is consumed (Resi-HGP). The quantitative risk assessment is provided in **Appendix G,** and the laboratory certificates are provided in **Appendix H**. A summary table is provided in **Table 10** below. Determinands of pesticides, herbicides, and PCBs where all sample results were below the limit of detection have not been included within the table.

Table 10: Summary of soil contamination test results

Determinand	Number of samples	Number >LOD	Maximum Conc. (mg/kg unless otherwise stated)	Generic Assessment Criteria (mg/kg)	Number of Exceedances
METALS					

[18] CL;AIRE, 2020 'Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration.' CL:AIRE, Buckinghamshire. ISBN 978-1-905046-35-5.

Determinand	Number of samples	Number >LOD	Maximum Conc. (mg/kg unless otherwise stated)	Generic Assessment Criteria (mg/kg)	Number of Exceedances
Arsenic	8	8	20.5	37	0
Cadmium	8	0	<1.6	22	0
Chromium	8	8	42	910	0
Hexavalent Chromium	8	0	<0.04	21	0
Copper	8	8	27.7	2400	0
Lead	8	8	36.6	200	0
Mercury[1]	8	0	<0.7	40	0
Nickel	8	8	32.1	130	0
Selenium	8	0	<3	250	0
Zinc	8	8	67	3700	0
ASBESTOS					
Asbestos	8	0	NAD	Detection	0
HYDROCARBONS					
Benzo(a)pyrene	8	1	0.291	5	0
Naphthalene	8	0	0	5.6	0
Total PAHs	8	1	3.48	n.v.	0
Total petroleum hydrocarbons	2	0	0	11.4	0

Notes to table

1. *Assessment criterion based on methyl mercury*
2. *As n.v. – no appropriate value*
3. *NAD – No asbestos detected*

The chemical results indicate that no metals or hydrocarbons were detected above the selected generic assessment criteria and additionally no asbestos was detected within any of the samples tested. Furthermore, all samples tested for PCBs, total cyanide, pesticides, and herbicides were below the limit of detection.

The ratio of soil contaminant concentrations of genotoxic PAHs (benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(ah)anthracene, indeno(123-cd)pyrene and benzo(ghi)perylene) against benzo(a)pyrene have been compared against lower and upper limits set out in C4SL project methodology (CL:AIRE, 2014). All genotoxic PAH ratios were within the upper and lower bounds of the underlying toxicological study. Therefore, and in accordance with HPA guidance (HPA, 2010), the assessment of genotoxic PAHs has been based on the use of

benzo(a)pyrene as a surrogate marker. Therefore, a risk from genotoxic PAHs is only considered likely if the respective benzo(a)pyrene concentrations exceed the relevant GAC.

6.2.3 Evaluation of potential risks to groundworkers

There is a legal duty for employers to ensure that suitable health and safety controls should be in place to protect groundworkers and they should evaluate the potential for exposure including using data provided in this report which should be included in any future Health and Safety file for the site under The Construction (Design and Management) Regulations 2015.

In this case, employers should consider, amongst others: exposure to loose asbestos fibres, inhalation of vapours and gases in confined spaces such as excavation and dermal exposure to the soils. However, based on the chemical testing of the onsite soils the risk to groundworks is considered to be very low.

6.3 Ground gas risk assessment

6.3.1 Rationale and approach

By way of a preliminary risk assessment, we have adopted the semi-quantitative method outlined in BS8485:2015+A1:2019 (BS8485) using gas situation values (GSVs) to determine the characteristic situation (CS) of the site (or zones of the site) and subsequent protective measures (Wilson and Card approach). This is consistent with current NHBC guidance for very low to moderate risk sites.

Gas concentrations and borehole flow rate are combined to provide hazardous gas flow rate (*Qhg*) for each borehole standpipe and each monitoring event. The *Qhg* is calculated from individual borehole measurements of total gas flow (typically steady state flow) and the maximum concentration of the specific hazardous gas.

To support the assessment a data review is undertaken on the justification / reliability of the flow rates and gas concentrations; whether there are data gaps with respect to the monitoring period; whether there is adequate coverage on the lateral and spatial location of monitoring wells / response zones; consideration of worst-case monitoring conditions; and flooded wells etc.

The *Qhg* derived for methane and carbon dioxide at each borehole are compared to **Table 2** of BS8485. Taking into account the site data (i.e. borehole gas concentration and flow rate to calculate the *Qhg*) and all other influencing factors in accordance with the CSM, a decision is made regarding the GSV that is considered to be representative of the site or a zone within it.

Appropriate design protection measures are recommended in line with BS8485:2015.

6.3.2 Ground gas monitoring results

The gas monitoring results are provided in **Appendix E** and summarised in **Table 11** below:

Table 11: Summary of land gas monitoring results

Monitoring Visit / BH Ref	Maximum Recorded Concentration*						
	CO_2 (%)	CH_4 (%)	CO (%)	O_2 (%)	Steady State Flow rate (Peak) (l/hr)	Atmospheric Pressure (mb)	Was response zone flooded?
Monitoring Visit 1 (26/02/2025)							
WS1	0.0	0.0	0	20.0	0.1 (1.7)	1011	Partially
WS2	0.0	0.0	0	20.0	0.0 (0.1)	1026	Yes
WS3	0.0	0.0	0	20.2	0.0 (0.0)	1012	No
WS4	0.0	0.0	0	20.0	-1.9 (-1.9)	1012	No
WS5	0.0	0.0	0	20.0	0.3 (0.3)	1020	No
WS6	0.0	0.0	0	20.0	0.0 (4.8)	1009	No
Monitoring Visit 2 (04/03/2025)							
WS1	0.4	0.0	0	20.0	0.5 (0.5)	1026	Partially
WS2	0.1	0.0	0	20.0	0.1 (0.1)	1026	Yes
WS3	0.9	0.0	0	20.0	0.0 (0.0)	1027	No
WS4	0.7	0.0	0	20.3	0.4 (0.4)	1028	No
WS5	0.4	0.0	0	20.3	0.0 (0.0)	1027	No
WS6	0.6	0.0	0	20.4	0.6 (0.6)	1025	No
Monitoring Visit 3 (13/03/2025)							
WS1	0.4	0.0	0	17.9	0.0 (0.0)	1000	Partially
WS2	0.2	0.0	0	19.4	-0.5 (-0.5)	1001	Yes
WS3	3.2	0.0	0	8.9	0.0 (0.0)	1002	No
WS4	0.9	0.0	0	15.2	0.0 (0.0)	1000	No
WS5	0.8	0.0	0	18.4	0.0 (0.0)	1000	No
WS6	0.8	0.0	0	14.2	0.0 (0.0)	1001	No

Notes to table values in parentheses are steady state values, with the exception of flow which is reported as steady state; RZ response zone

It was possible to monitor all the boreholes, WS1 – WS6, during each of the three ground gas monitoring visits, which were completed on a weekly basis.

To date, generally low concentrations of carbon dioxide were recorded as below 1%. The only occasion where carbon dioxide exceeded 1% is from borehole WS3, which recorded carbon dioxide concentrations up to 3.2% during the third monitoring visit, when atmospheric pressure was the lowest. No significant sources of carbon dioxide were noted in borehole WS3 during the intrusive works. Additionally, no methane was recorded during any of the three ground gas monitoring visits.

Steady borehole flow rates were generally recorded below 0.7 l/hr, Maximum recorded flow rates generally did not exceed 1.7 l/hr, except WS6 which had a maximum positive flow rate of 4.8 l/hr during the first monitoring visit. Negative flow rates were occasionally recorded within the boreholes, including WS2 and WS4 during the third and first monitoring visits respectively.

In relation to trace gases, no carbon monoxide or hydrogen sulphide have been positively recorded during any of the three ground gas monitoring visits.

6.3.2.1 Data review / sufficiency

LEAP has carried out the recommended number of visits during the course of this investigation. The first ground gas monitoring visit was scheduled for the 20 of February 2025, however, the rainfall on the day prevented the GFM (gas analyser) from functioning correctly, and the only data recorded was the groundwater levels. Therefore, this visit was nullified and recompleted.

All the monitoring wells were screened over the Weald Clay Formation. We note that for borehole WS2 the response zone was flooded during all the monitoring rounds and WS1 was partially flooded, and as such the results may not be representative of ground gases being generated onsite. Additionally, the negative flow encountered in WS2 is considered to be a result of groundwater level changes and not ground gases.

The monitoring rounds were undertaken during a range of atmospheric pressure conditions, ranging from 1000 mb during the third monitoring visit to 1028 mb during the second monitoring visit. To date, none of the monitoring rounds have been undertaken during 'low' atmospheric pressure conditions (<1000 mb). As such, to date, it is considered that the monitoring regime undertaken is not fully representative of the atmospheric pressure conditions that could be encountered, including worst case conditions. However, given the third visit was complete during atmospheric pressures very close to 1000mb, it is considered that the monitoring has taken place within a sufficient range of pressures to provide more confidence in the assessment.

The well spacing is considered representative of the proposed development onsite, with the ground gas monitoring wells located in areas of the site where residential properties are proposed and targeting the landfill to the south-east of the site.

6.3.3 Borehole hazardous gas flow rates

Adopting the methods described above, borehole hazardous gas flow rates (*Qhg*) have been calculated for each borehole standpipe based on the maximum concentrations of ground gases (carbon dioxide and methane) and borehole flow rates recorded **AND** considered representative of the ground gas regime.

As described above, the negative flow rates recorded to date are not considered representative of the ground gas regime onsite, thus have been excluded from the assessment of hazardous gas flow rates. Steady state flow rates have been chosen over peak borehole flow rates as they are considered more representative of the borehole flow rates, with peak flow rates more indicative of fluctuations within the boreholes.

Where maximum concentrations or flow rates are recorded as 0 % or 0 l/hr, the limit of detection of the gas monitoring equipment has been used: 0.1 % or 0.1 l/hr.

Where gas concentrations exceed threshold in **Table 2** of BS8485 these are highlighted in the results table in **Table 12**, below.

Table 12: Maximum hazardous gas flow rates (Qhg)

Borehole No.	Maximum gas concentrations (% v/v)		Maximum Steady State Flow Rate* (l/hr)	Qhg (l/hr)		Characteristic Situation
	CO2	CH4		CO2	CH4	
WS1	0.4	0.0	0.5	0.0020	0.0000	CS1
WS2	0.2	0.0	0.1	0.0002	0.0000	CS1
WS3	3.2	0.0	0.0	0.0000	0.0000	CS1
WS4	0.9	0.0	0.4	0.0036	0.0000	CS1
WS5	0.8	0.0	0.3	0.0024	0.0000	CS1
WS6	0.8	0.0	0.6	0.0048	0.0000	CS1
Key	**CS1 (<0.07) Very Low Risk**		**CS2 (0.07 – 0.7) Low Risk**	**CS3 (0.7 – 3.5) Moderate Risk**	**CS4 (3.5 – 15) Moderate to High Risk**	**CS5 (15 – 70) High Risk**

Based on the available data retrieved to date, and using the most appropriate 'worst case' ground gas concentrations and flow rates, the assessment indicates each borehole is classified as Characteristic Situation 1 (CS1).

6.3.3.1 Worst case check

Monitoring well WS3 installed within the Weald Clay Formation reported maximum hazardous gas concentrations of 3.2% vol carbon dioxide, whilst methane was not detected during any of the monitoring visits (0.0% volume methane), and the maximum recorded steady state flow rate was 0.6 l/hr from borehole WS6.

Using these values a worst case Q_{hg} for carbon dioxide is calculated as 0.0192 l/hr and a worst case Q_{hg} for methane is calculated as 0.0006 l/hr. These results indicate that Characteristic Situation 1 (CS1) is suitable for this site.

6.3.3.2 Total organic carbon

1 sample of the Weald Clay Formation was tested for total organic carbon, from sample WS1 at 0.50 m bgl. The total organic carbon was recorded as 0.28%.

6.3.4 Gas situation value for the site / zone

Based on the guidance and classification system set out in BS8485:2015+A1:2019 a GSV for the site has been concluded as Characteristic Situation 1 (CS1) based on the maximum Q_{hg} calculated for each borehole. In addition, a 'worst case' check undertaken with the maximum Q_{hg} calculated using the maximum gas concentrations and flow rates from each of the boreholes also indicates a classification of CS1.

Therefore, using a multiple lines of evidence approach (as recommended in NHBC guidance) in conjunction with the GSV value, at this stage, the site has been initially determined as Characteristic Situation 1 (CS1) and of very low risk, based on the following:

- Made ground was not found onsite and is not anticipated onsite following the Phase I assessment. Additionally, no other on-site gas generating sources were found during the intrusive investigation.
- The chemical results show that TOC concentration of the Weald Clay Formation onsite is relatively low, below 1%.
- All boreholes were classified as CS1 based on the maximum concentrations of ground gases and maximum steady state borehole flow rates recorded and the 'worst case' assessment.
- Even though none of the monitoring was undertaken during worst-case atmospheric conditions (<1000 mb), the findings of the intrusive investigation have provided evidence that the site is predominantly underlain by clay over mudstone and therefore pathways for ground gases are limited.

Due to the very low risk of ground gases impacting future residents, at this stage no ground gas protection measures are considered to be required to be installed within the proposed residential buildings. If the proposed design for the residential development changes however, a revised assessment may be necessary.

6.4 Limitations and gaps in information

Limited intrusive investigation was carried out in the eastern region of the site, due to the ground conditions during the investigations leading to a reduced scope. Given there is no proposed residential development in this region of the site and instead it is intended to use it as public open space, the reduction of intrusive locations was applied to this part of the site. As a result, it has not been possible to assess the ground conditions as thoroughly and sources may exist which have not been identified. Also, only one borehole was drilled on the eastern half of the site, WS3, and therefore it is considered that the current ground gas risk assessment may not cover any future proposed residential development in this area of the site due to the limited number of boreholes. This is particularly important because the historic 1960s landfill neighboured the site on the southeastern boundary.

6.5 Geo-environmental conclusions

A geo-environmental assessment has been completed based on the intrusive works, monitoring results, and chemical analysis completed during this recent phase investigation and the previous LEAP desk study report. The intrusive investigation works recorded no made ground and no visual or olfactory evidence of contamination.

Chemical analysis of samples of the topsoil and the Weald Clay Formation reported no unacceptable concentrations of contaminants of concern. However, limited soil testing was carried out in the eastern half of the site as currently there is no proposed development in this region, instead it is proposed for public open space. It is therefore considered that no remedial measures will be required as part of the residential development.

No testing was carried out on the groundwater, due to the very low risk identified in the desk study, and no evidence of a source of groundwater contamination was found during this investigation.

Following the three ground gas monitoring visits, the resulting gas risk assessment has identified a CS1 gas risk and therefore the inclusion of gas protection measures are not required within the proposed development.

6.6 Geo-environmental recommendations

Based on the findings of the intrusive investigation, no further geo-environmental investigation or remediation is considered necessary. The findings of this report should be revisited if the development scheme changes significantly, for example if residential development is proposed in the eastern half of the site, to ensure that they remain valid.

6.7 Waste reduction

6.7.1 Soil retention

Soil contains approximately three times as much carbon as the atmosphere. As such minimising its disturbance on site not only minimises the loss of soil for carbon storage but retaining as much soil as possible allows for biodiversity net gain and reduces the risk of surface flooding.

Where possible disturbance of soil functionality during earthworks needs to be minimised. Poorly managed soils that have been compacted in storage will have a degraded physical structure and reduced capacity to maintain above and below ground biodiversity.

The proposed layout indicates areas of public open space. Where possible, excavation from soils in these areas should be limited.

6.7.2 Soil reuse

Prior to development, consideration should be given to any on-site materials and their potential for re-use as part of, or during construction of, the proposed development.

6.7.3 Topsoil re-use

Site-won topsoil is a resource and should, where possible, be treated as such to prevent damage to the soil structure. Where topsoil is to be stripped, stockpiled and re-used such activities should be undertaken during dry weather (generally June to September). Once stockpiled topsoil should

be kept dry. Significant working of topsoil whilst wet can damage the soil structure, reducing the soils' ability to drain and resulting in anaerobic rather than aerobic soil conditions.

Anaerobic soil conditions can have a negative impact on plants and their roots, which will impact the ability of plants to take root once the soil has been placed for its proposed end use. Machinery tracking over recently placed topsoil should be avoided. Should prolonged poor storage result in degradation of the soil some treatment is likely to be required. This may include sand amelioration to improve the soil structure or the addition of composts to reduce nutrient deficiency.

6.8 Waste disposal

Where there is no further reuse options and soils are to be disposed off-site, it is the duty of the waste producer, in this case Bellway Homes Ltd (South London) to ensure that all waste is disposed of appropriately and that any that is sent to landfill is sent to an appropriately licensed one. All waste sent to landfill must be classified and must be pre-treated. There are various forms of pre-treatment that are acceptable.

Further testing and inspection of soils will be required to confirm waste classification of material leaving the site. It is strongly advised that detailed discussions be held with remediation/groundworks contractors and that receiving landfill sites are identified in advance of commencing any waste removal.

APPENDIX A – SERVICE CONSTRAINTS

APPENDIX A
SERVICE CONSTRAINTS

1. Service Constraints for all Reports

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Carbon Zero Consulting, Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

2. Service Constraints where the Report provides an intrusive assessment of ground conditions:

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together

with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

3. Service Constraints where the Report relates to Surface Water Management:

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.

3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not

been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibly for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

4. Service Constraints where the Report relates to Waste Management:

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK's assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

5. Service Constraints for Construction Environmental Management Plan Reports:

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

6. Service Constraints where the Report relates to Ground Gas Membrane Verification:

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/ radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

7. Service Constraints for Environmental Due Diligence (EDD)Reports:

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.

7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided

by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

8. Service Constraints for Ground source heat energy Reports:

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

9. Service Constraints for Water Abstraction Borehole Reports:

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.

APPENDIX B – FIGURES AND DRAWINGS

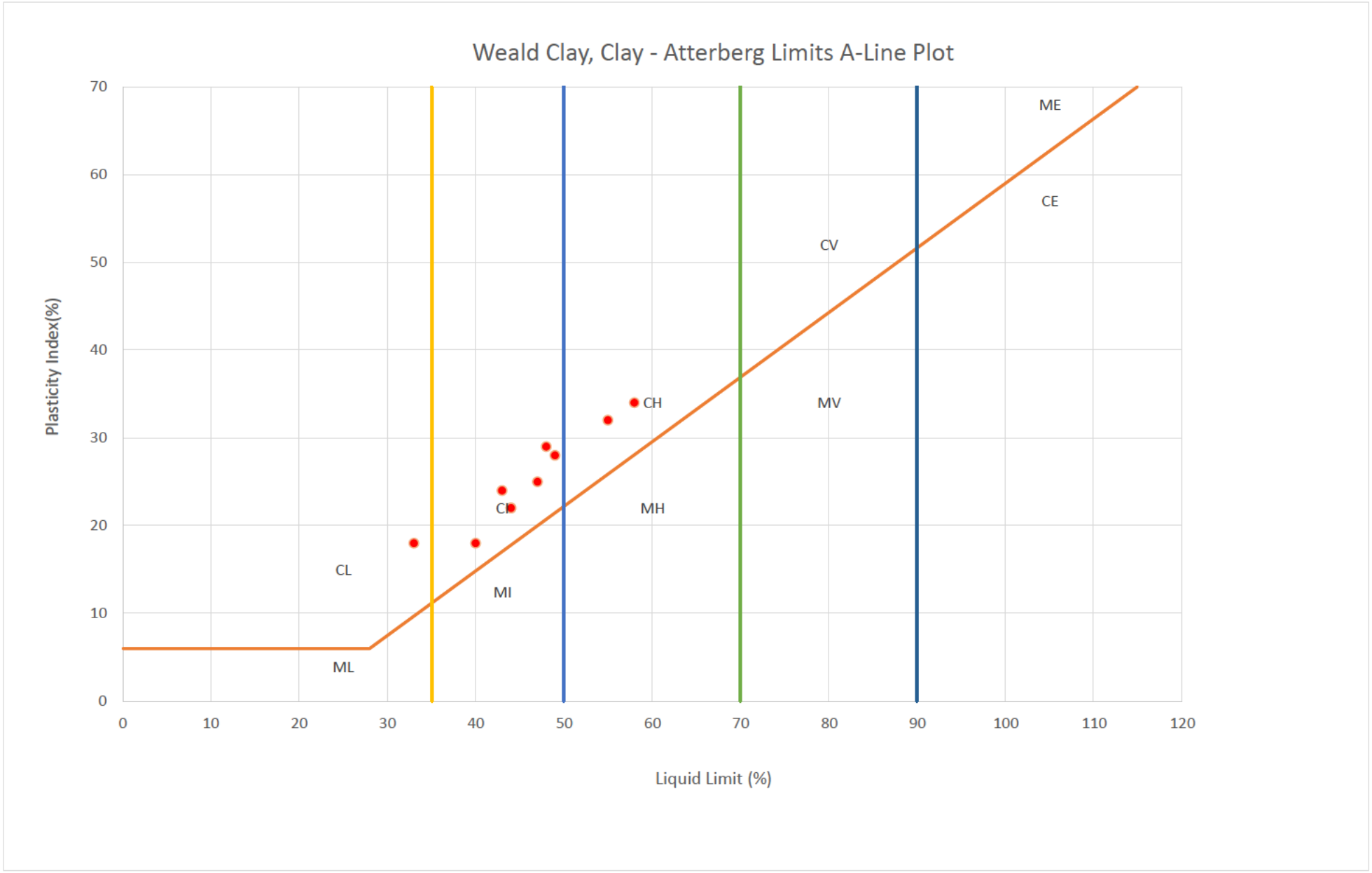
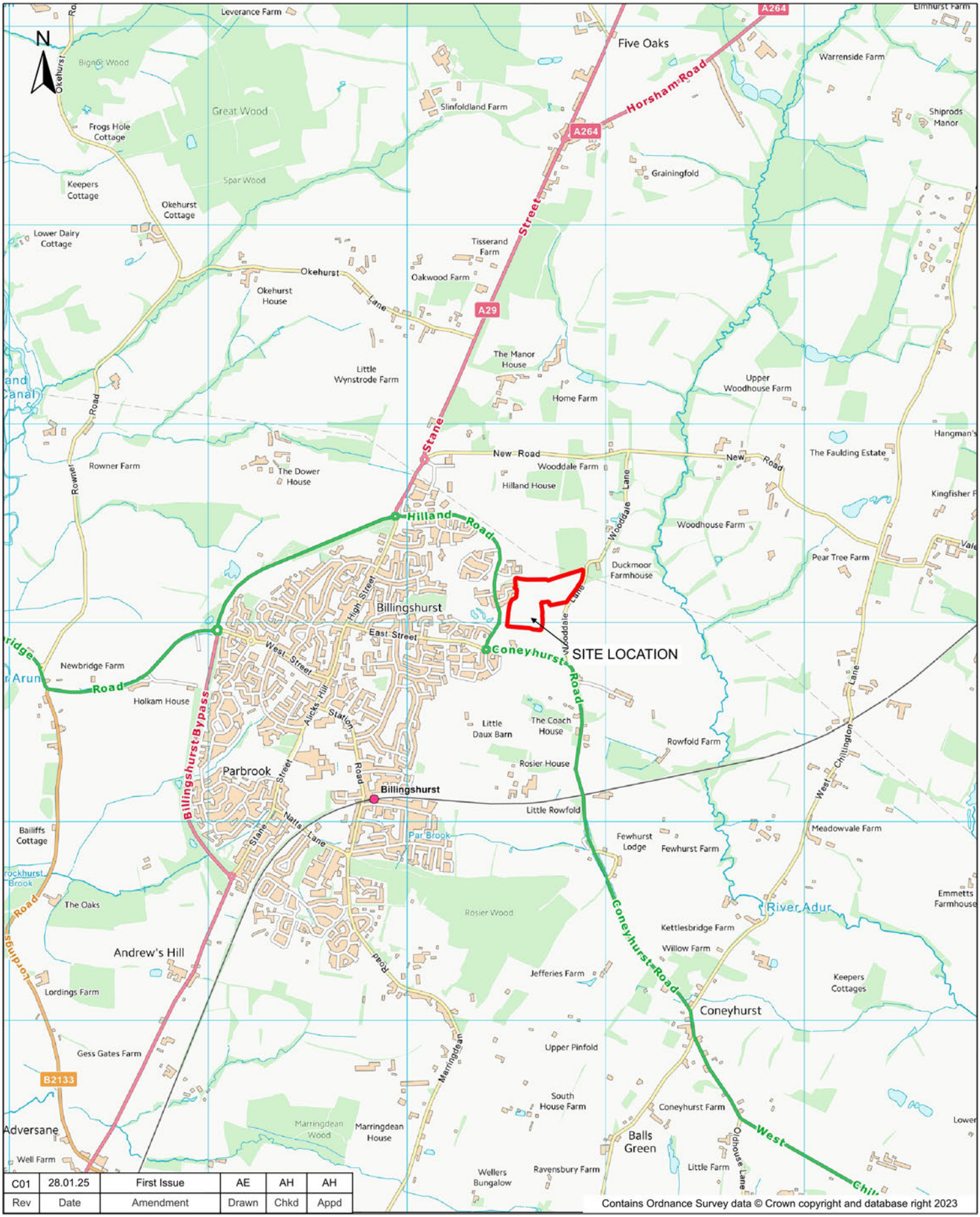


Figure 1
Atterberg Limits A-Line Plot



Rev	Date	Amendment	Drawn	Chkd	Appd
C01	28.01.25	First Issue	AE	AH	AH

leap environmental
part of RSK Geosciences
1 Forest Park Way, Pease Pottage,
West Sussex, RH11 9ZG

Client
Bellway Homes South London

Project Name
Duckmoor, Billingshurst

Description
Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	509655, 126020	3750859	11101	C01	3750859-LW-111-XX-D-G-11101-C01

DO NOT SCALE FROM THIS DRAWING

N

4VF140

National Grid Overhead Line

SSEN 11kV

SSEN 11kV

Track

Track

36.3m

38.5m

39.5m

WOODDALE LANE

HILLYFIELD

GTC Pipelines Ltd
P1714061/CP1

Pond

Pipelines Ltd
140614/CP2

Balancing

WS1
WS2
WS3
WS4
WS5
WS6

TP1
TP2
TP6
TP7
TP8
TP9
TP11
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20

Overview map of worksite

LEGEND

- Site Boundary
- Plant Crossing Point

Site Investigation Locations

- Window Sample Location (WS)
- Trial Pit Location (TP)

Notes:

Base plan provided by National Grid
Drawing Ref: 36110950

Base plan provided by SGN
Drawing Ref: 36110950

Base plan provided by SSEN
Drawing Ref: 36110950

Base plan provided by Southern Water
Drawing Ref: 36110950

Base plan provided by Openreach
Drawing Ref: 36110950

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	05.02.25	First Issue	MW	AH	AH

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West Sussex, RH11 9ZG

Client
Bellway Homes South London

Project Name
Duckmoor, Billingshurst

Description
Services Constraints Plan

Project ID	Drawing no.	Revision
3750859	11301	C01

File name
3750859-LW-113-XX-D-G-11301-C01

Dimensions	Scale	Size
m	1:1,500	A3

0 10 20 30 40 50 m

DO NOT SCALE FROM THIS DRAWING

509500

N

3 No. PARKLAND TREES

3 No. COUNTRYSIDE EDGE TREES

14 No. PARKLAND TREES

4 No. PARKLAND TREES

8 No. FOCAL AND STREET TREES

4 No. WETLAND TREES

12 No. PARKLAND TREES

2 No. WETLAND TREES

9 No. COUNTRYSIDE EDGE TREES

8 No. FOCAL AND STREET TREES

3 No. PARKLAND TREES

8 No. FOCAL AND STREET TREES

6 No. WETLAND TREES

2 No. WETLAND TREES

2 No. COUNTRYSIDE EDGE TREES

5 No. FOCAL AND STREET TREES

2 No. FOCAL AND STREET TREES

5 No. COUNTRYSIDE EDGE TREES

126000

126000

7 No. FOCAL AND STREET TREES

509500

LEGEND

Boundary

Notes:

Base plan provided by the client.
Drawing Ref: Proposed Development Plan

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	29.01.25	First Issue	AE	AH	AH

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West Sussex, RH11 9ZG

Client
Bellway Homes South London

Project Name
Duckmoor, Billingshurst

Description
Proposed Development Plan

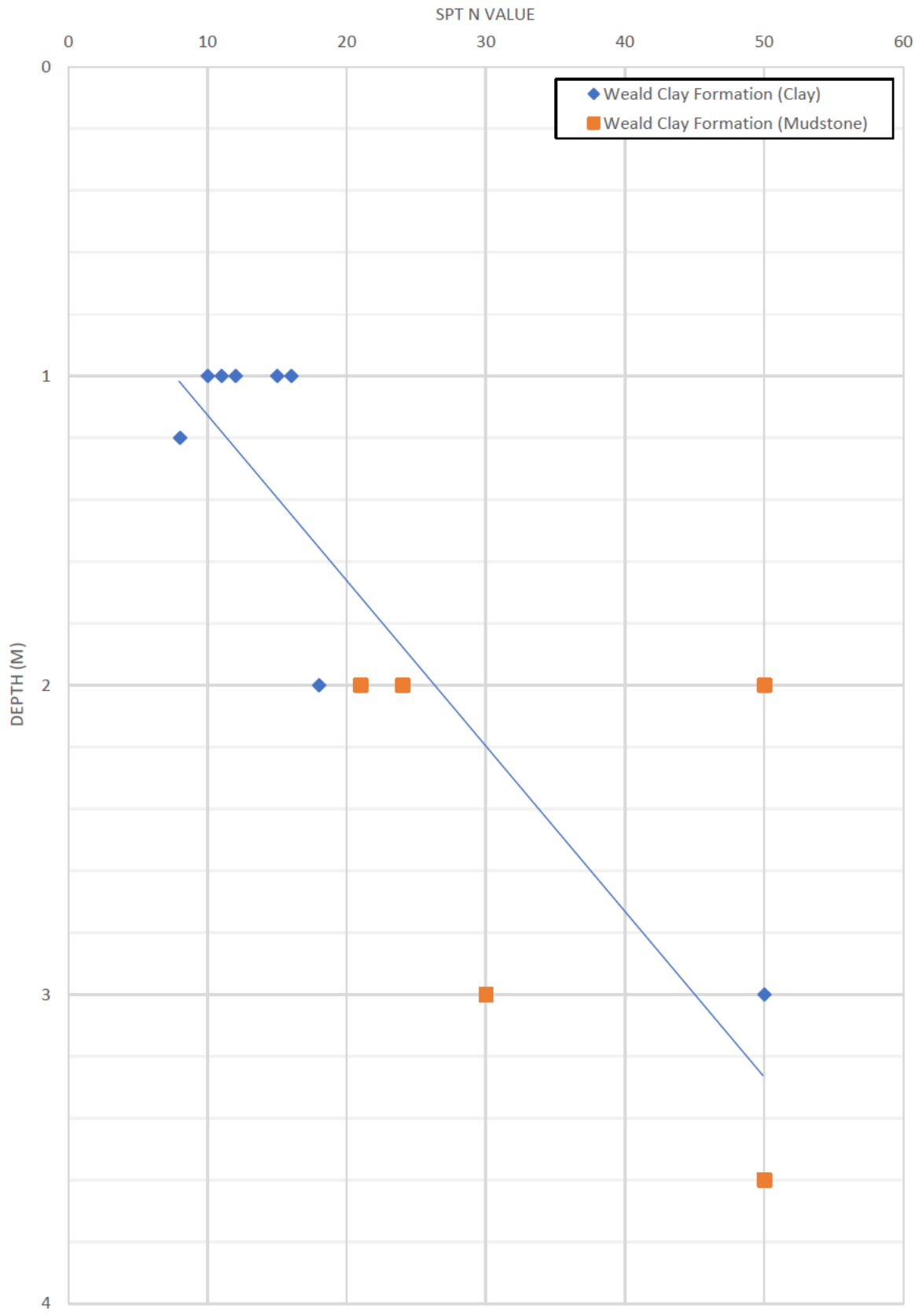
Project ID	Drawing no.	Revision
3750859	11601	C01

File name
3750859-LW-116-XX-D-G-11601-C01

Dimensions	Scale	Size
m	1:1,500	A3

0 10 20 30 40 50 m

Plot of SPT N Value (Corrected) vs. Depth



Project Number:	3750859	leap environmental	
Site:	Duckmoor, Billingshurst		**Fig. No**
Client:	Bellway Homes South Thames		2
Date:	24/03/2025		

APPENDIX C – PHOTOGRAPHIC RECORD



Plate 1 – Overview of the site from the site entrance on the eastern boundary of the site.



Plate 2 – Overview of JCB 3CX backhoe loader used for the trial pitting



Plate 3 – Overview of recovered Weald Clay Formation clay over silty clay topsoil



Plate 4 – Overview of recovered orangish brown Weald Clay Formation clay



Plate 5 – Overview of goal posts used for crossing beneath overhead cables



Plate 6 – Overview of reddish-brown Weald Clay Formation clay



Plate 7 – Overview of selenite crystal found within the Weald Clay Formation



Plate 8 – Overview of recovered arising from the window sample drilling



Plate 9 – Overview of raised cover monitoring installation



Plate 10 – Overview of reddish brown Weald Clay Formation clay



Plate 11 – Overview of recovered arising from the window sample drilling



Plate 12 – Overview of the site showing the mature trees around the boundary of the site and the overhead power lines

APPENDIX D – EXPLORATORY LOGS

Leap Environmental Ltd
The Atrium, Curtis Road
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Tel: 01306 646510
www.leapenvironmental.com

Trial Pit Log

Trialpit No
TP01
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509632 - 126195 Level: 40.63	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	40.43		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				1.50	39.13		Firm to stiff light brown slightly orange and light grey mottled silty CLAY.
	1.80 - 2.00	B		3.00	37.63		Stiff to very stiff friable dark reddish brown silty CLAY. *Becoming less red with depth from 2.5m* End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Seepage at ground level.Dry and stable pit.

Stability:

AGS

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Trial Pit Log

Trialpit No
TP02
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509695 - 126189 Level: 40.22	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30	ES		0.30	39.92		TOPSOIL: Grass over dark brown silty CLAY, with rootless.
	1.00 - 1.20	B		1.20	39.02		Stiff light brown and grey mottled silty CLAY.
	2.60 - 3.00	B		2.60	37.62		Friable reddish brown silty CLAY.
				3.00	37.22		Weak friable bluish grey and light brown mottled laminated MUDSTONE, with occasional selenite crystals.
							End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Water seepage from ground level.

Stability:

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Trial Pit Log

Trialpit No
TP06
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509582 - 126163 Level: 40.17	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.97		TOPSOIL: Grass over brown silty CLAY, with rootlets.
	0.80 - 1.00	B		1.00	39.17		Firm to stiff orange and light grey mottled silty CLAY.
							Very stiff friable brown sandy silty CLAY. Sand is fine.
							Rare iron staining at 1.8m
	2.50 - 2.80	B		2.50	37.67		Very weak friable brown dark grey MUDSTONE.
							Layer of soft dark brown organic matter from 2.5m to 2.8m
				3.00	37.17		End of pit at 3.00 m

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Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Seepage from ground level.

Stability:

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Trial Pit Log

Trialpit No
TP07
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509639 - 126163 Level: 40.27	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	40.07		TOPSOIL: Grass over dark brown and grey mottled silty CLAY, with rootlets.
	0.80 - 1.00	B		0.80	39.47		Stiff grey and orangish brown mottled slightly sandy silty CLAY. Sand is fine.
				1.20	39.07		Stiff reddish orange and grey mottled slightly sandy silty CLAY. Sand is fine.
	1.80 - 2.20	B		1.80	38.47		Reddish orange and grey mottled clayey SAND. Sand is fine to medium.
				2.20	38.07		Stiff grey bluish silty CLAY.
				3.00	37.27		Very weak friable reddish brownish grey laminated MUDSTONE. Traces of red iron staining.
							End of pit at 3.00 m

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Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Water seepage from ground level.

Stability:

AGS

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Trial Pit Log

Trialpit No
TP08
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509683 - 126165 Level: 39.84	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30	ES		0.30	39.54		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				1.00	38.84		Stiff grey and brown mottled silty CLAY.
	1.80 - 2.00	D		2.00	37.84		Friable reddish brown silty CLAY.
				3.00	36.84		Very weak friable grey and orange mottled MUDSTONE. *Rare fragments of selenite crystals* End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Water seepage from ground level.

Stability:

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Trial Pit Log

Trialpit No
TP09
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509749 - 126160 Level: 40.19	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.99		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
							Stiff reddish brown silty CLAY.
			HVP=63				*Hand Shear Vane at 0.8 m depth = 63 kPa*
	1.00 - 1.20	B		1.00	39.19		Very stiff friable grey and brown mottled silty CLAY.
				2.00	38.19		Very weak friable bluish grey MUDSTONE. *Hand Shear Vane at 2.0 m depth = 130+ kPa*
				3.00	37.19		End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Water seepage at 0.2m

Stability:

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Trial Pit Log

Trialpit No
TP11
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509578 - 126127 Level: 39.97	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.77		TOPSOIL: Grass over brown silty CLAY, with rootless.
	0.80 - 1.00	B		0.80	39.17		Firm to stiff orange light grey and brown mottled silty CLAY.
				1.80	38.17		Stiff to very stiff red and slightly light grey mottled silty CLAY.
				3.00	36.97		Very weak friable red MUDSTONE. Recovered as brittle fragments.
							End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Trial pit completed to 3m.Trial pit remained dry and stable.Backfilled with arisings.

Stability:

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Trial Pit Log

Trialpit No
TP12
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509631 - 126134 Level: 40.16	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.96		TOPSOIL: Grass over brown silty CLAY, with rootlets.
				1.00	39.16		Stiff grey brown and orange mottled silty CLAY.
	1.50 - 1.70	B		1.80	38.36		Stiff friable orangish brown slightly sandy silty CLAY. Sand is fine.
				2.00	38.16		Very stiff bluish grey silty CLAY.
				3.00	37.16		Very weak friable bluish grey laminated MUDSTONE. *Layer of dark brown soft organic material at 2.5m* End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.

Stability:

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Trial Pit Log

Trialpit No
TP13
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509789 - 126147 Level: 40.39	Date 11/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	40.19		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				0.80	39.59		Firm light grey and brown mottled silty CLAY.
							Stiff friable red silty CLAY.
							Becoming light brown grey from 1.5m
							Becoming very friable at 1.70m
				1.80	38.59		Very stiff friable bluish grey and brown mottled silty CLAY.
				2.20	38.19		Very weak friable greyish brown MUDSTONE.
				3.00	37.39		End of pit at 3.00 m

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Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.No groundwater encountered.

Stability:

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Trial Pit Log

Trialpit No
TP14
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords: 509567 - 126076 Level: 39.63	Date 12/02/2025
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 2.20	Scale 1:25
Client:	Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.43		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
							Firm orangish brown and grey mottled silty CLAY.
							Hand Shear Vane at 0.5 m depth = 65 kPa
	0.50 - 0.70	B	HVP=65	0.50	39.13		Very weak friable bluish grey MUDSTONE.
							Hand Shear Vane at 2.0 m depth = 130+ kPa
							Becoming reddish purple and grey mottled in colour
				2.20	37.43		End of pit at 2.20 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.Terminated at 2.20m as it was too hard to excavate.

Stability:

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Trial Pit Log

Trialpit No
TP15
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509597 - 126058 Level: 39.81	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES					TOPSOIL: Grass over brown silty CLAY, with rootlets.
				0.20	39.61		Firm orangish brown silty CLAY. Rare clasts of selenite.
			HVP=71				*Hand Shear Vane at 1.0 m depth = 71 kPa*
				1.50	38.31		Very stiff friable grey and brownish red mottled silty CLAY.
				2.30	37.51		Very weak friable bluish grey laminated MUDSTONE.
							Hand Shear Vane at 2.3 m depth = 130+ kPa
	2.60 - 2.80	B					
				3.00	36.81		End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.

Stability:

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Trial Pit Log

Trialpit No
TP16
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509651 - 126051 Level: 39.70	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.20	ES					TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				0.20	39.50		Firm orangish red silty CLAY.
			HVP=70	0.40	39.30		*Hand Shear Vane at 0.4 m depth = 70 kPa*
							Friable brownish grey slightly sandy silty CLAY. Sand is fine.
				1.50	38.20		Stiff grey and light brown mottled silty CLAY.
	2.00 - 2.20	B					*Hand Shear Vane at 2.0 m depth = 130+ kPa*
				2.50	37.20		Very weak friable bluish red MUDSTONE.
				3.00	36.70		End of pit at 3.00 m

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Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.No groundwater encountered.

Stability:

AGS

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Trial Pit Log

Trialpit No
TP17
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509537 - 126024 Level: 38.60	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	38.40		TOPSOIIL: Grass over dark brown silty CLAY, with rootlets.
				0.40	38.20		Firm orangish light brown silty CLAY.
	0.80 - 1.00	B	HVP=88				Stiff to very stiff brownish red silty CLAY. *Recovered as friable fragments of red silty CLAY from 0.7 to 1.0m* *Hand Shear Vane at 1.0 m depth = 88 kPa*
				2.00	36.60		Very stiff friable greyish blue silty CLAY. *Hand Shear Vane at 2.0 m depth = 130+ kPa*
				2.50	36.10		Very weak friable greyish blue MUDSTONE.
				3.00	35.60		End of pit at 3.00 m

1 2 3 4 5

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Water seepage from surface.

Stability:

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Trial Pit Log

Trialpit No
TP18
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509599 - 126026 Level: 39.76	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	39.56		TOPSOIL: Grass over brown silty CLAY. Rootlets.
				0.40	39.36		Stiff light brown orange silty CLAY.
			HVP=61				Stiff purple reddish brown silty CLAY. *Hand Shear Vane at 0.5m depth = 61 kPa*
	0.80 - 1.00	B					
				1.80	37.96		Very stiff friable brownish red silty CLAY.
				2.50	37.26		Very weak light grey and red mottled MUDSTONE. Rare iron staining. *Hand Shear Vane at 2.5m depth = 130+ kPa*
				3.00	36.76		End of pit at 3.00 m

1 2 3 4 5

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.

Stability:

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Trial Pit Log

Trialpit No
TP19
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509557 - 125998 Level: 39.38	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES					TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				0.20	39.18		Stiff brownish red silty CLAY.
			HVP=75				*Becoming red with depth from 1.0m* *Hand Shear Vane at 1.0 m depth = 75 kPa*
				1.20	38.18		Very stiff grey and dark red mottled CLAY.
	1.50 - 1.70	B					
							Recovered as friable fragments from 2.0m
				2.30	37.08		Very weak friable purple red MUDSTONE.
							Hand Shear Vane at 2.5 m depth = 130+ kPa
				3.00	36.38		End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.

Stability:

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Trial Pit Log

Trialpit No
TP20
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509617 - 125994 Level: 40.70	Date 12/02/2025
Location: Wooddale Lane, Billingshurst RH14 9SZ		Dimensions (m): Depth 3.00	Scale 1:25
Client: Bellways Homes South Thames			Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES		0.20	40.50		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
				0.50	40.20		Stiff light grey silty CLAY. Occasional clasts of selenite.
			HVP=70	1.00	39.70		Stiff greyish red silty CLAY. *Hand Shear Vane at 0.8 m depth = 70 kPa* Stiff friable brownish red silty CLAY.
	2.50 - 2.70	B		2.50	38.20		Very weak friable purple bluish red laminated MUDSTONE.
				3.00	37.70		End of pit at 3.00 m

Remarks: Position scanned with a CAT, Genny and GPR prior to excavation.Dry and stable pit.

Stability:

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Borehole Log

Borehole No. **WS1**
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords:	509584 - 126192	Hole Type WS
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Level:	40.70	Scale 1:20
Client:	Bellways Homes South Thames		Dates:	12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	40.50		TOPSOIL: Grass over dark brown silty CLAY, with rootlets.
		0.50	ES					Stiff light grey silty CLAY.
		1.00		N=10				
					1.40	39.30		Very stiff red silty CLAY.
		2.00		N=21	1.95	38.75		Very weak light grey to light brown mottled MUDSTONE.
		3.00		N=30				
		3.40 - 3.60	B					
		3.60		N=68	3.60	37.10		End of borehole at 3.60 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Refused at 3.6m.1m plain and 2.6m slotted pipe installed.

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Borehole Log

Borehole No. **WS2**
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords:	509679 - 126125	Hole Type WS
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Level:	39.60	Scale 1:20
Client:	Bellways Homes South Thames		Dates:	12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	ES					TOPSOIL: Grass over dark brown silty CLAY, with common rootlets.
					0.20	39.40		Stiff light brown and slightly grey mottled silty CLAY.
		1.00		N=16				
					1.80	37.80		Stiff to very stiff red light brown and light grey mottled silty CLAY.
		2.00		N=18				
		3.00		N=56	3.00	36.60		End of borehole at 3.00 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Refused at 3m.Installed 1m plain and 2m slotted pipe.

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Borehole Log

Borehole No.
WS3
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords:	509753 - 126111	Hole Type WS
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Level:	39.28	Scale 1:20
Client:	Bellways Homes South Thames		Dates:	12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	39.08		TOPSOIL: Grass over dark brown silty CLAY, with common rootlets.
								Stiff light brown silty CLAY.
					0.90	38.38		Stiff red silty CLAY.
		1.00		N=15				
					1.90	37.38		Very weak grey brown MUDSTONE.
		2.00		N=55	2.00	37.28		End of borehole at 2.00 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Refused at 2.0mInstalled with 1m plain pipe and 1m slotted pipe.

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Borehole Log

Borehole No.
WS4
Sheet 1 of 1

Project Name: Duckmoor	Project No. 3750859	Co-ords: 509641 - 126081	Hole Type WS
Location: Wooddale Lane, Billingshurst RH14 9SZ		Level: 39.75	Scale 1:20
Client: Bellways Homes South Thames		Dates: 12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	ES					TOPSOIL: Grass over dark brown silty CLAY, with common rootlets.
					0.20	39.55		Firm to stiff light brown to brown mottled silty CLAY.
		0.80 - 1.00	D					
		1.00		N=12				
					1.10	38.65		Stiff light grey and red mottled silty CLAY.
		2.00		N=24				
					2.10	37.65		Very weak light brown and slightly light grey mottled MUDSTONE.
		3.00		N=30				
		3.50 - 4.00	D					
		4.00		N=51	4.00	35.75		End of borehole at 4.00 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Installed with 1m plain pipe and 3m slotted pipe.

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Borehole Log

Borehole No.
WS5
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords:	509540 - 126055	Hole Type WS
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Level:	39.00	Scale 1:20
Client:	Bellways Homes South Thames		Dates:	12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.50	ES					TOPSOIL: Grass over brown silty CLAY, with common rootlets.
					0.20	38.80		Firm to stiff light brown to brown mottled silty CLAY.
		0.90 - 1.00	D		0.90	38.10		Stiff brownish red silty CLAY.
		1.00		N=11				
					1.90	37.10		Very weak light brown light grey and red mottled MUDSTONE.
		2.00		N=55	2.00	37.00		End of borehole at 2.00 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Installed with 1m plain pipe and 1m slotted pipe.Refused at 2.0m.

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Borehole Log

Borehole No. **WS6**
Sheet 1 of 1

Project Name:	Duckmoor	Project No. 3750859	Co-ords:	509643 - 126009	Hole Type WS
Location:	Wooddale Lane, Billingshurst RH14 9SZ		Level:	40.25	Scale 1:20
Client:	Bellways Homes South Thames		Dates:	12/02/2025 - 12/02/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.50	ES					TOPSOIL: Grass over brown silty CLAY, with common rootlets.
					0.20	40.05		Firm to stiff light brown to brown mottled silty CLAY.
					0.90	39.35		Stiff brownish red silty CLAY.
		1.20		N=8				
		1.80 - 2.00	D					
		2.00		N=24	2.00	38.25		Very weak light brown light grey and red mottled MUDSTONE.
		2.80		N=78				
					3.00	37.25		End of borehole at 3.00 m

Remarks
Position scanned with a CAT, Genny and GPR prior to excavation.Inspection pit hand dug to 1.2m depth.No groundwater encountered.Installed with 1.0m plain pipe and 2.0m slotted pipe.Refused at 3.0m.

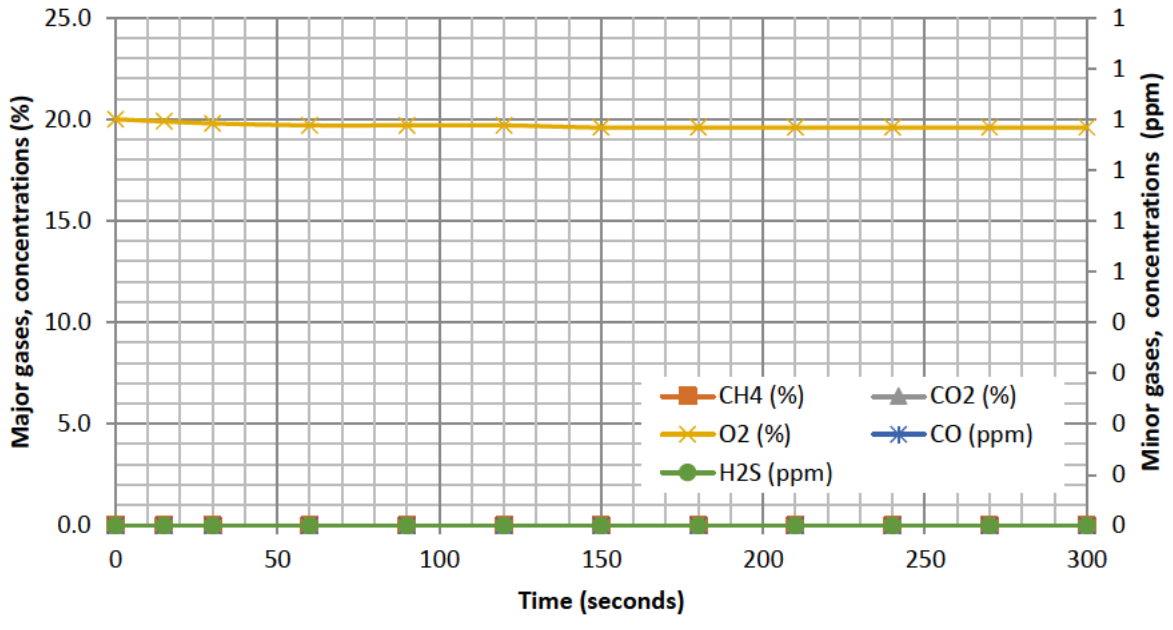
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APPENDIX E – GROUND GAS MONITORING RECORDS

Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)	1011				

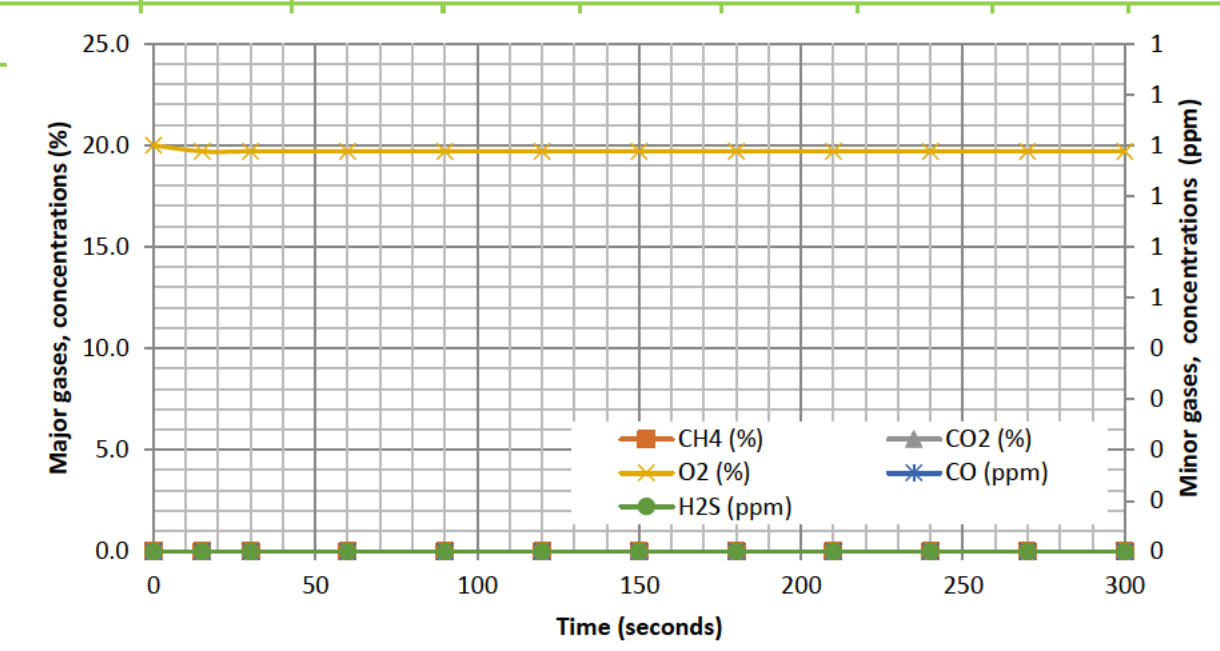
WS1		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.1	0.0	0.0	20.0	0	0
Hole ID		00:15	0.1	0.0	0.0	19.9	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.0	19.8	0	0
		01:00	0.2	0.0	0.0	19.7	0	0
VOC steady (ppm)	0.0	01:30	0.6	0.0	0.0	19.7	0	0
		02:00	1.6	0.0	0.0	19.7	0	0
Borehole Depth (mbgl)	3.8	02:30	0.1	0.0	0.0	19.6	0	0
		03:00	0.4	0.0	0.0	19.6	0	0
Water level (mbgl)	2.5	03:30	0.1	0.0	0.0	19.6	0	0
		04:00	0.1	0.0	0.0	19.6	0	0
Borehole Pressure (mb)	5.0	04:30	0.1	0.0	0.0	19.6	0	0
		05:00	0.1	0.0	0.0	19.6	0	0
Peak flow (ʃ/h)	1.7							



Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)	1026				

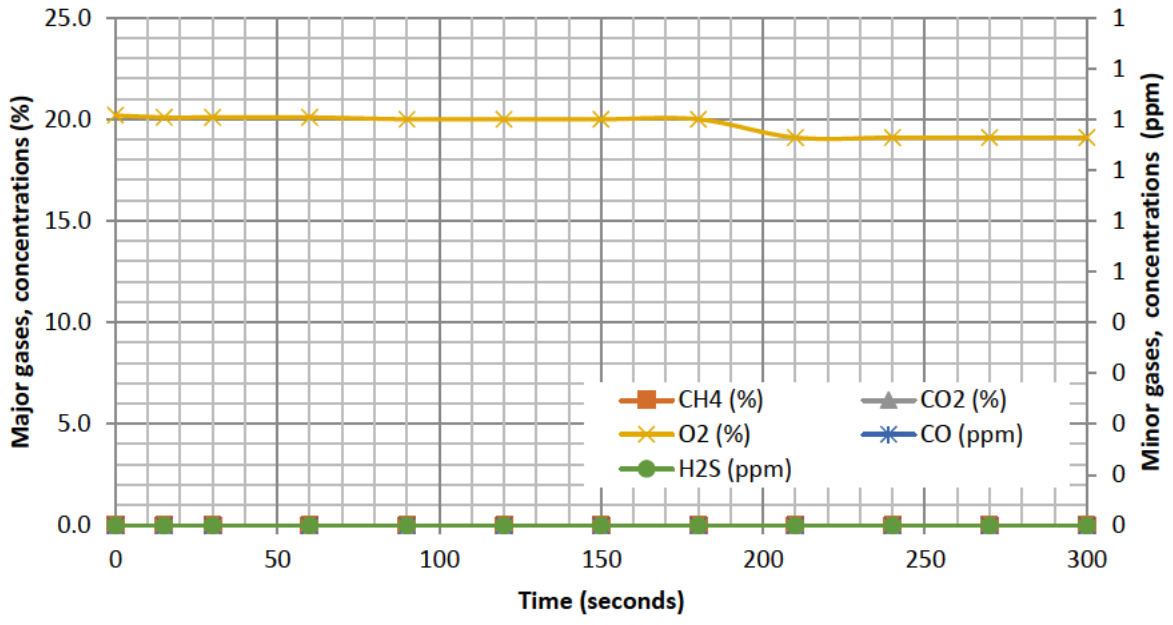
WS2		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	-20.0	0.0	0.0	20.0	0	0
Hole ID		00:15	0.0	0.0	0.0	19.7	0	0
VOC peak (ppm)	0.1	00:30	0.0	0.0	0.0	19.7	0	0
		01:00	0.0	0.0	0.0	19.7	0	0
VOC steady (ppm)	0.1	01:30	0.1	0.0	0.0	19.7	0	0
		02:00	0.0	0.0	0.0	19.7	0	0
Borehole Depth (mbgl)	2.8	02:30	0.0	0.0	0.0	19.7	0	0
		03:00	0.0	0.0	0.0	19.7	0	0
Water level (mbgl)	0.6	03:30	0.0	0.0	0.0	19.7	0	0
		04:00	0.0	0.0	0.0	19.7	0	0
Borehole Pressure (mb)	2.0	04:30	0.0	0.0	0.0	19.7	0	0
		05:00	0.0	0.0	0.0	19.7	0	0
Peak flow (ʃ/h)	0.1							



Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1012				

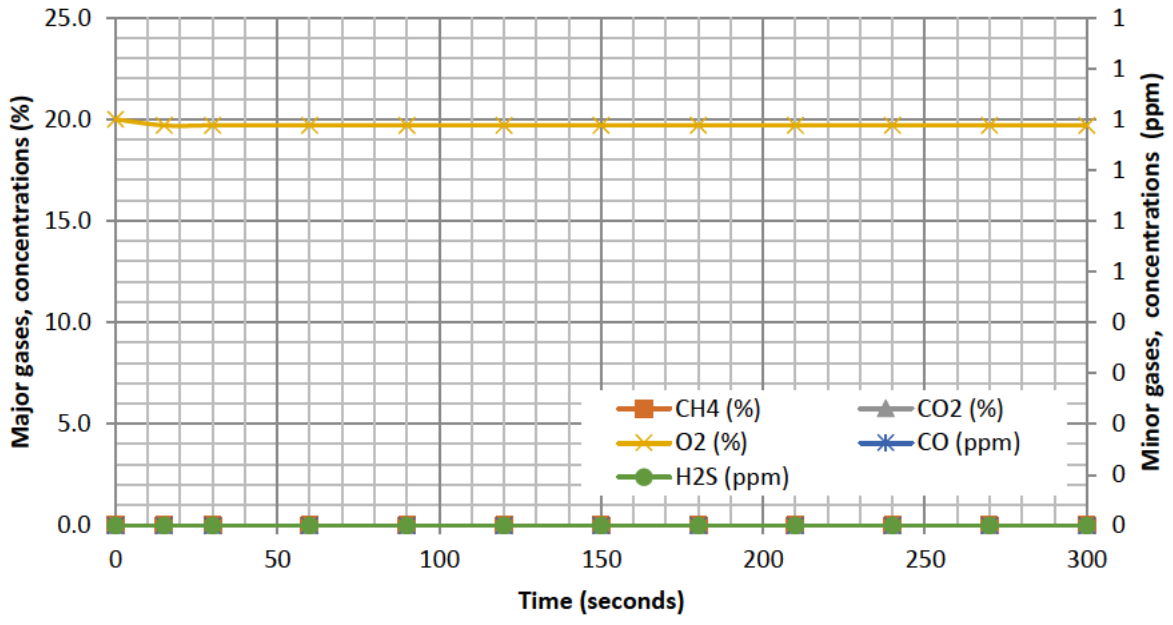
WS3		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.2	0	0
Hole ID		00:15	0.0	0.0	0.0	20.1	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.0	20.1	0	0
		01:00	0.0	0.0	0.0	20.1	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.0	20.0	0	0
		02:00	0.0	0.0	0.0	20.0	0	0
Borehole Depth (mbgl)	1.9	02:30	0.0	0.0	0.0	20.0	0	0
		03:00	0.0	0.0	0.0	20.0	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.0	19.1	0	0
		04:00	0.0	0.0	0.0	19.1	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	0.0	0.0	19.1	0	0
		05:00	0.0	0.0	0.0	19.1	0	0
Peak flow (ʃ/h)	0.0							



Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1012				

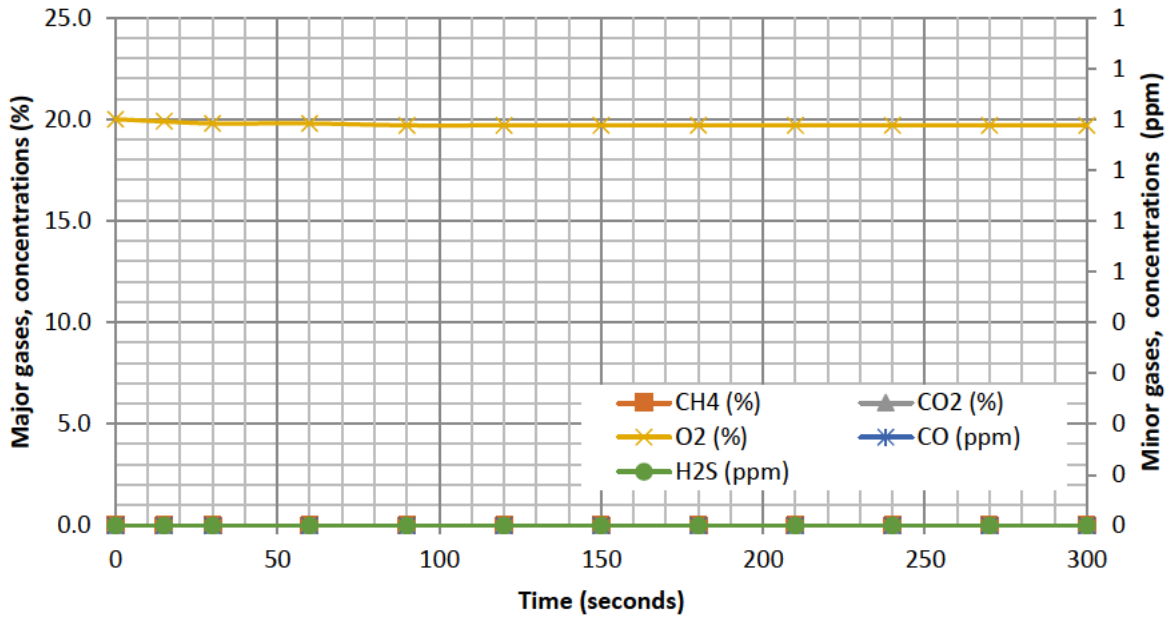
WS4		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	-2.0	0.0	0.0	20.0	0	0
Hole ID		00:15	-1.9	0.0	0.0	19.7	0	0
VOC peak (ppm)	0.0	00:30	-1.9	0.0	0.0	19.7	0	0
		01:00	-1.9	0.0	0.0	19.7	0	0
VOC steady (ppm)	0.0	01:30	-1.9	0.0	0.0	19.7	0	0
		02:00	-1.9	0.0	0.0	19.7	0	0
Borehole Depth (mbgl)	3.9	02:30	-1.9	0.0	0.0	19.7	0	0
		03:00	-1.9	0.0	0.0	19.7	0	0
Water level (mbgl)	Dry	03:30	-1.9	0.0	0.0	19.7	0	0
		04:00	-1.9	0.0	0.0	19.7	0	0
Borehole Pressure (mb)	-23.0	04:30	-1.9	0.0	0.0	19.7	0	0
		05:00	-1.9	0.0	0.0	19.7	0	0
Peak flow (ʃ/h)	-1.8							



Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1020				

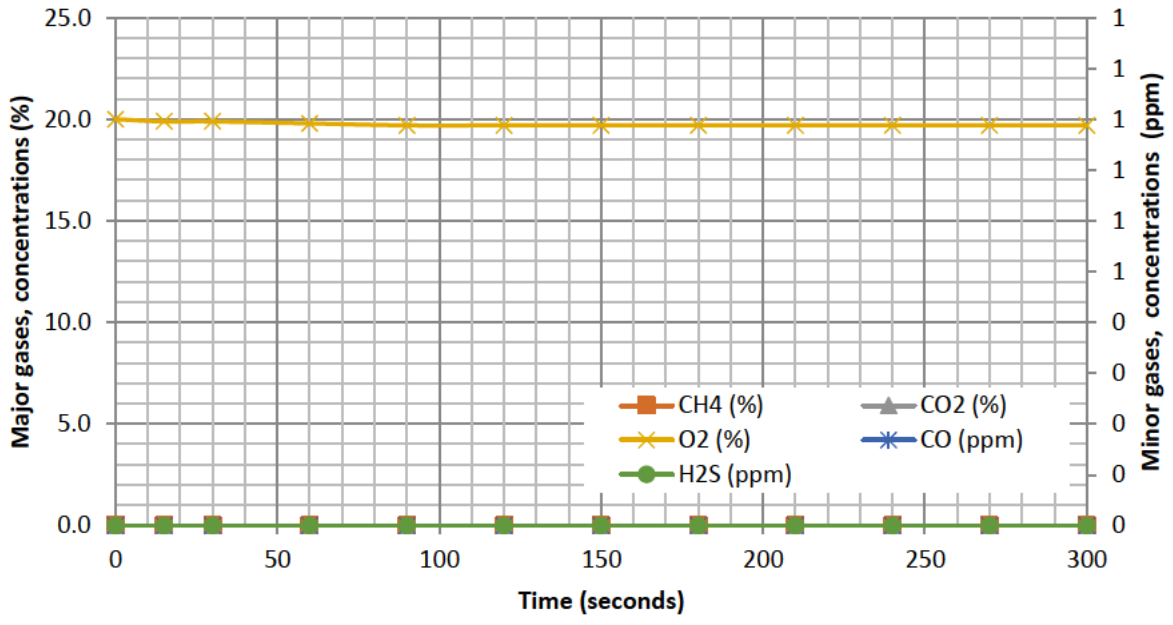
WS5		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.3	0.0	0.0	20.0	0	0
Hole ID		00:15	0.0	0.0	0.0	19.9	0	0
VOC peak (ppm)	0.0	00:30	0.1	0.0	0.0	19.8	0	0
		01:00	0.3	0.0	0.0	19.8	0	0
VOC steady (ppm)	0.0	01:30	0.3	0.0	0.0	19.7	0	0
		02:00	0.3	0.0	0.0	19.7	0	0
Borehole Depth (mbgl)	1.9	02:30	-0.2	0.0	0.0	19.7	0	0
		03:00	0.3	0.0	0.0	19.7	0	0
Water level (mbgl)	Dry	03:30	0.3	0.0	0.0	19.7	0	0
		04:00	0.3	0.0	0.0	19.7	0	0
Borehole Pressure (mb)	3.0	04:30	0.3	0.0	0.0	19.7	0	0
		05:00	0.3	0.0	0.0	19.7	0	0
Peak flow (ʃ/h)	3.0							



Continuous Gas Monitoring Record

Date	26/02/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)	1009				

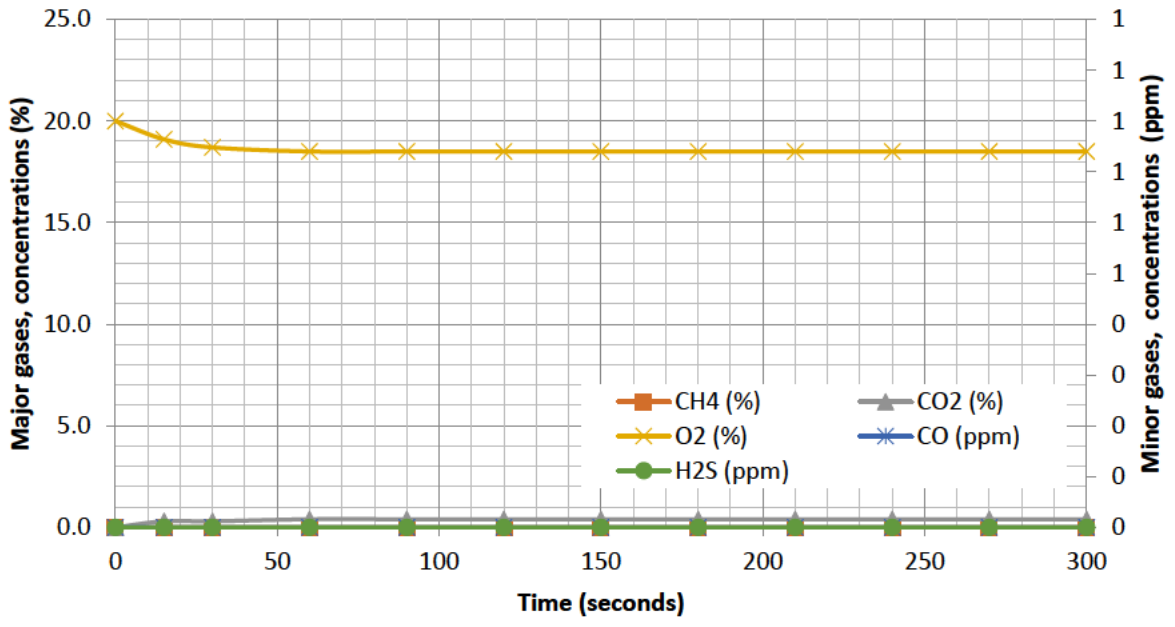
WS6		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	4.8	0.0	0.0	20.0	0	0
Hole ID		00:15	0.0	0.0	0.0	19.9	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.0	19.9	0	0
		01:00	0.0	0.0	0.0	19.8	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.0	19.7	0	0
		02:00	0.2	0.0	0.0	19.7	0	0
Borehole Depth (mbgl)	2.78	02:30	0.0	0.0	0.0	19.7	0	0
		03:00	0.0	0.0	0.0	19.7	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.0	19.7	0	0
		04:00	0.0	0.0	0.0	19.7	0	0
Borehole Pressure (mb)	0	04:30	0.0	0.0	0.0	19.7	0	0
		05:00	0.0	0.0	0.0	19.7	0	0
Peak flow (ʃ/h)	4.8							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)	1026				

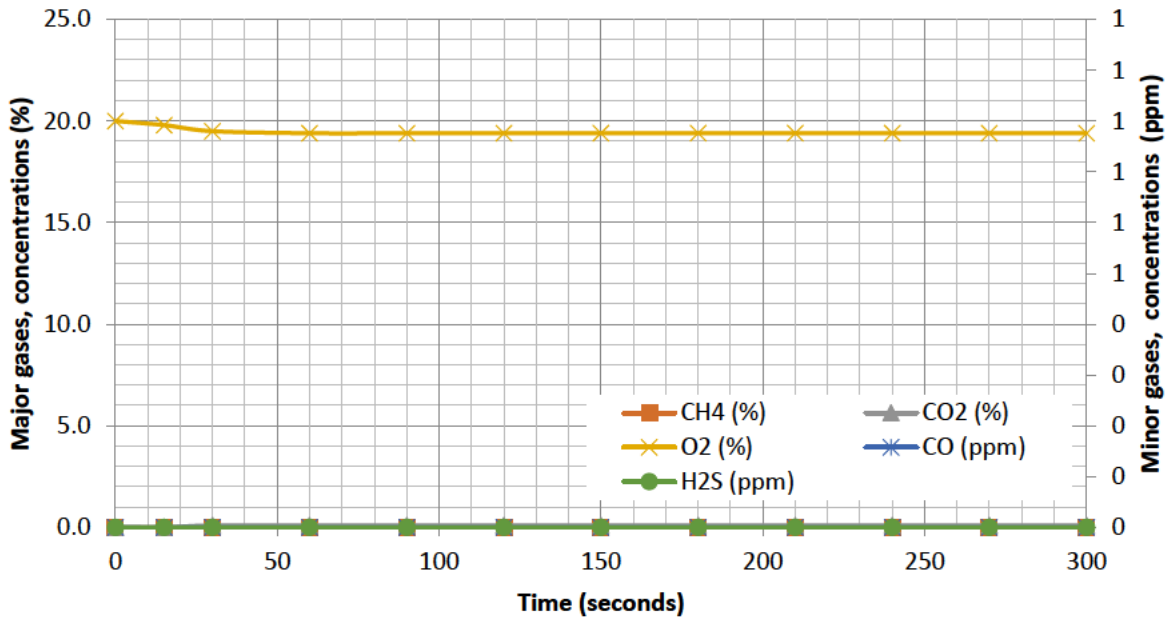
WS1		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.0	0	0
Hole ID		00:15	0.1	0.0	0.3	19.1	0	0
VOC peak (ppm)	0.0	00:30	0.1	0.0	0.3	18.7	0	0
		01:00	0.2	0.0	0.4	18.5	0	0
VOC steady (ppm)	0.0	01:30	0.2	0.0	0.4	18.5	0	0
		02:00	0.2	0.0	0.4	18.5	0	0
Borehole Depth (mbgl)	3.8	02:30	0.3	0.0	0.4	18.5	0	0
		03:00	0.3	0.0	0.4	18.5	0	0
Water level (mbgl)	2.4	03:30	0.4	0.0	0.4	18.5	0	0
		04:00	0.4	0.0	0.4	18.5	0	0
Borehole Pressure (mb)	4.0	04:30	0.5	0.0	0.4	18.5	0	0
		05:00	0.5	0.0	0.4	18.5	0	0
Peak flow (ʃ/h)	0.6							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)		1026			

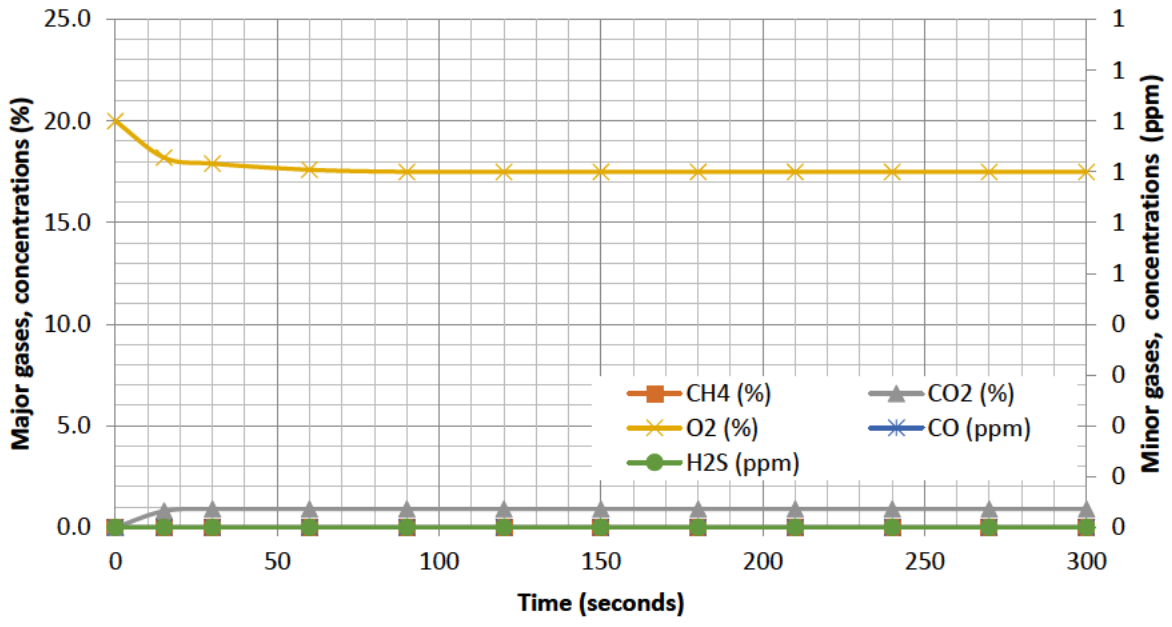
WS2		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	-0.7	0.0	0.0	20.0	0	0
Hole ID		00:15	-0.1	0.0	0.0	19.8	0	0
VOC peak (ppm)	0.0	00:30	0.1	0.0	0.1	19.5	0	0
		01:00	0.1	0.0	0.1	19.4	0	0
VOC steady (ppm)	0.0	01:30	0.1	0.0	0.1	19.4	0	0
		02:00	0.1	0.0	0.1	19.4	0	0
Borehole Depth (mbgl)	2.8	02:30	0.1	0.0	0.1	19.4	0	0
		03:00	0.1	0.0	0.1	19.4	0	0
Water level (mbgl)	0.6	03:30	0.1	0.0	0.1	19.4	0	0
		04:00	0.1	0.0	0.1	19.4	0	0
Borehole Pressure (mb)	1.0	04:30	0.1	0.0	0.1	19.4	0	0
		05:00	0.1	0.0	0.1	19.4	0	0
Peak flow (ʃ/h)	0.2							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1027				

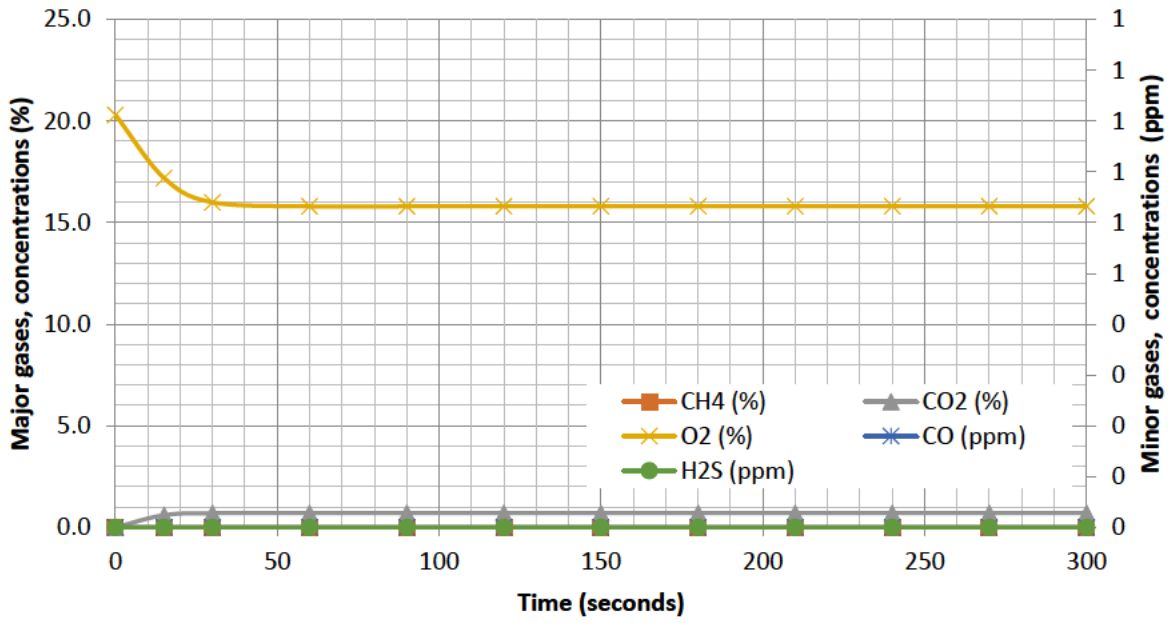
WS3		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.0	0	0
Hole ID		00:15	0.0	0.0	0.8	18.2	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.9	17.9	0	0
		01:00	0.0	0.0	0.9	17.6	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.9	17.5	0	0
		02:00	0.0	0.0	0.9	17.5	0	0
Borehole Depth (mbgl)	1.90	02:30	0.0	0.0	0.9	17.5	0	0
		03:00	0.0	0.0	0.9	17.5	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.9	17.5	0	0
		04:00	0.0	0.0	0.9	17.5	0	0
Borehole Pressure (mb)	1	04:30	0.0	0.0	0.9	17.5	0	0
		05:00	0.0	0.0	0.9	17.5	0	0
Peak flow (ʃ/h)	0							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1028				

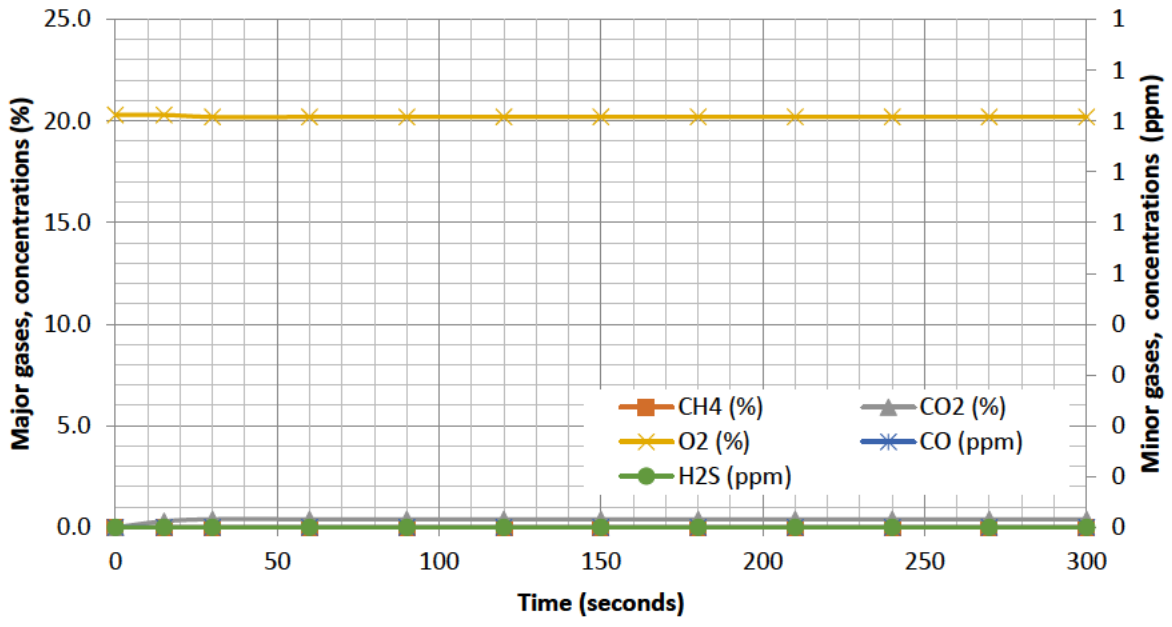
WS4		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.3	0	0
Hole ID		00:15	0.0	0.0	0.6	17.2	0	0
VOC peak (ppm)	0.1	00:30	0.0	0.0	0.7	16.0	0	0
		01:00	0.1	0.0	0.7	15.8	0	0
VOC steady (ppm)	0.0	01:30	0.1	0.0	0.7	15.8	0	0
		02:00	0.2	0.0	0.7	15.8	0	0
Borehole Depth (mbgl)	3.9	02:30	0.2	0.0	0.7	15.8	0	0
		03:00	0.3	0.0	0.7	15.8	0	0
Water level (mbgl)	Dry	03:30	0.3	0.0	0.7	15.8	0	0
		04:00	0.3	0.0	0.7	15.8	0	0
Borehole Pressure (mb)	5.0	04:30	0.4	0.0	0.7	15.8	0	0
		05:00	0.4	0.0	0.7	15.8	0	0
Peak flow (ʃ/h)	0.4							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	11				
Site	Duckmoor	Ambient Pressure (mb)	1027				

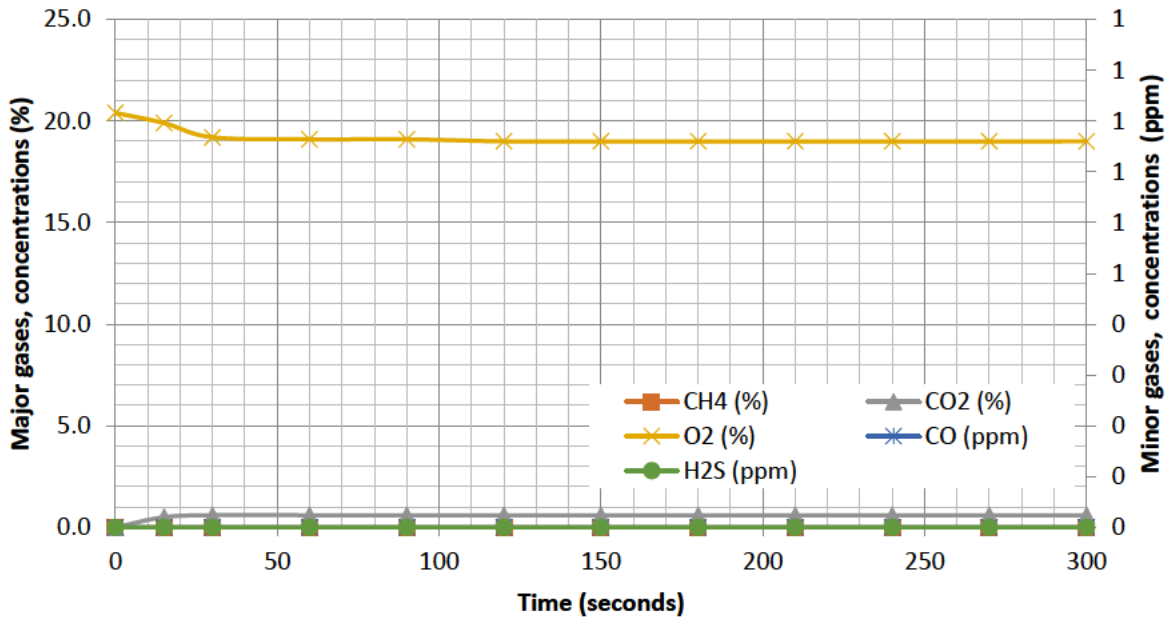
WS5		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.3	0	0
Hole ID		00:15	0.0	0.0	0.3	20.3	0	0
VOC peak (ppm)	0.1	00:30	-0.1	0.0	0.4	20.2	0	0
		01:00	0.0	0.0	0.4	20.2	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.4	20.2	0	0
		02:00	0.0	0.0	0.4	20.2	0	0
Borehole Depth (mbgl)	1.8	02:30	0.0	0.0	0.4	20.2	0	0
		03:00	0.0	0.0	0.4	20.2	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.4	20.2	0	0
		04:00	0.0	0.0	0.4	20.2	0	0
Borehole Pressure (mb)	1.0	04:30	0.0	0.0	0.4	20.2	0	0
		05:00	0.0	0.0	0.4	20.2	0	0
Peak flow (ʃ/h)	0.1							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	11				
Site	Duckmoor	Ambient Pressure (mb)		1025			

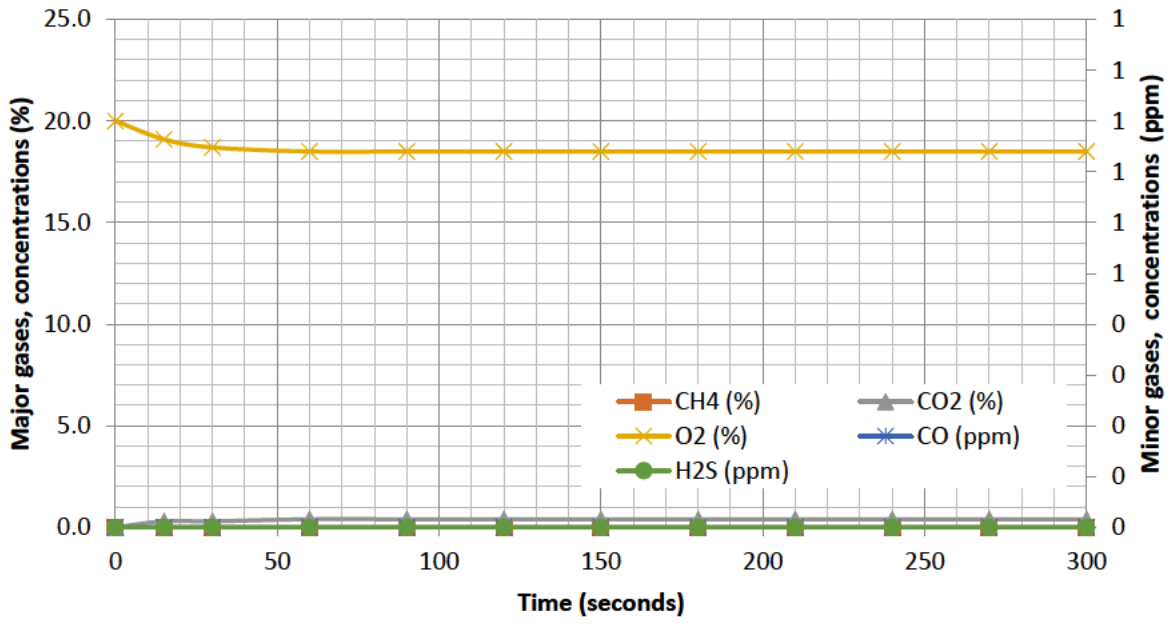
WS6		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.4	0	0
Hole ID		00:15	0.0	0.0	0.5	19.9	0	0
VOC peak (ppm)	0.1	00:30	0.1	0.0	0.6	19.2	0	0
		01:00	0.2	0.0	0.6	19.1	0	0
VOC steady (ppm)	0.0	01:30	0.3	0.0	0.6	19.1	0	0
		02:00	0.3	0.0	0.6	19.0	0	0
Borehole Depth (mbgl)	2.8	02:30	0.4	0.0	0.6	19.0	0	0
		03:00	0.4	0.0	0.6	19.0	0	0
Water level (mbgl)	Dry	03:30	0.5	0.0	0.6	19.0	0	0
		04:00	0.5	0.0	0.6	19.0	0	0
Borehole Pressure (mb)	3.0	04:30	0.5	0.0	0.6	19.0	0	0
		05:00	0.6	0.0	0.6	19.0	0	0
Peak flow (ʃ/h)	0.6							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)	1026				

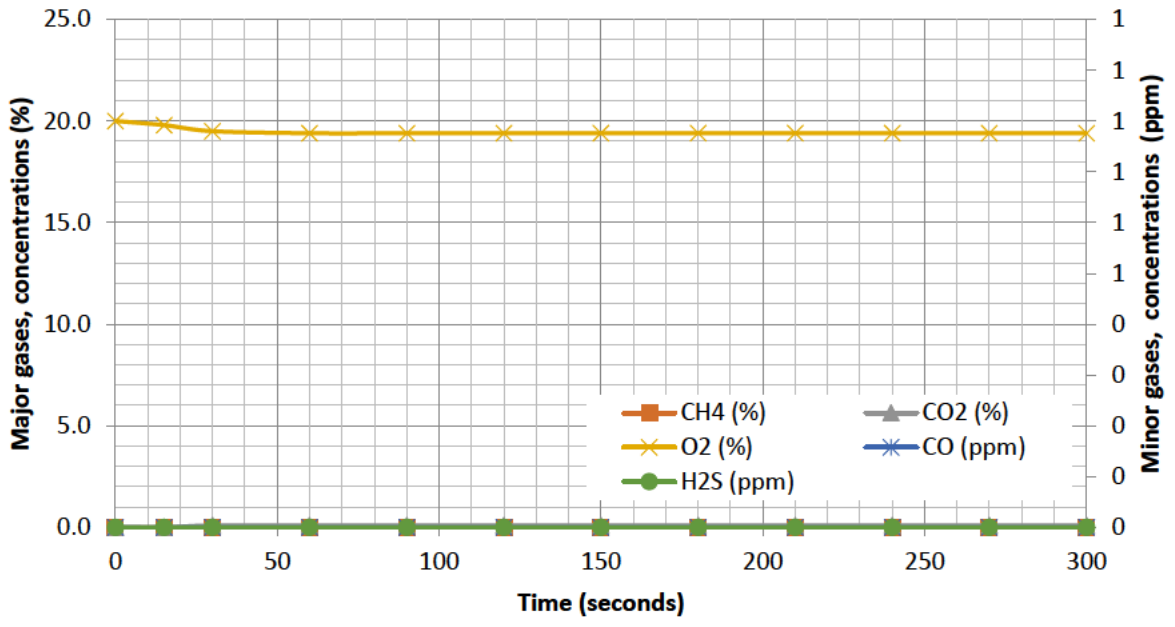
WS1		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.0	0	0
Hole ID		00:15	0.1	0.0	0.3	19.1	0	0
VOC peak (ppm)	0.0	00:30	0.1	0.0	0.3	18.7	0	0
		01:00	0.2	0.0	0.4	18.5	0	0
VOC steady (ppm)	0.0	01:30	0.2	0.0	0.4	18.5	0	0
		02:00	0.2	0.0	0.4	18.5	0	0
Borehole Depth (mbgl)	3.80	02:30	0.3	0.0	0.4	18.5	0	0
		03:00	0.3	0.0	0.4	18.5	0	0
Water level (mbgl)	2.40	03:30	0.4	0.0	0.4	18.5	0	0
		04:00	0.4	0.0	0.4	18.5	0	0
Borehole Pressure (mb)	4.0	04:30	0.5	0.0	0.4	18.5	0	0
		05:00	0.5	0.0	0.4	18.5	0	0
Peak flow (ʃ/h)	0.6							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	6				
Site	Duckmoor	Ambient Pressure (mb)		1026			

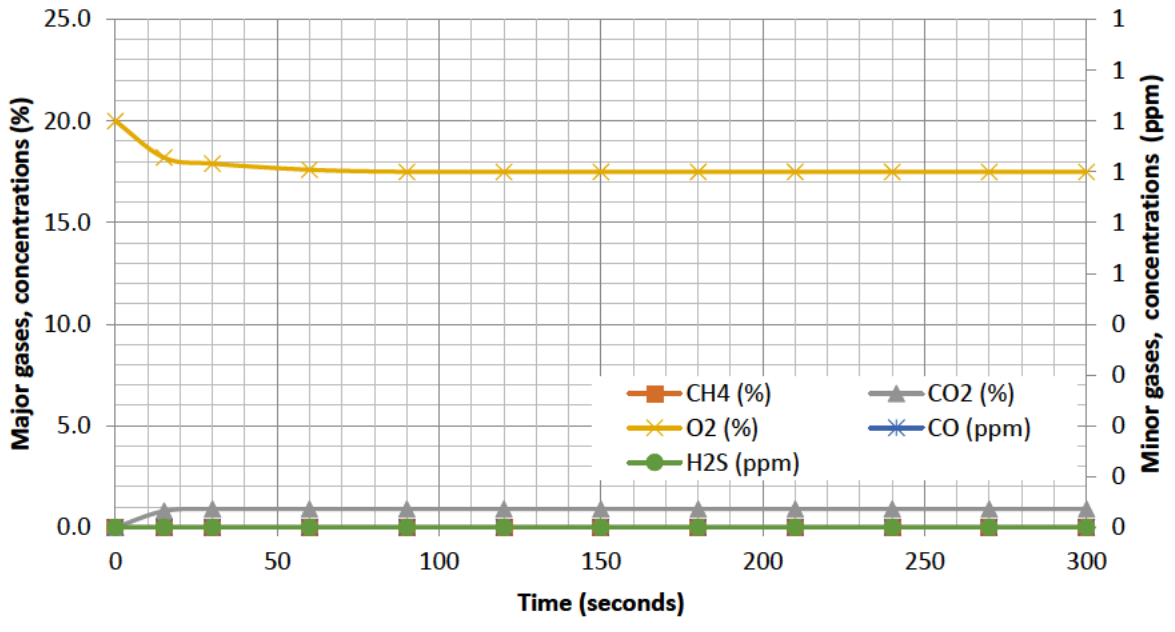
WS2		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	-0.7	0.0	0.0	20.0	0	0
Hole ID		00:15	-0.1	0.0	0.0	19.8	0	0
VOC peak (ppm)	0.0	00:30	0.1	0.0	0.1	19.5	0	0
		01:00	0.1	0.0	0.1	19.4	0	0
VOC steady (ppm)	0.0	01:30	0.1	0.0	0.1	19.4	0	0
		02:00	0.1	0.0	0.1	19.4	0	0
Borehole Depth (mbgl)	2.82	02:30	0.1	0.0	0.1	19.4	0	0
		03:00	0.1	0.0	0.1	19.4	0	0
Water level (mbgl)	0.60	03:30	0.1	0.0	0.1	19.4	0	0
		04:00	0.1	0.0	0.1	19.4	0	0
Borehole Pressure (mb)	1.0	04:30	0.1	0.0	0.1	19.4	0	0
		05:00	0.1	0.0	0.1	19.4	0	0
Peak flow (ʃ/h)	0.2							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1027				

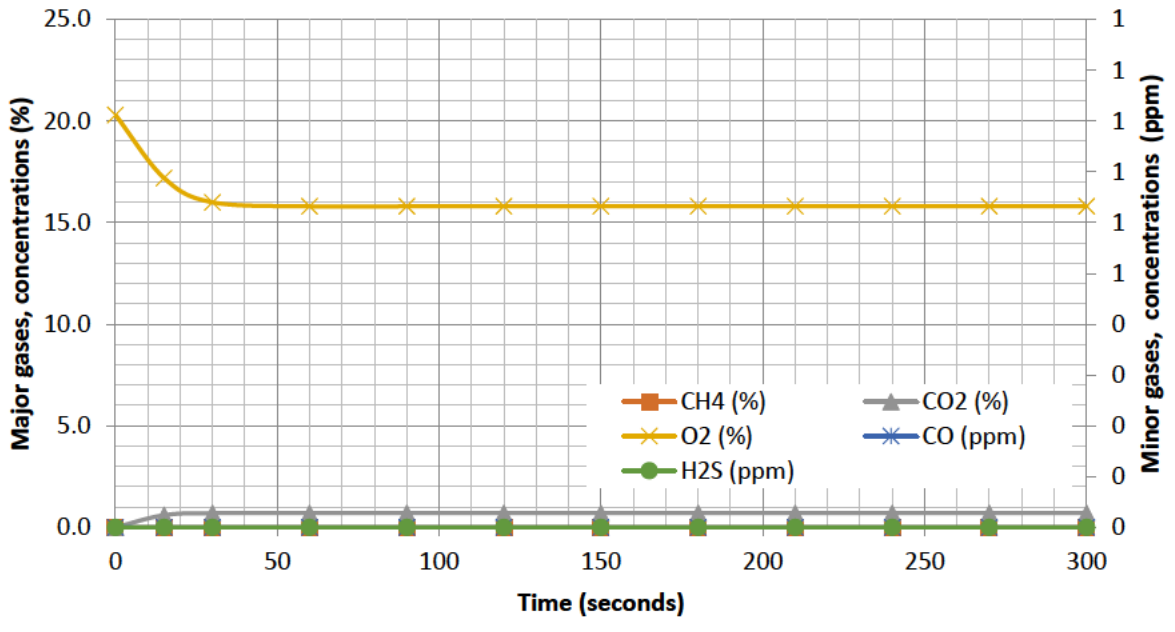
WS3		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.0	0	0
Hole ID		00:15	0.0	0.0	0.8	18.2	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.9	17.9	0	0
		01:00	0.0	0.0	0.9	17.6	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.9	17.5	0	0
		02:00	0.0	0.0	0.9	17.5	0	0
Borehole Depth (mbgl)	1.90	02:30	0.0	0.0	0.9	17.5	0	0
		03:00	0.0	0.0	0.9	17.5	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.9	17.5	0	0
		04:00	0.0	0.0	0.9	17.5	0	0
Borehole Pressure (mb)	1	04:30	0.0	0.0	0.9	17.5	0	0
		05:00	0.0	0.0	0.9	17.5	0	0
Peak flow (ʃ/h)	0							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	5				
Site	Duckmoor	Ambient Pressure (mb)	1028				

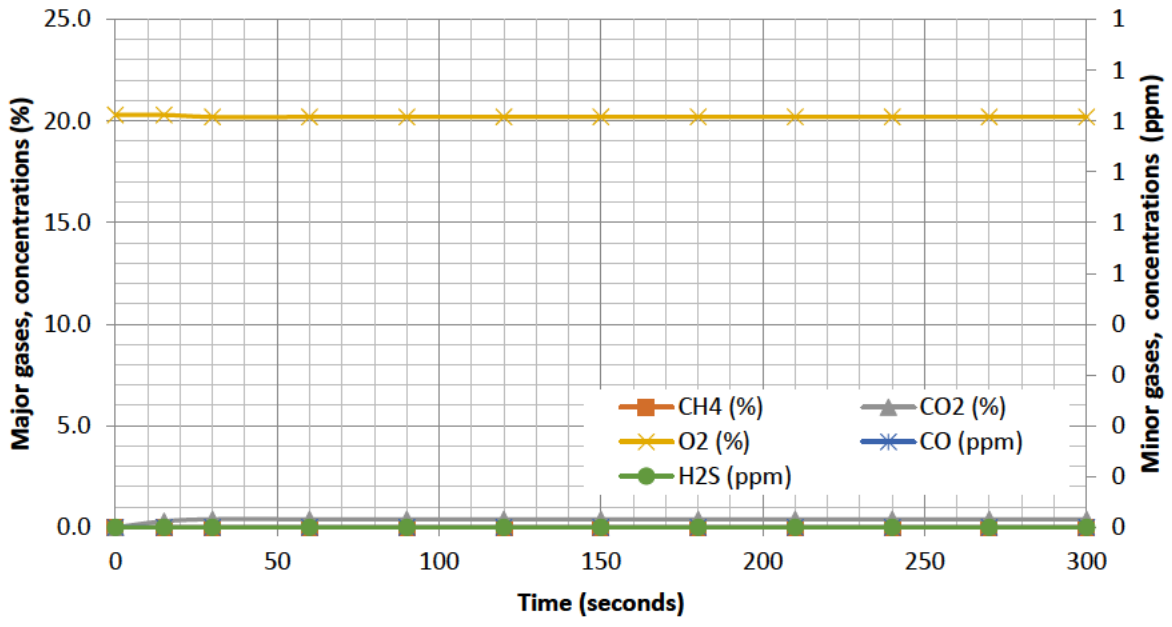
WS4		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.3	0	0
Hole ID		00:15	0.0	0.0	0.6	17.2	0	0
VOC peak (ppm)	0.1	00:30	0.0	0.0	0.7	16.0	0	0
		01:00	0.1	0.0	0.7	15.8	0	0
VOC steady (ppm)	0.0	01:30	0.1	0.0	0.7	15.8	0	0
		02:00	0.2	0.0	0.7	15.8	0	0
Borehole Depth (mbgl)	3.90	02:30	0.2	0.0	0.7	15.8	0	0
		03:00	0.3	0.0	0.7	15.8	0	0
Water level (mbgl)	Dry	03:30	0.3	0.0	0.7	15.8	0	0
		04:00	0.3	0.0	0.7	15.8	0	0
Borehole Pressure (mb)	5.0	04:30	0.4	0.0	0.7	15.8	0	0
		05:00	0.4	0.0	0.7	15.8	0	0
Peak flow (ʃ/h)	0.4							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	11				
Site	Duckmoor	Ambient Pressure (mb)	1027				

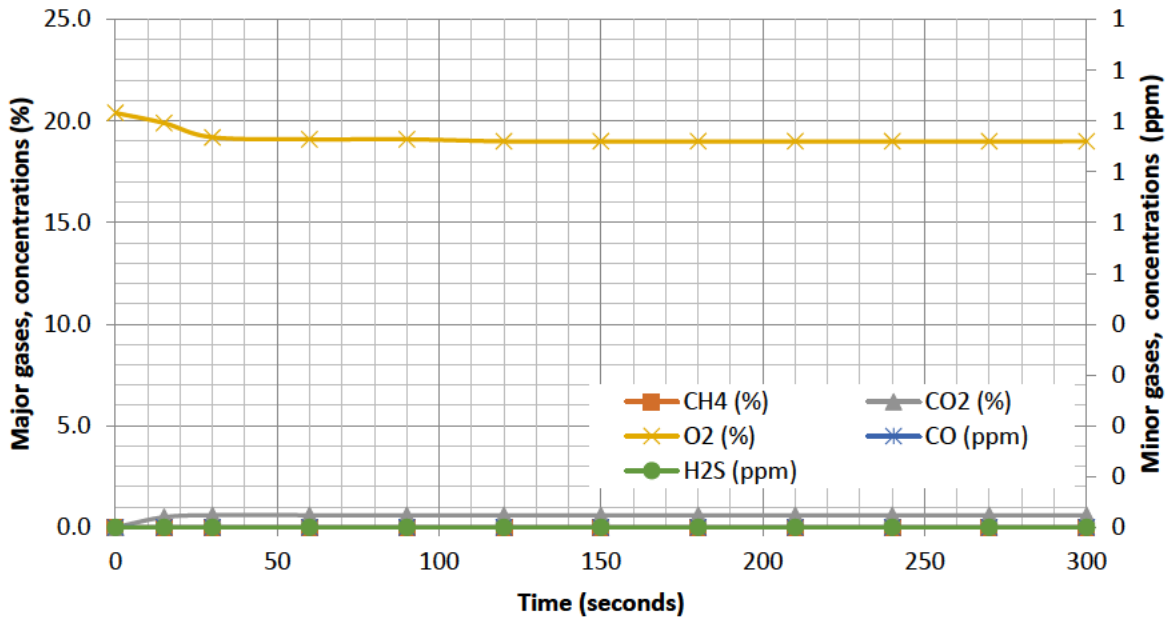
WS5		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.3	0	0
Hole ID		00:15	0.0	0.0	0.3	20.3	0	0
VOC peak (ppm)	0.1	00:30	-0.1	0.0	0.4	20.2	0	0
		01:00	0.0	0.0	0.4	20.2	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.4	20.2	0	0
		02:00	0.0	0.0	0.4	20.2	0	0
Borehole Depth (mbgl)	1.84	02:30	0.0	0.0	0.4	20.2	0	0
		03:00	0.0	0.0	0.4	20.2	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.4	20.2	0	0
		04:00	0.0	0.0	0.4	20.2	0	0
Borehole Pressure (mb)	1.0	04:30	0.0	0.0	0.4	20.2	0	0
		05:00	0.0	0.0	0.4	20.2	0	0
Peak flow (ʃ/h)	0.1							



Continuous Gas Monitoring Record

Date	04/03/2025	Engineer	RP				
Project No	3750859	Temp °C	11				
Site	Duckmoor	Ambient Pressure (mb)	1025				

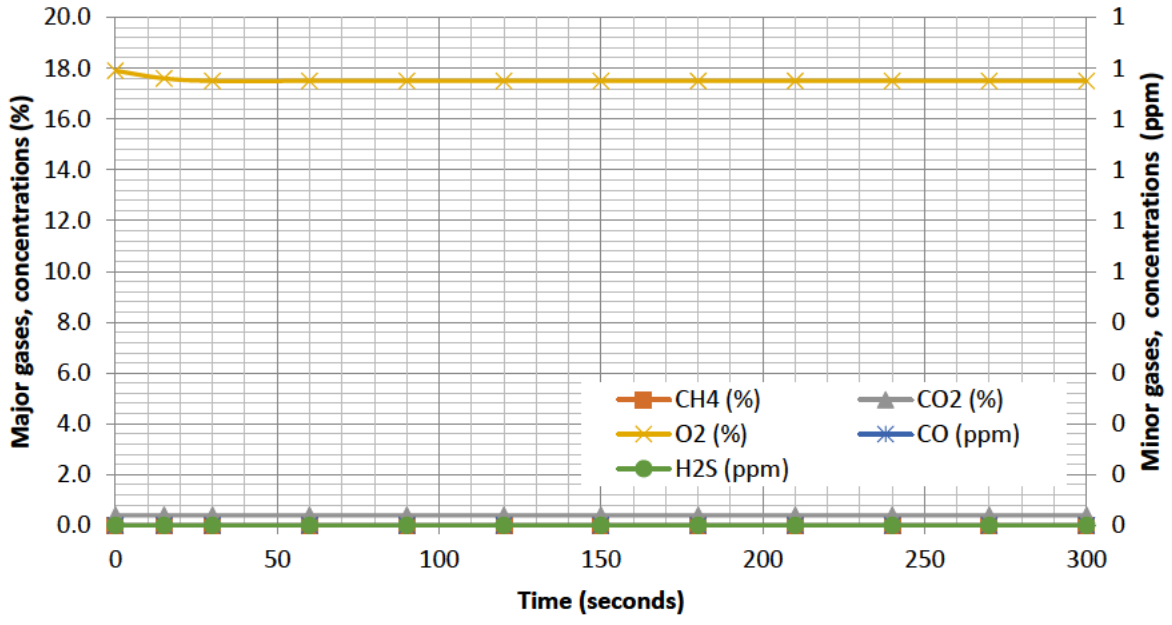
WS6		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.0	20.4	0	0
Hole ID		00:15	0.0	0.0	0.5	19.9	0	0
VOC peak (ppm)	0.1	00:30	0.1	0.0	0.6	19.2	0	0
		01:00	0.2	0.0	0.6	19.1	0	0
VOC steady (ppm)	0.0	01:30	0.3	0.0	0.6	19.1	0	0
		02:00	0.3	0.0	0.6	19.0	0	0
Borehole Depth (mbgl)	2.78	02:30	0.4	0.0	0.6	19.0	0	0
		03:00	0.4	0.0	0.6	19.0	0	0
Water level (mbgl)	Dry	03:30	0.5	0.0	0.6	19.0	0	0
		04:00	0.5	0.0	0.6	19.0	0	0
Borehole Pressure (mb)	3.0	04:30	0.5	0.0	0.6	19.0	0	0
		05:00	0.6	0.0	0.6	19.0	0	0
Peak flow (ʃ/h)	0.6							



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1000				

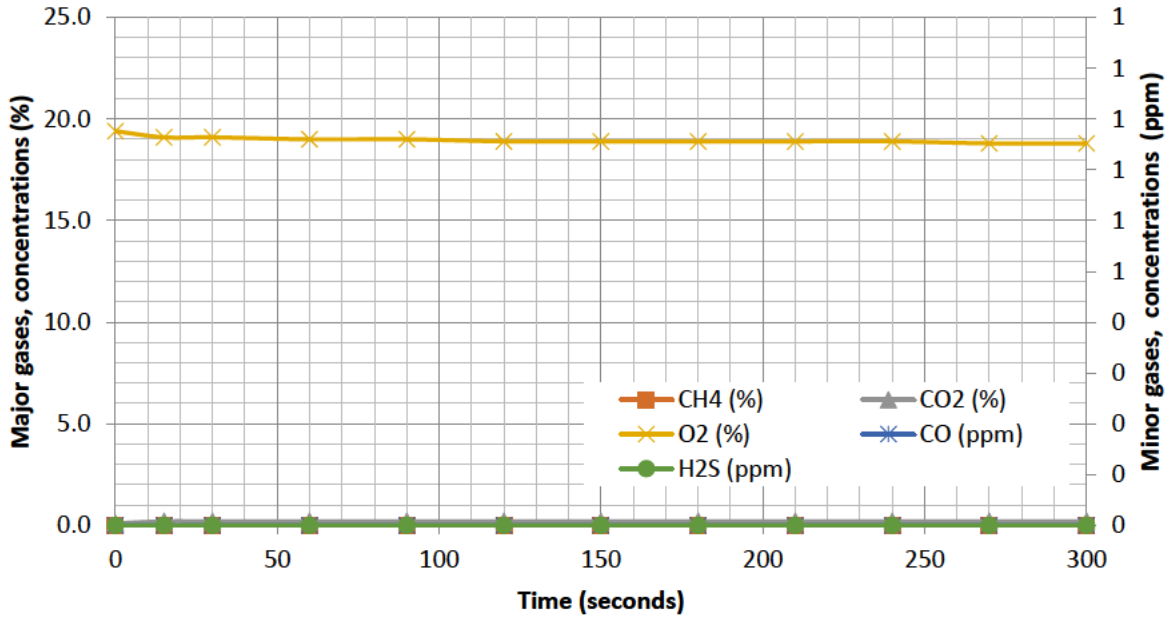
WS1		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.4	17.9	0	0
Hole ID		00:15	0.0	0.0	0.4	17.6	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.4	17.5	0	0
		01:00	0.0	0.0	0.4	17.5	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.4	17.5	0	0
		02:00	0.0	0.0	0.4	17.5	0	0
Borehole Depth (mbgl)	3.82	02:30	0.0	0.0	0.4	17.5	0	0
		03:00	0.0	0.0	0.4	17.5	0	0
Water level (mbgl)	2.30	03:30	0.0	0.0	0.4	17.5	0	0
		04:00	0.0	0.0	0.4	17.5	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	0.0	0.4	17.5	0	0
		05:00	0.0	0.0	0.4	17.5	0	0
Peak flow (ʃ/h)	0.0	Weather during visit was cool, over cast with occassional droplets of rain, with occassional gusty winds.						



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1001				

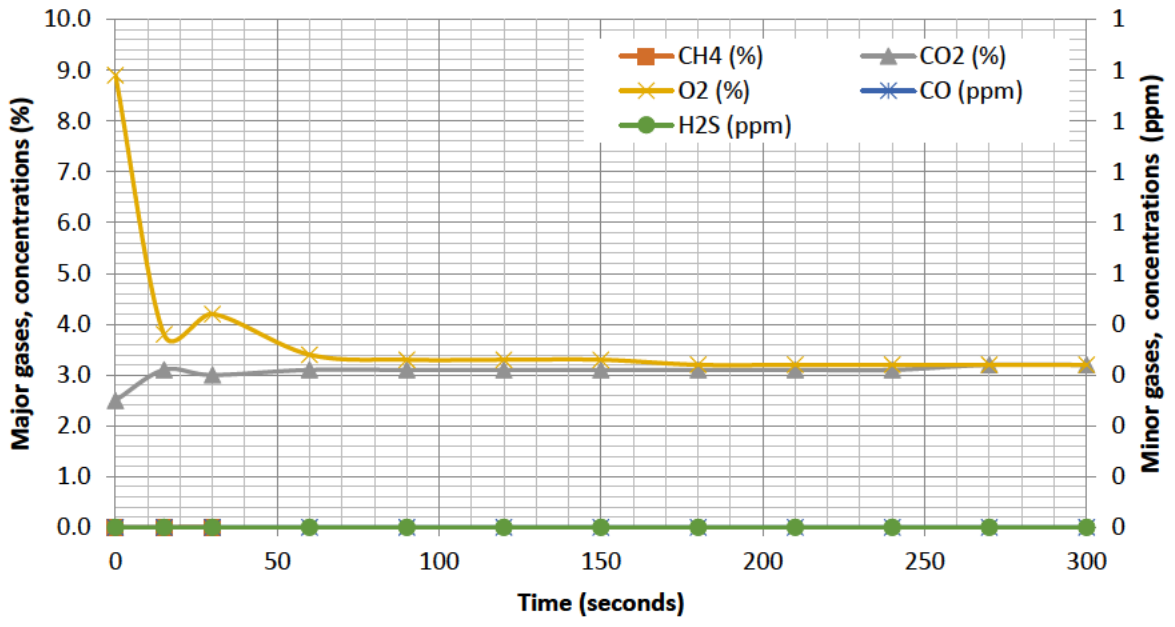
WS2		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	-0.7	0.0	0.1	19.4	0	0
Hole ID		00:15	-0.5	0.0	0.2	19.1	0	0
VOC peak (ppm)	0.1	00:30	-0.5	0.0	0.2	19.1	0	0
		01:00	-0.5	0.0	0.2	19.0	0	0
VOC steady (ppm)	0.1	01:30	-0.5	0.0	0.2	19.0	0	0
		02:00	-0.5	0.0	0.2	18.9	0	0
Borehole Depth (mbgl)	2.95	02:30	-0.5	0.0	0.2	18.9	0	0
		03:00	-0.5	0.0	0.2	18.9	0	0
Water level (mbgl)	0.62	03:30	-0.5	0.0	0.2	18.9	0	0
		04:00	-0.5	0.0	0.2	18.9	0	0
Borehole Pressure (mb)	0.0	04:30	-0.5	0.0	0.2	18.8	0	0
		05:00	-0.5	0.0	0.2	18.8	0	0
Peak flow (ʃ/h)	-0.5	After completion of the gas monitoring, the bung was difficult to remove for water level monitoring. The gas tap was opened and a hiss was audible for 5 seconds, after which, the bung was easily removed.						



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1002				

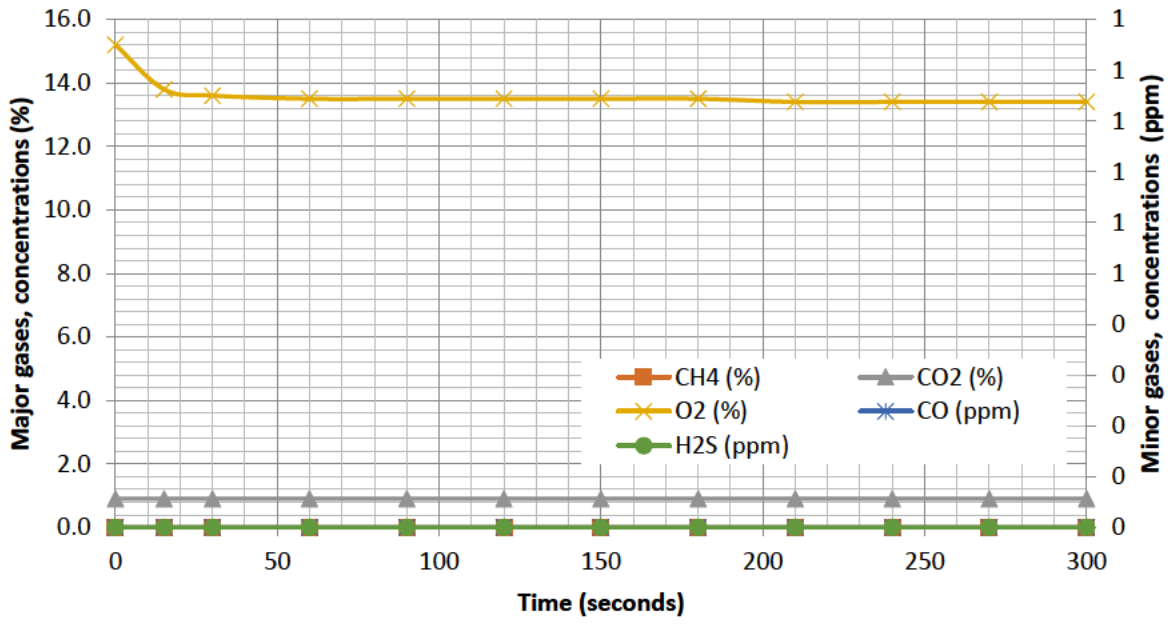
WS3		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	2.5	8.9	0	0
Hole ID		00:15	0.0	0.0	3.1	3.8	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	3.0	4.2	0	0
		01:00	0.0	-0.1	3.1	3.4	0	0
VOC steady (ppm)	0.0	01:30	0.0	-0.1	3.1	3.3	0	0
		02:00	0.0	-0.1	3.1	3.3	0	0
Borehole Depth (mbgl)	3.0	02:30	0.0	-0.1	3.1	3.3	0	0
		03:00	0.0	-0.1	3.1	3.2	0	0
Water level (mbgl)	Dry	03:30	0.0	-0.1	3.1	3.2	0	0
		04:00	0.0	-0.1	3.1	3.2	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	-0.1	3.2	3.2	0	0
		05:00	0.0	-0.1	3.2	3.2	0	0
Peak flow (ʃ/h)	0.0							



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1000				

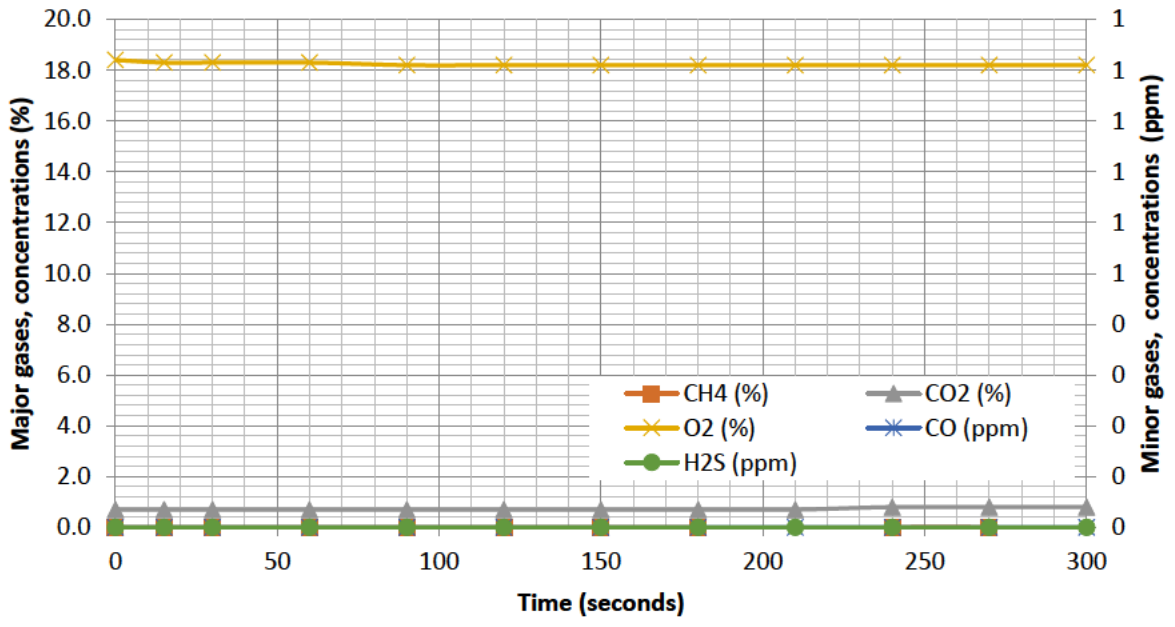
WS4		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.9	15.2	0	0
Hole ID		00:15	0.0	0.0	0.9	13.8	0	0
VOC peak (ppm)	0.1	00:30	0.0	0.0	0.9	13.6	0	0
		01:00	0.0	0.0	0.9	13.5	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.9	13.5	0	0
		02:00	0.0	0.0	0.9	13.5	0	0
Borehole Depth (mbgl)	3.9	02:30	0.0	0.0	0.9	13.5	0	0
		03:00	0.0	0.0	0.9	13.5	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.9	13.4	0	0
		04:00	0.0	0.0	0.9	13.4	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	0.0	0.9	13.4	0	0
		05:00	0.0	0.0	0.9	13.4	0	0
Peak flow (ʃ/h)	0.0							



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1000				

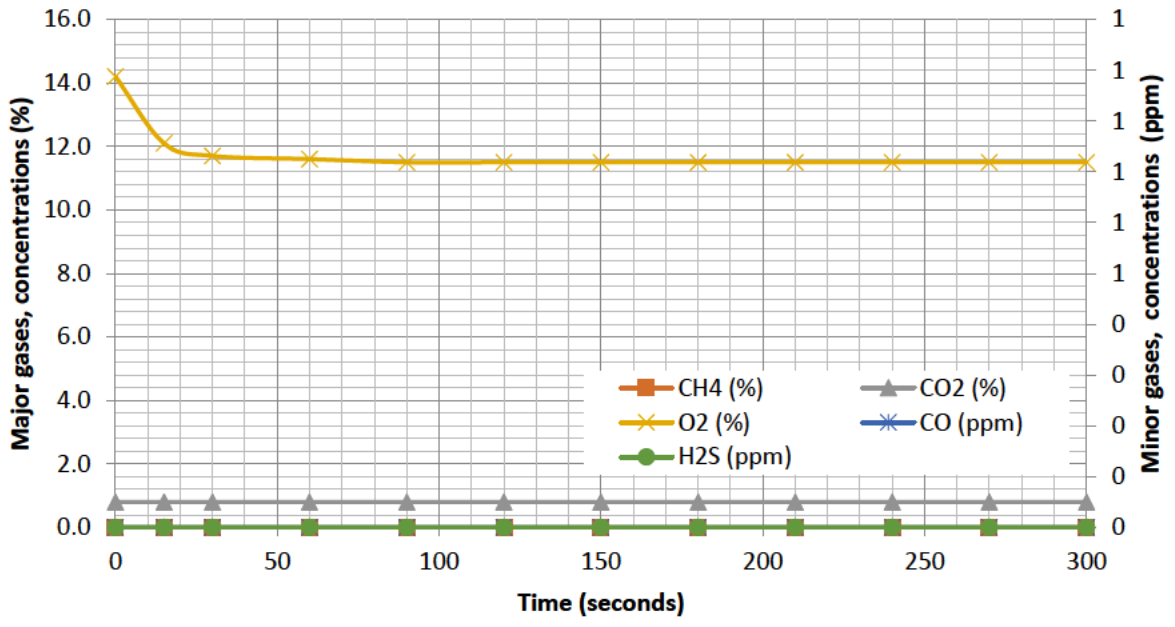
WS5		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.7	18.4	0	0
Hole ID		00:15	0.0	0.0	0.7	18.3	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.7	18.3	0	0
		01:00	0.0	0.0	0.7	18.3	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.7	18.2	0	0
		02:00	0.0	0.0	0.7	18.2	0	0
Borehole Depth (mbgl)	2.8	02:30	0.0	0.0	0.7	18.2	0	0
		03:00	0.0	0.0	0.7	18.2	0	0
Water level (mbgl)	Dry	03:30	0.0	-0.1	0.7	18.2	0	0
		04:00	0.0	0.0	0.8	18.2	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	0.0	0.8	18.2	0	0
		05:00	0.0	-0.1	0.8	18.2	0	0
Peak flow (ʃ/h)	0.0							



Continuous Gas Monitoring Record

Date	13/03/2025	Engineer	SH				
Project No	3750859	Temp °C	4				
Site	Duckmoor	Ambient Pressure (mb)	1001				

WS6		Time	Flow (ʃ/h)	CH^4 (%)	CO^2 (%)	O^2 (%)	CO (ppm)	H^2S (ppm)
		00:00	0.0	0.0	0.8	14.2	0	0
Hole ID		00:15	0.0	0.0	0.8	12.1	0	0
VOC peak (ppm)	0.0	00:30	0.0	0.0	0.8	11.7	0	0
		01:00	0.0	0.0	0.8	11.6	0	0
VOC steady (ppm)	0.0	01:30	0.0	0.0	0.8	11.5	0	0
		02:00	0.0	0.0	0.8	11.5	0	0
Borehole Depth (mbgl)	1.9	02:30	0.0	0.0	0.8	11.5	0	0
		03:00	0.0	0.0	0.8	11.5	0	0
Water level (mbgl)	Dry	03:30	0.0	0.0	0.8	11.5	0	0
		04:00	0.0	0.0	0.8	11.5	0	0
Borehole Pressure (mb)	0.0	04:30	0.0	0.0	0.8	11.5	0	0
		05:00	0.0	0.0	0.8	11.5	0	0
Peak flow (ʃ/h)	0.0							



APPENDIX F – GEOTECHNICAL LABORATORY TEST RESULTS

ANALYTICAL TEST REPORT

Report Number	25-02070, issue number 1
Contract name:	Duckmoor, Billingshurst
Client reference:	3750859
Clients name:	K4 Soils Laboratory Ltd
Clients address:	K4 Soils, Watford Unit 8 Olds Close Watford Hertfordshire WD18 9RU
Samples received:	04/03/2025
Analysis started:	04/03/2025
Analysis completed:	06/03/2025
Report issued:	06/03/2025

Key	U UKAS accredited test M MCERTS & UKAS accredited test $ Test carried out by an approved subcontractor I/S Insufficient sample to carry out test U/S Sample not suitable for testing NAD No Asbestos Detected
Approved by:	Georgia Hunter Reporting Administrator

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
38369	TP1	1.80	Brown Clay with Gravel and Vegetation.	-	-	13.2
38370	TP15	2.60	Brown Clay with Gravel and Vegetation.	-	-	11.6
38371	WS5	0.90	Brown Clay with Gravel and Vegetation.	-	-	15.2

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

a	Sampling date not provided
b	Sampling time not provided (waters only)
c	Sample not received in appropriate containers
d	Storage Temperature
e	Headspace present in sample container
f	Sample exceeded sampling to reciept
g	Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
38369	TP1	1.80	N	
38370	TP15	2.60	N	
38371	WS5	0.90	N	

SOILS

Lab Number					38369	38370	38371
Client Reference					1	2	3
Sample ID					TP1	TP15	WS5
Depth (m)					1.80	2.60	0.90
Sampling Date					19/02/2025	19/02/2025	19/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**			
Metals							
Water Soluble Sulphate	CE061	M	0.01	g/l	2.14	0.914	0.082
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	1.95	0.15	0.03
Sulphur %	CE264	N	0.0032	%	0.834	0.0547	0.0217
Combustion							
Moisture Content	CE001	N	0.1	%	13.2	11.6	15.2
Wet Chem							
pH	CE004	M	0.1	pH units	8.2	9.1	8.4

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE061	W. Sol Metals	ICPOES	Air dried sample
CE004	pH of Solids	Potentiometric	As submitted sample
CE062	Acid Soluble Sulphate in Solids	HCl Extract and ICPOES	Air dried sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample

REPORT INFORMATION

Report No.:25-02070, issue number 1

Key	
U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

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

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

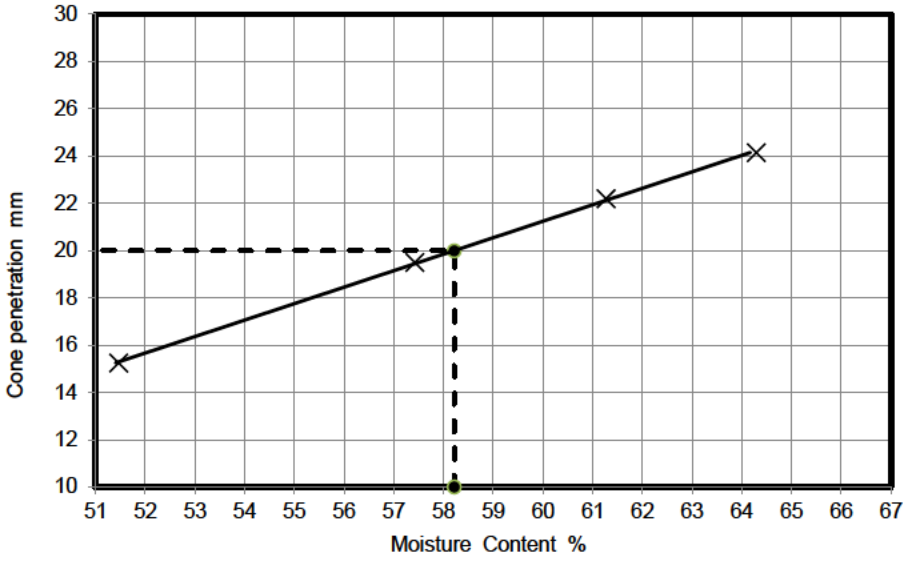
Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP2
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	1.00 m
Soil Description	Brown mottled grey silty CLAY with traces of fine rootlets			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

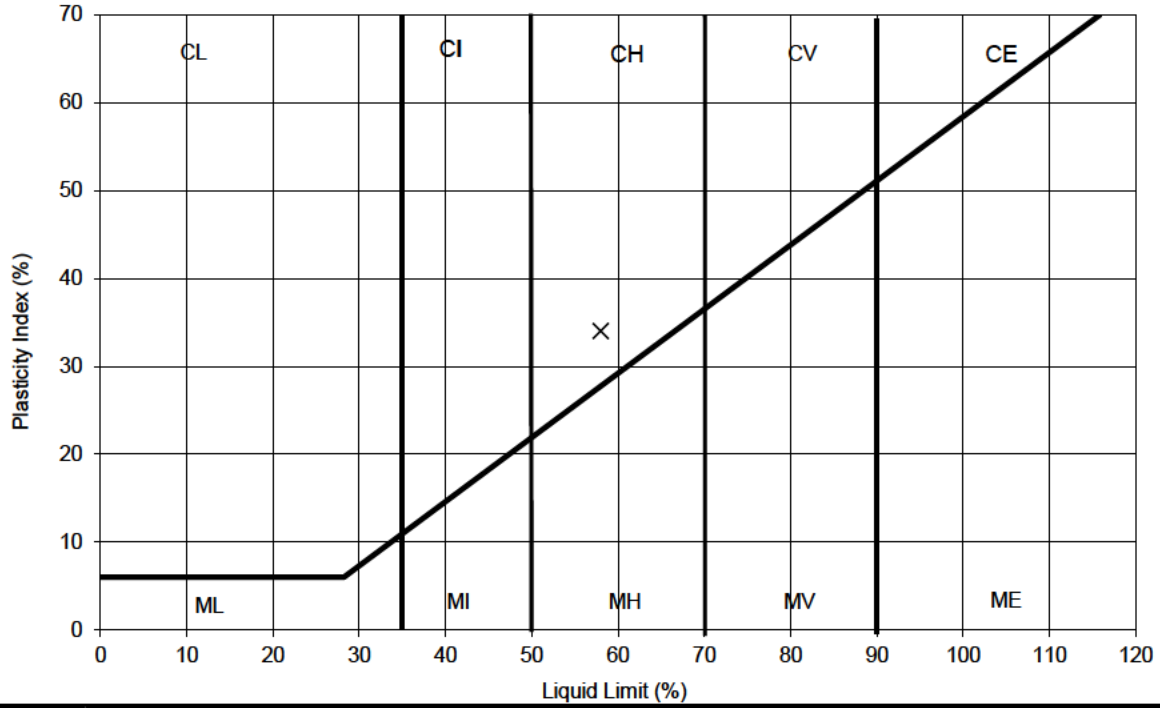


WATER CONTENT	25.7	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	58	%
PLASTIC LIMIT	24	%
PLASTICITY INDEX	34	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory

Checked and Approved

Initials: J.P

Date: 11/03/2025

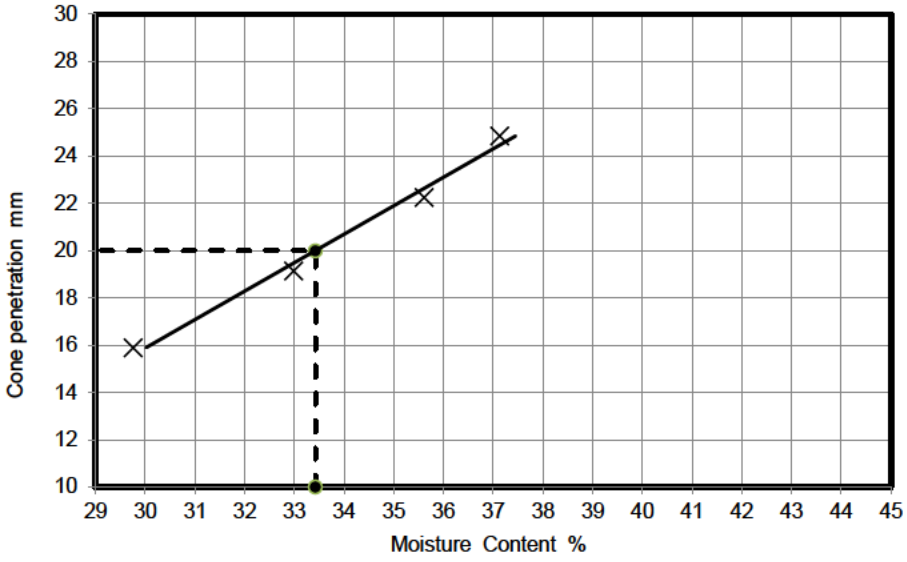
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP6
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	0.80 m
Soil Description	Brown mottled bluish grey slightly sandy silty CLAY			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

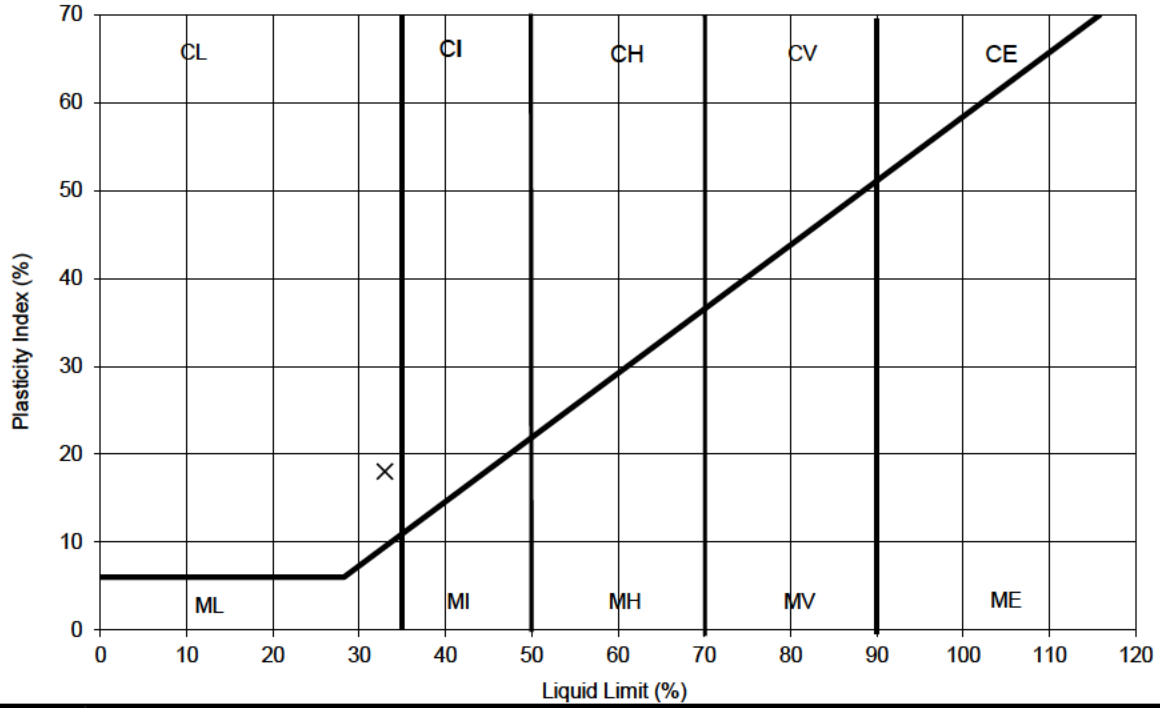


WATER CONTENT	15.4	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	33	%
PLASTIC LIMIT	15	%
PLASTICITY INDEX	18	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Checked and Approved

Initials: J.P

Date: 11/03/2025

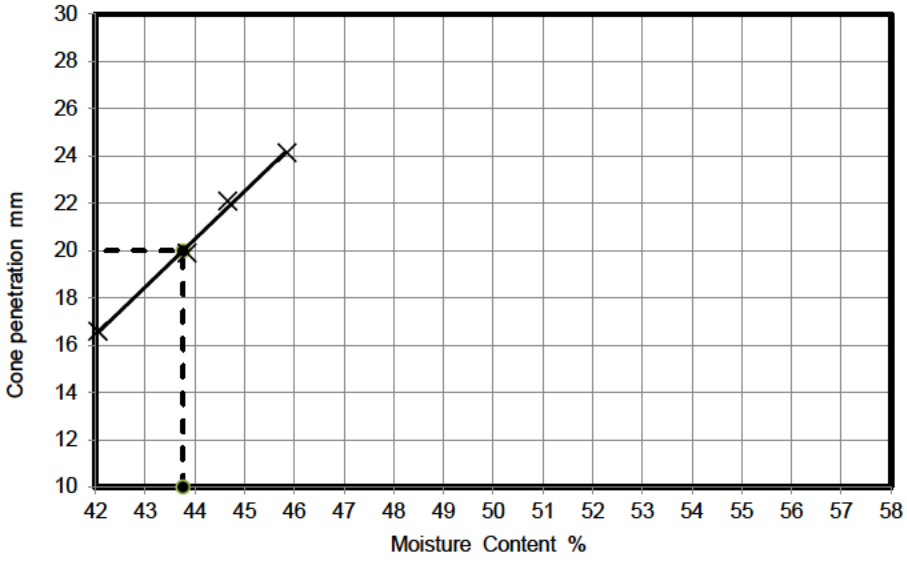
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP7
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	1.80 m
Soil Description	Brown mottled light bluish grey silty CLAY with orange brown sandy patches and traces of fine rootlets			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

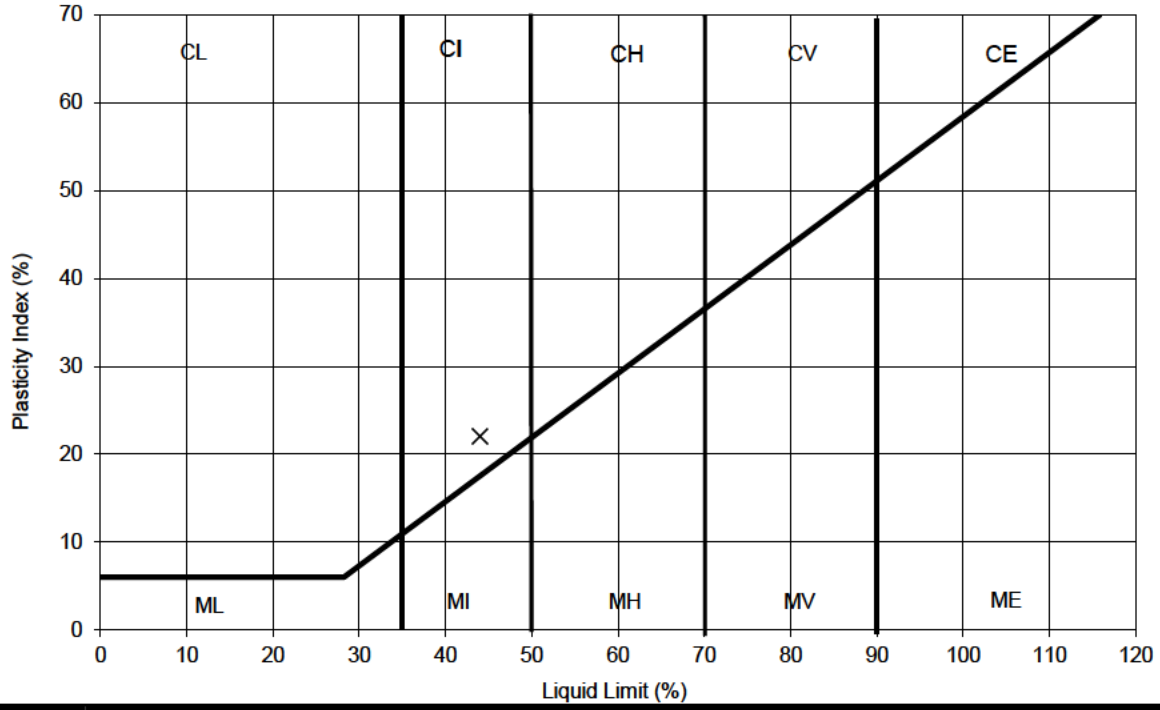


WATER CONTENT	20.1	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	44	%
PLASTIC LIMIT	22	%
PLASTICITY INDEX	22	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Initials: J.P

Date: 11/03/2025

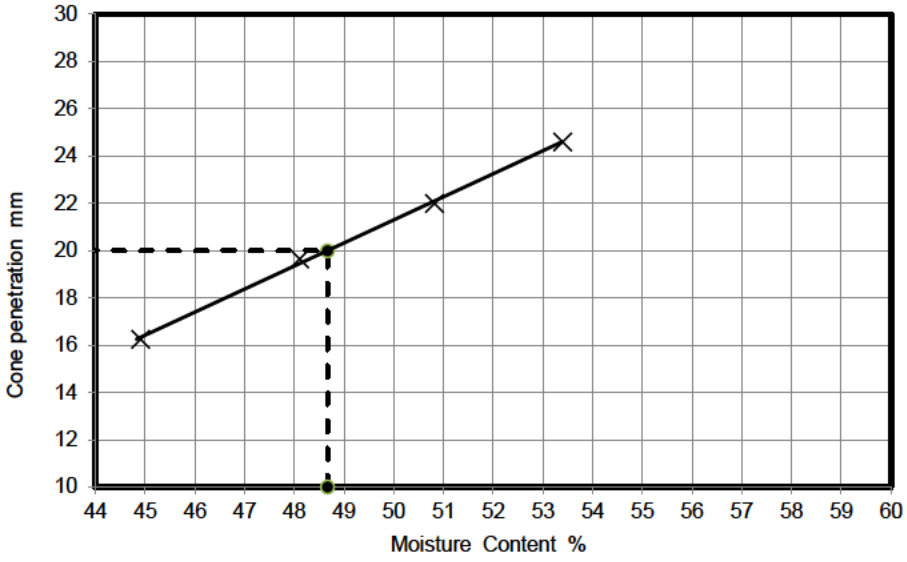
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP11
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	0.80 m
Soil Description	Reddish brown slightly mottled grey silty CLAY			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

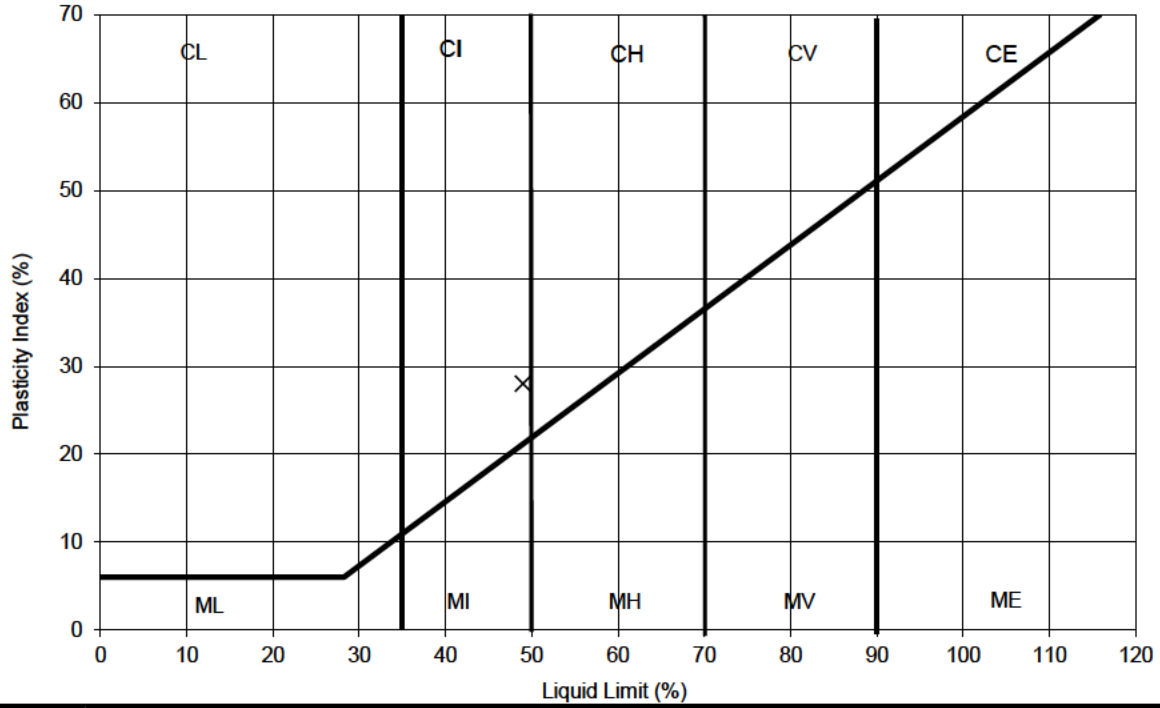


WATER CONTENT	19.4	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	49	%
PLASTIC LIMIT	21	%
PLASTICITY INDEX	28	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

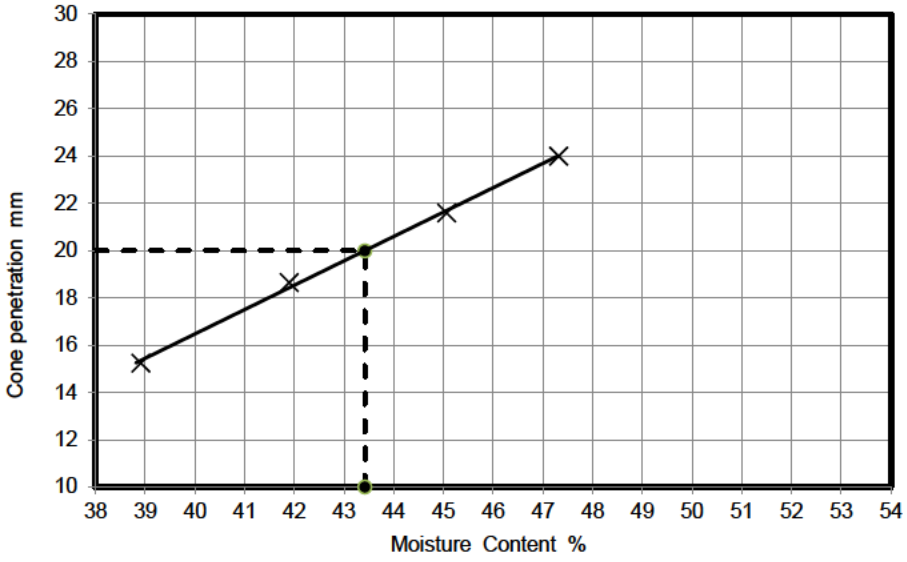
Checked and Approved

Initials: J.P

Date: 11/03/2025

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP18
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	0.80 m
Soil Description	Light bluish grey mottled brown silty CLAY			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

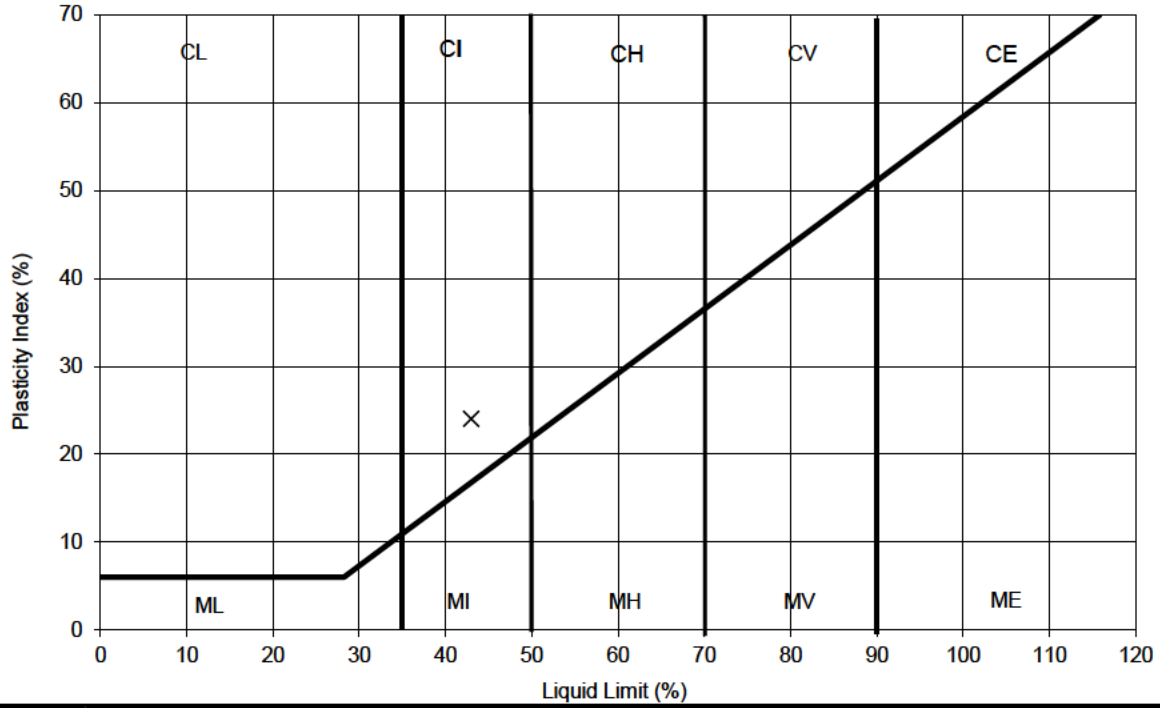


WATER CONTENT	21.2	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	43	%
PLASTIC LIMIT	19	%
PLASTICITY INDEX	24	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Checked and Approved

Initials: J.P

Date: 11/03/2025

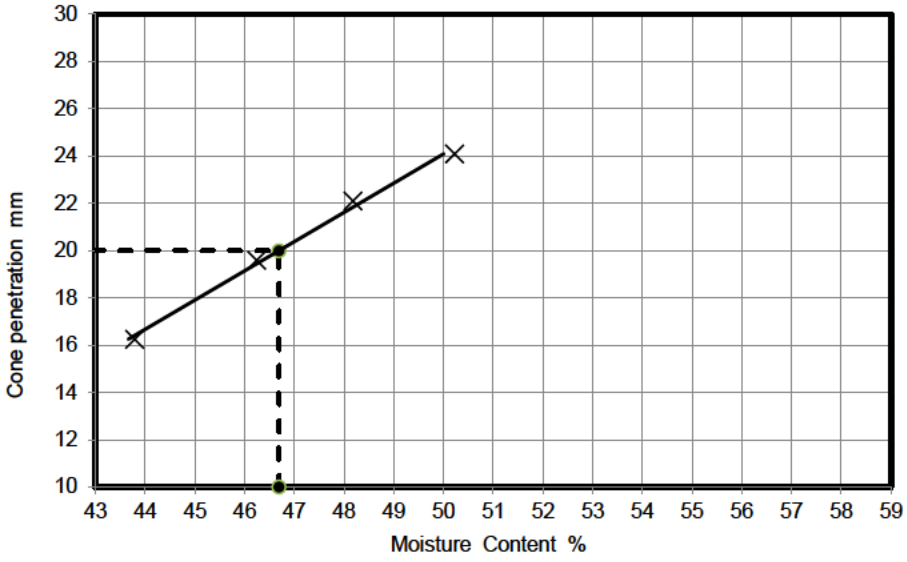
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP19
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	1.50 m
Soil Description	Dark reddish brown slightly mottled grey slightly fine sandy silty CLAY			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

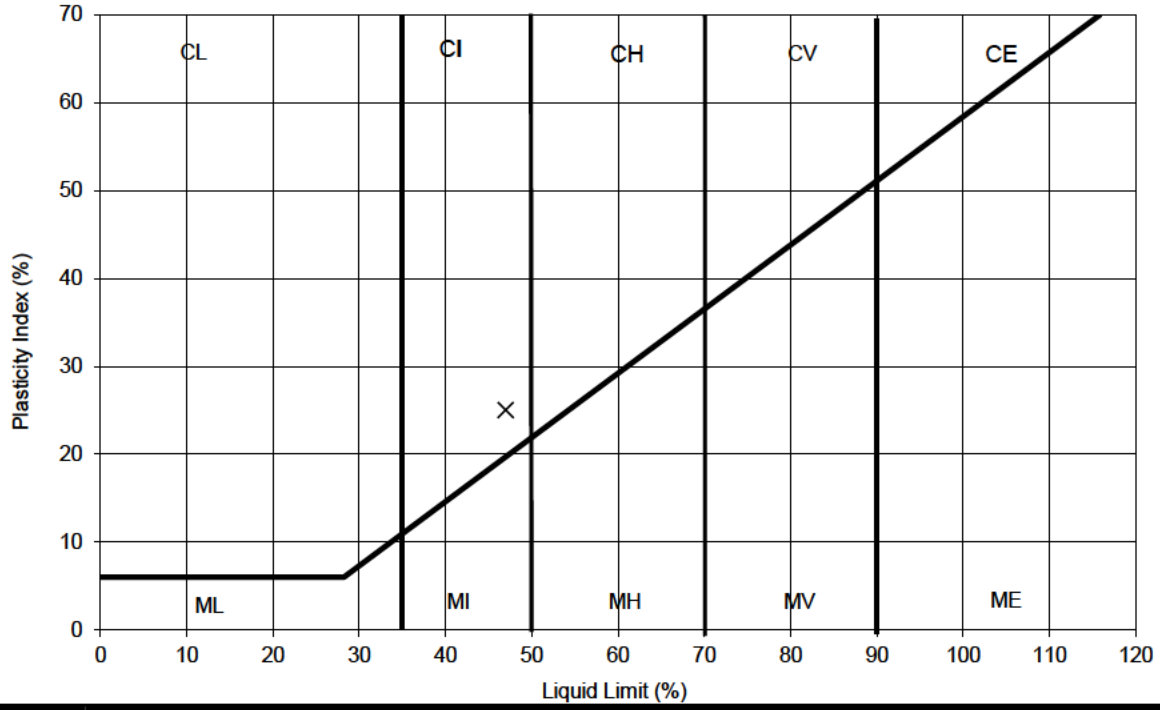


WATER CONTENT	19.1	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	47	%
PLASTIC LIMIT	22	%
PLASTICITY INDEX	25	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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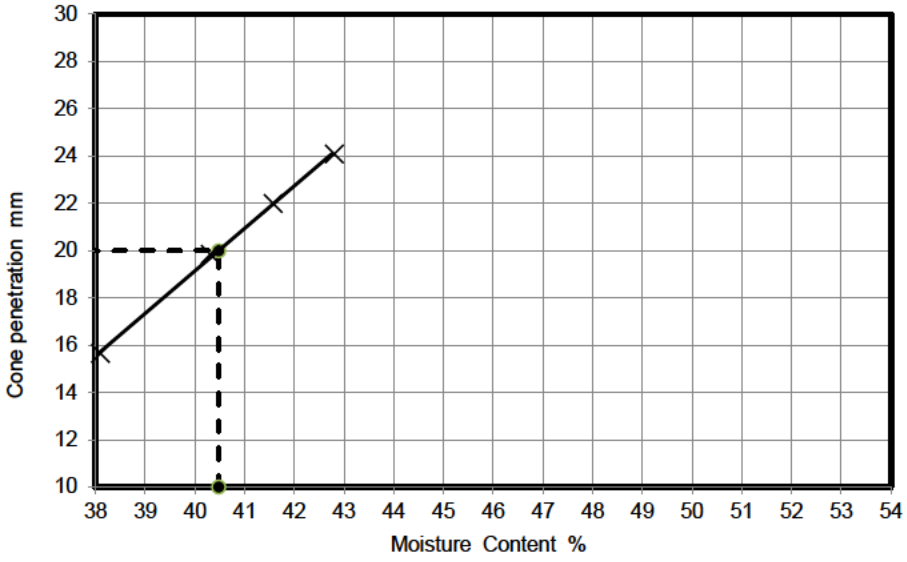
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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	TP20
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	2.50 m
Soil Description	Dark reddish brown slightly mottled brown and light grey slightly fine sandy very silty CLAY			Depth Base	- m
				Sample Type	B
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

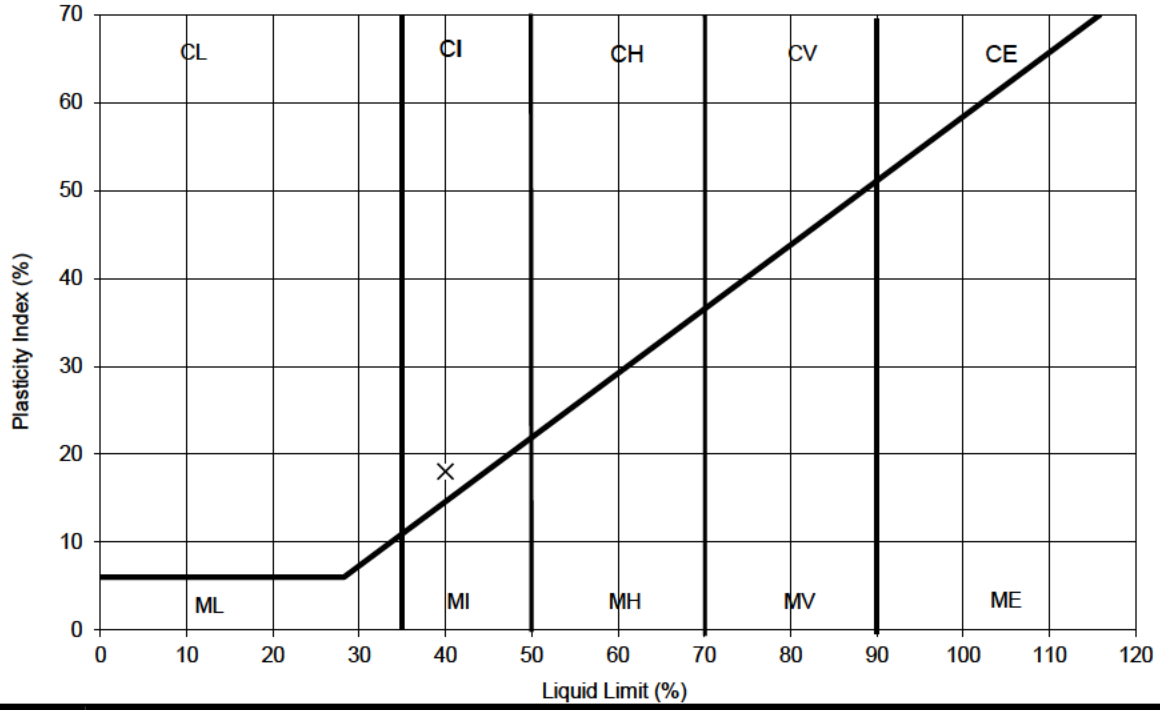


WATER CONTENT	**20.3**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**40**	**%**
PLASTIC LIMIT	**22**	**%**
PLASTICITY INDEX	**18**	**%**

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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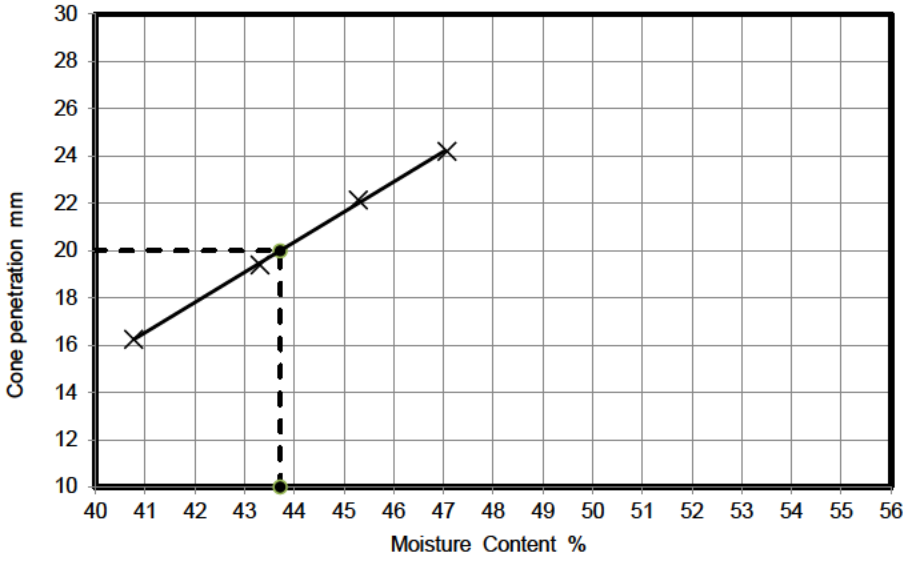
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UKAS TESTING 2519

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LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
Project No.	3750859	Client	Leap Environmental	Borehole/Pit No.	WS1
Soil Description	Light brown slightly mottled light bluish grey slightly sandy silty CLAY			Sample No.	-
				Depth Top	3.40 m
				Depth Base	- m
				Sample Type	D
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

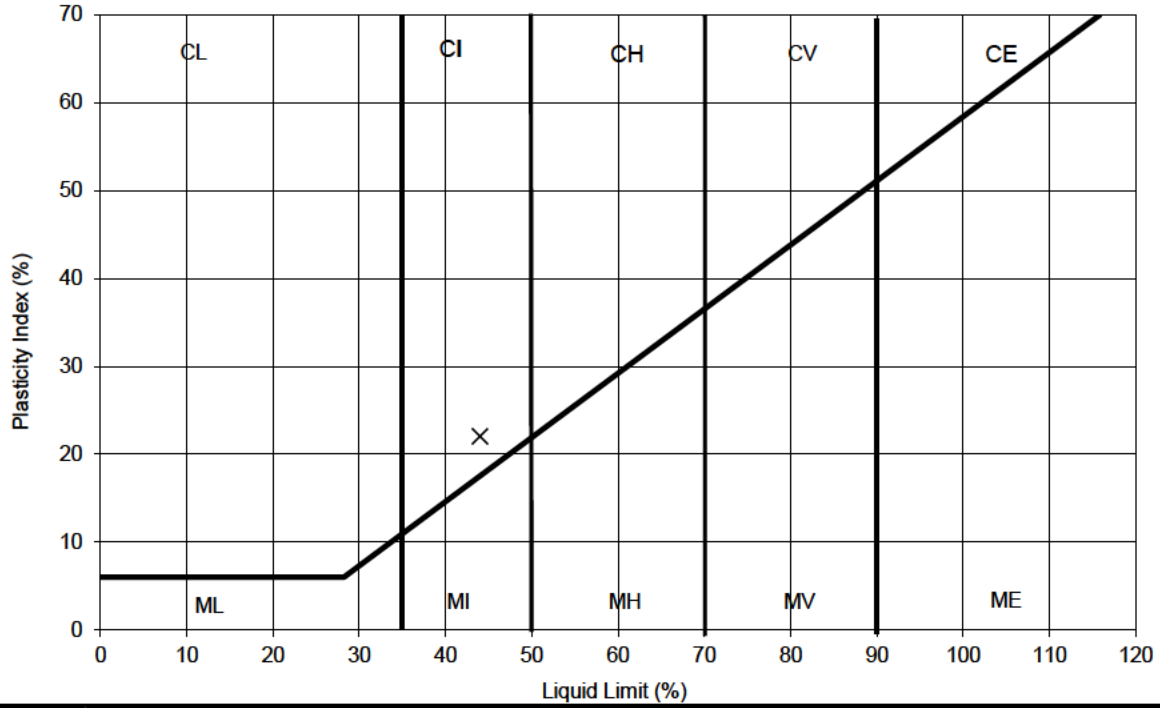


WATER CONTENT	17.8	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	44	%
PLASTIC LIMIT	22	%
PLASTICITY INDEX	22	%

Preparation Method	Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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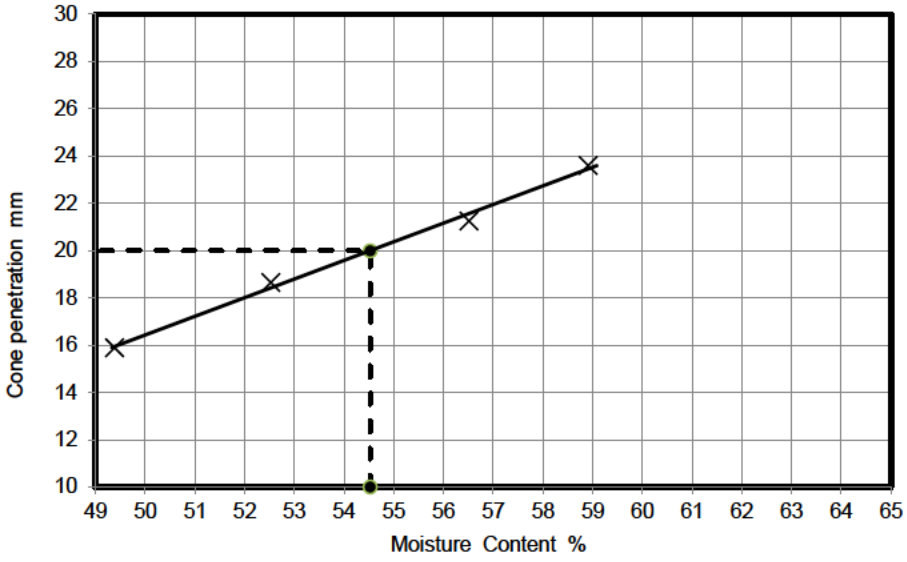
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UKAS TESTING 2519

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LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	WS4
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	0.80 m
Soil Description	Light reddish brown slightly mottled grey slightly gravelly silty CLAY (gravel is fm and sub-angular to rounded)			Depth Base	- m
				Sample Type	D
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

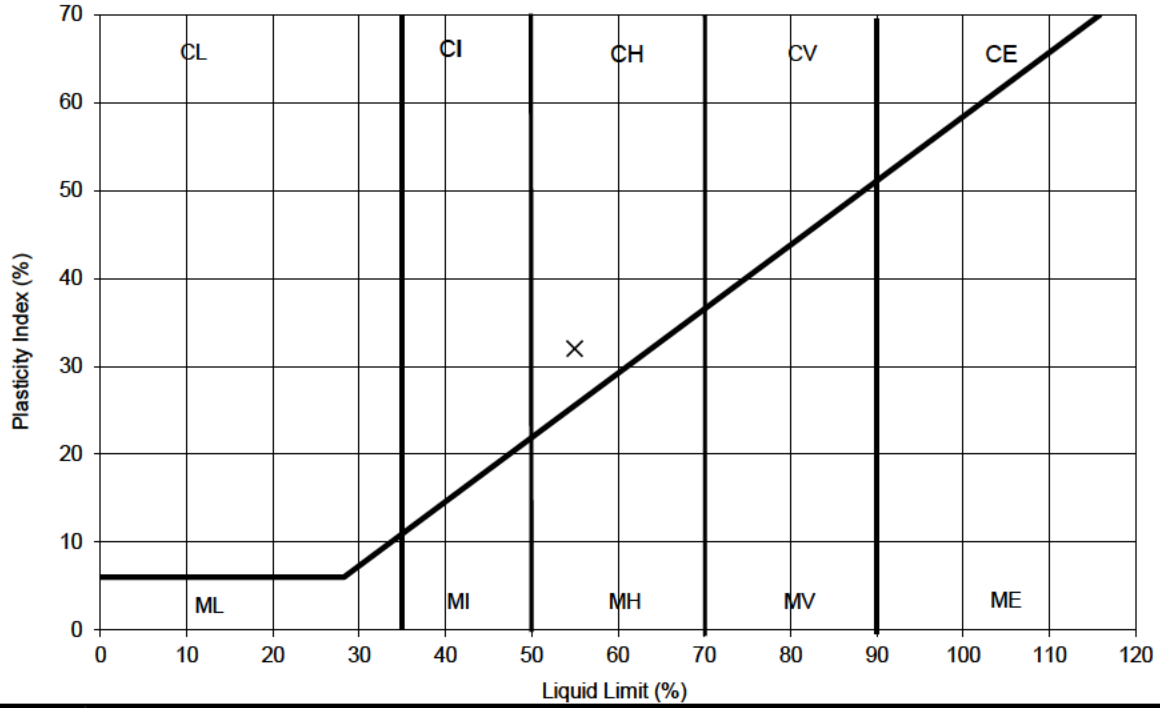


WATER CONTENT	**25.0**	**%**
% PASSING 425µm SIEVE	**96**	**%**
LIQUID LIMIT	**55**	**%**
PLASTIC LIMIT	**23**	**%**
PLASTICITY INDEX	**32**	**%**

Preparation Method	Tested after >425um removed by hand

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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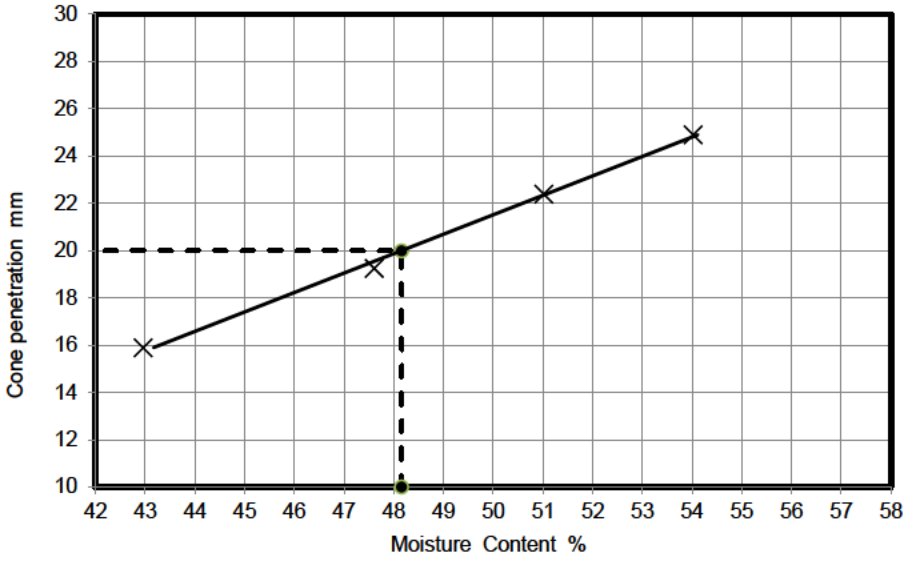
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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Site Name	Duckmoor, Billingshurst			Job No.	36803
				Borehole/Pit No.	WS5
Project No.	3750859	Client	Leap Environmental	Sample No.	-
				Depth Top	0.90 m
Soil Description	Reddish brown slightly mottled light brown slightly gravelly silty CLAY (gravel is fm and sub-angular to rounded)			Depth Base	- m
				Sample Type	D
				Samples received	14/02/2025
				Schedules received	18/02/2025
				Project Started	19/02/2025
				Date Tested	07/03/2025

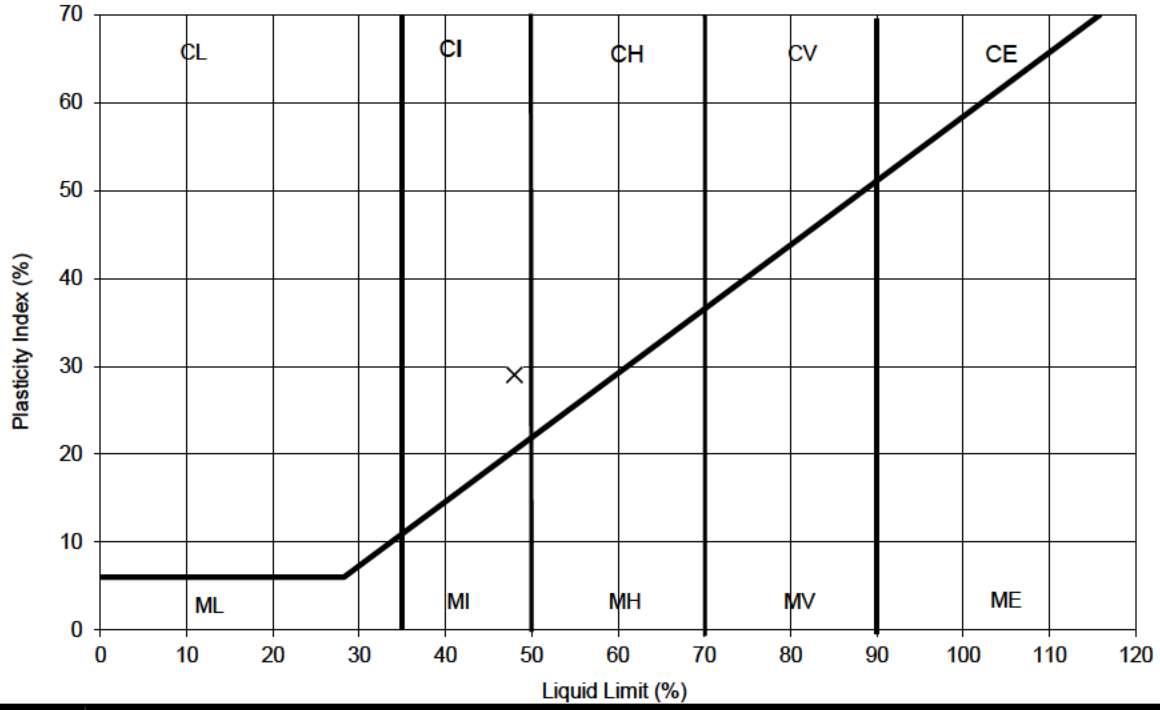


WATER CONTENT	22.9	%
% PASSING 425µm SIEVE	96	%
LIQUID LIMIT	48	%
PLASTIC LIMIT	19	%
PLASTICITY INDEX	29	%

Preparation Method	Tested after >425um removed by hand

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Summary of Water Content, Liquid Limit (4 point) and Plastic Limit Results

Job No.	Project Name	Programme	
36803	Duckmoor, Billingshurst	Samples received	14/02/2025
		Schedule received	18/02/2025
Project No.	Client	Project started	19/02/2025
3750859	Leap Environmental	Testing Started	07/03/2025

Hole No.	Sample				Soil Description	Water Content	Passing 425µm	Preparation	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%		%	%	%	
TP2	-	1.00	-	B	Brown mottled grey silty CLAY with traces of fine rootlets	25.7	100	Tested in natural condition	58	24	34	
TP6	-	0.80	-	B	Brown mottled bluish grey slightly sandy silty CLAY	15.4	100	Tested in natural condition	33	15	18	
TP7	-	1.80	-	B	Brown mottled light bluish grey silty CLAY with orange brown sandy patches and traces of fine rootlets	20.1	100	Tested in natural condition	44	22	22	
TP11	-	0.80	-	B	Reddish brown slightly mottled grey silty CLAY	19.4	100	Tested in natural condition	49	21	28	
TP18	-	0.80	-	B	Light bluish grey mottled brown silty CLAY	21.2	100	Tested in natural condition	43	19	24	
TP19	-	1.50	-	B	Dark reddish brown slightly mottled grey slightly fine sandy silty CLAY	19.1	100	Tested in natural condition	47	22	25	
TP20	-	2.50	-	B	Dark reddish brown slightly mottled brown and light grey slightly fine sandy very silty CLAY	20.3	100	Tested in natural condition	40	22	18	
WS1	-	3.40	-	D	Light brown slightly mottled light bluish grey slightly sandy silty CLAY	17.8	100	Tested in natural condition	44	22	22	
WS4	-	0.80	-	D	Light reddish brown slightly mottled grey slightly gravelly silty CLAY (gravel is fm and sub-angular to rounded)	25.0	96	Tested after >425um removed by hand	55	23	32	
WS5	-	0.90	-	D	Reddish brown slightly mottled light brown slightly gravelly silty CLAY (gravel is fm and sub-angular to rounded)	22.9	96	Tested after >425um removed by hand	48	19	29	

80g/300 cone used unless otherwise stated.

UKAS TESTING
2519

Test Methods: BS EN ISO 17892
Part 1: 2014+A1:2022 Water content
Part 12: 2018+A2:2022 Liquid & plastic limit

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Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials J.P
Date: 11/03/2025

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12

Job No.	Project Name	Programme	
36803	Duckmoor, Billingshurst	Samples received	14/02/2025
		Schedule received	18/02/2025
Project No.	Client	Project started	19/02/2025
3750859	Leap Environmental	Testing Started	28/02/2025

Hole No.	Sample Ref	Sample Top m	Sample Base m	Sample Type	Soil description	Dry Mass passing 2mm %	SO4 Content mg/l	pH	Remarks
TP2	-	1.00	-	B	Brown mottled grey silty CLAY with traces of fine rootlets	100	300	7.8	
TP19	-	1.50	-	B	Dark reddish brown slightly mottled grey slightly fine sandy silty CLAY	100	160	7.9	
WS4	-	0.80	-	D	Light reddish brown slightly mottled grey slightly gravelly silty CLAY (gravel is fm and sub-angular to rounded)	98	110	8.0	

Test Report by K4 SOILS LABORATORY
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Watford Herts WD18 9RU
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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

APPENDIX G – ANALYTICAL SUMMARY AND QUANTITATIVE RISK ASSESSMENT TABLES

3750859: Duckmoor

Table G1: Soil Analytical Results and Human Health QRA

Determinand	Units	LOD	Assessment Criteria Value*	No. of tests	Maximum Detected	Sample Location:	TP2	TP7	TP8	TP11	TP14	TP16	TP17	TP18	TP20	WS1	WS2	WS4
						Depth (m):	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.50	0.20	0.20
						Matrix:	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Clay	Topsoil	Topsoil
						Date Sampled:	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Miscellaneous																		
Moisture content	%	-	n.v.	12	32.9	25.9	8.8	28.5	32.9	21.8	20.8	19.7	9.7	13.7	15.2	24.3	30.8
pH	pH units	0.1	n.v.	8	7.3	6.2			6	5.2	6.2	6		6.4	7.3	6.4	
Total Organic Carbon	%	0.1	n.v.	8	4.18	2.51			4.18	1.95	1.66	1.77		0.61	0.28	2.65	
Soil Organic Matter (calculated)**	%	-	n.v.	8	7.1896	4.32			7.19	3.35	2.86	3.04		1.05	0.48	4.56	
Total Cyanide	mg/kg	1	20	8	0	<1			<1	<1	<1	<1		<1	<1	<1	
Metals																		
Antimony	mg/kg	5	n.v.	2	22.5					7.3					22.5		
Arsenic	mg/kg	1.8	37	8	20.5	15.6			6.6	15.7	10.3	18.5		20.5	6.7	11.3	
Barium	mg/kg	1.9	n.v.	2	235					70.2					235		
Cadmium	mg/kg	1.6	22	8	0	< 1.6			< 1.6	< 1.6	< 1.6	< 1.6		< 1.6	< 1.6	< 1.6	
Chromium	mg/kg	2	910	8	42	25.9			20.2	27.3	24.9	26.3		26.4	42.0	26.5	
Chromium VI	mg/kg	0.04	21	8	0	< 0.040			< 0.040	< 0.040	< 0.040	< 0.040		< 0.040	< 0.040	< 0.040	
Copper	mg/kg	1.6	2,400	8	27.7	10.5			7.9	12.9	10.9	10.3		10	27.7	11.6	
Lead	mg/kg	2.3	200	8	36.6	35.7			26.1	36.4	29.4	36.6		24.2	16.8	28.6	
Mercury	mg/kg	0.7	40	8	0	< 0.7			< 0.7	< 0.7	< 0.7	< 0.7		< 0.7	< 0.7	< 0.7	
Molybdenum	mg/kg	1.6	n.v.	2	0					< 1.6					< 1.6		
Nickel	mg/kg	2.1	130	8	32.1	9.9			6.8	15.2	13.3	11.2		10.4	32.1	13.7	
Selenium	mg/kg	3	250	8	0	< 3.0			< 3.0	< 3.0	< 3.0	< 3.0		< 3.0	< 3.0	< 3.0	
Zinc	mg/kg	4	3,700	8	67	52			38.5	50.1	45.8	51		42.9	67	47.3	
Asbestos																		
Asbestos Identification	-	-	Presence	8	n.a.	NAD			NAD	NAD	NAD	NAD		NAD	NAD	NAD	
Asbestos Quantification	%	0.001	Presence	0	0												
Polycyclic Aromatic Hydrocarbons (USEPA 16)																		
Benzo(a)pyrene	mg/kg	0.01	5.0	8	0.291	< 0.019			0.291	< 0.019	< 0.019	< 0.019		< 0.019	< 0.019	< 0.019	
Naphthalene	mg/kg	0.01	2.3	8	0	< 0.016			< 0.016	< 0.016	< 0.016	< 0.016		< 0.016	< 0.016	< 0.016	
Acenaphthylene	mg/kg	0.01	n.v.	8	0.022	< 0.015			0.022	< 0.015	< 0.015	< 0.015		< 0.015	< 0.015	< 0.015	
Acenaphthene	mg/kg	0.01	n.v.	8	0.026	< 0.013			0.026	< 0.013	< 0.013	< 0.013		< 0.013	< 0.013	< 0.013	
Fluorene	mg/kg	0.01	n.v.	8	0.04	< 0.013			0.04	< 0.013	< 0.013	< 0.013		< 0.013	< 0.013	< 0.013	
Phenanthrene	mg/kg	0.01	n.v.	8	0.162	< 0.014			0.162	< 0.014	< 0.014	< 0.014		< 0.014	< 0.014	0.014	
Anthracene	mg/kg	0.01	n.v.	8	0.108	< 0.017			0.108	< 0.017	< 0.017	< 0.017		< 0.017	< 0.017	< 0.017	
Fluoranthene	mg/kg	0.01	n.v.	8	0.375	0.024			0.375	0.02	0.03	0.028		< 0.017	< 0.017	0.03	
Pyrene	mg/kg	0.01	n.v.	8	0.347	0.022			0.347	0.018	0.027	0.023		< 0.016	< 0.016	0.026	
Benzo(a)anthracene	mg/kg	0.01	n.v.	8	0.313	0.02			0.313	0.024	0.022	0.027		< 0.012	< 0.012	0.026	
Chrysene	mg/kg	0.02	n.v.	8	0.381	< 0.028			0.381	< 0.028	< 0.028	< 0.028		< 0.028	< 0.028	< 0.028	
Benzo(b)fluoranthene	mg/kg	0.02	n.v.	8	0.35	< 0.020			0.35	< 0.020	< 0.020	< 0.020		< 0.020	< 0.020	< 0.020	
Benzo(k)fluoranthene	mg/kg	0.02	n.v.	8	0.293	< 0.025			0.293	< 0.025	< 0.025	< 0.025		< 0.025	< 0.025	< 0.025	
Indeno(1,2,3-cd)pyrene	mg/kg	0.01	n.v.	8	0.27	< 0.019			0.27	< 0.019	< 0.019	< 0.019		< 0.019	< 0.019	< 0.019	
D benzo(ah)anthracene	mg/kg	0.01	n.v.	8	0.225	< 0.017			0.225	< 0.017	< 0.017	< 0.017		< 0.017	< 0.017	< 0.017	
Benzo(ghi)perylene	mg/kg	0.01	n.v.	8	0.276	< 0.019			0.276	< 0.019	< 0.019	< 0.019		< 0.019	< 0.019	< 0.019	
Coroene	mg/kg	0.02	n.v.	2	0					< 0.020					< 0.020		
Total PAH (16)	mg/kg	0.02	n.v.	8	3.48	< 0.280			3.48	< 0.280	< 0.280	< 0.280		< 0.280	< 0.280	< 0.280	
Total PAH (17)	mg/kg	0.03	n.v.	2	0					< 0.300					< 0.300		
Petroleum Hydrocarbons																		
Benzene	mg/kg	0.001	0.26	4	0	< 0.0005				< 0.0005					< 0.0005	< 0.0005	
Toluene	mg/kg	0.001	130	4	0	< 0.001				< 0.001					< 0.001	< 0.001	
Ethylbenzene	mg/kg	0.001	47	4	0	< 0.001				< 0.001					< 0.001	< 0.001	
Xylenes	mg/kg	0.003	56	2	0					< 0.003					< 0.003		
Methyl tert-Butyl Ether	mg/kg	0.002	62	4	0	< 0.002				< 0.002					< 0.002	< 0.002	
>C5-C6 Aliphatic	mg/kg	0.1	42	2	0	< 0.10										< 0.10	
>C6-C8 Aliphatic	mg/kg	0.1	100	2	0	< 0.10										< 0.10	
>C8-C10 Aliphatic	mg/kg	0.1	27	2	0	< 0.10										< 0.10	
>C10-C12 Aliphatic	mg/kg	1	130	2	0	< 1.0										< 1.0	
>C12-C16 Aliphatic	mg/kg	0.5	1,100	2	0	< 0.5										< 0.5	
>C16-C21 Aliphatic	mg/kg	0.7	65,000	2	0	< 0.7										< 0.7	
>C21-C35 Aliphatic	mg/kg	4		2	0	< 4.0										< 4.0	
>C35-C40 Aliphatic	mg/kg	0.5	65,000	2	0	< 0.5										< 0.5	
>C5-C7 Aromatic	mg/kg	0.01	70	2	0	< 0.010										< 0.010	
>C7-C8 Aromatic	mg/kg	0.01	130	2	0	< 0.010										< 0.010	
>C8-C10 Aromatic	mg/kg	0.01	34	2	0	< 0.010										< 0.010	
>C10-C12 Aromatic	mg/kg	0.6	74	2	0.7	0.7										< 0.6	
>C12-C16 Aromatic	mg/kg	1	140	2	1	1										< 1.0	
>C16-C21 Aromatic	mg/kg	2	260	2	0	< 2.0										< 2.0	
>C21-C35 Aromatic	mg/kg	4.5	1,100	2	0	< 4.5										< 4.5	
>C35-C40 Aromatic	mg/kg	1.5	1,600	2	1.9	1.9										< 1.5	
Total (>C5-C40) Ali/Aro	mg/kg	11.5	n.v.	2	0	< 11.5										< 11.5	
PCBs																		
Total PCBs (7 congeners)	mg/kg	0.035	n.v.	2	0					< 0.035					< 0.035		
PCB 101	mg/kg	0.015	n.v.	2	0					< 0.015					< 0.015		
PCB 118	mg/kg	0.015	n.v.	2	0					< 0.015					< 0.015		
PCB 138	mg/kg	0.015	n.v.	2	0					< 0.015					< 0.015		
PCB 153	mg/kg	0.01	n.v.	2	0					< 0.010					< 0.010		
PCB 180	mg/kg	0.01	n.v.	2	0					< 0.010					< 0.010		
PCB 28	mg/kg	0.015	n.v.	2	0					< 0.015					< 0.015		
PCB 52	mg/kg	0.01	n.v.	2	0					< 0.010					< 0.010		
Organochlorine Pesticides																		
alpha-HCH	ug/kg	10	230	2	0	< 10.0						< 10.0						
beta_HCH	ug/kg	10	85	2	0	< 10.0						< 10.0						
gamma-HCH	ug/kg	10	60	2	0	< 10.0						< 10.0						
delta-HCH	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
Heptachlor	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
Aldrin	ug/kg	10	5,700	2	0	< 10.0						< 10.0						
Heptachlor expoxide	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
trans-Chlordane	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
alpha cis-Chlordane	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
p,p-DDE	ug/kg	10	n.v.	1	0	< 10.0						< 10.0						
Dieldrin	ug/kg	10	970	2	0	< 10.0						< 10.0						
Endrin	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
p,p-DDD	ug/kg	10	n.v.	0	0	< 10.0						< 10.0						
Chlorfenvinphos	ug/kg	10	970	2	0	< 10.0						< 10.0						
Endosulfan II	ug/kg	10	7,000	2	0	< 10.0						< 10.0						
Endrin aldehyde	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
p,p-DDT	ug/kg	10	n.v.	0	0	< 10.0						< 10.0						
Endosulphan sulphate	ug/kg	10	7400	2	0	< 10.0						< 10.0						
Methoxychlor	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
Endrin ketone	ug/kg	10	n.v.	2	0	< 10.0						< 10.0						
Organophosphorus Pesticides																		
Aziniphos-ethyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Aziniphos-methyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Bromophos-Methyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Carbophenothion	ug/kg	100	n.v.	2	0	< 100						< 100						
Chlorpyrifos	ug/kg	100	n.v.	2	0	< 100						< 100						
Chlorpyriphos Methyl	ug/kg	100	n.v.	2	0	< 100						< 100						
cis-Chlorfenvinphos	ug/kg	100	n.v.	2	0	< 100						< 100						
Diazanon	ug/kg	100	n.v.	2	0	< 100						< 100						
Dichlorvos	ug/kg	100	32	2	0	< 100						< 100						
Dimethoate	ug/kg	100	n.v.	2	0	< 100						< 100						
Ethion	ug/kg	100	n.v.	2	0	< 100						< 100						
Fenitrothion	ug/kg	100	n.v.	2	0	< 100						< 100						
Fenthion	ug/kg	100	n.v.	2	0	< 100						< 100						
Malathion	ug/kg	100	n.v.	2	0	< 100						< 100						
Mevinphos E	ug/kg	100	n.v.	2	0	< 100						< 100						
Parathion-Ethyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Parathion-Methyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Perimiphos-Methyl	ug/kg	100	n.v.	2	0	< 100						< 100						
Phorate	ug/kg	100	n.v.	2	0	< 100						< 100						
Phosalone	ug/kg	100	n.v.	2	0	< 100						< 100						
Propetamphos	ug/kg	100	n.v.	2	0	< 100						< 100						
trans-Chlorfenvinphos	ug/kg	100	n.v.	2	0	< 100						< 100						
Triadimefom	ug/kg	100	n.v.	2	0	< 100						< 100						
Triazafos	ug/kg	100	n.v.	2	0	< 100						< 100						
Triazines																		
Ametryn	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Atrazine	ug/kg	100	3300	2	0	< 10.0						< 10.0						
Atraton	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Prometon	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Prometryn	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Propazine	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Trietazine	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Simazine	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Simetryn	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Terbuthylazine	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						
Terbutryn	ug/kg	100	n.v.	2	0	< 10.0						< 10.0						

* Assuming 1% SOM for organic compounds

** - Soil Organic Matter = Total Organic Carbon x 1.72

NAD = No asbestos detected

MG = Made Ground

BLANK = not tested

n.a = not applicable

n.v = no published value available

- Exceedances of Residential with Homegrown Produce GAC

APPENDIX H – GEOENVIRONMENTAL ANALYTICAL LABORATORY CERTIFICATES

ANALYTICAL TEST REPORT

Report Number	25-01431, issue number 1
Contract name:	LEAP
Client reference:	3750859
Clients name:	RSK Environment Ltd (Leap Environmental)
Clients address:	RSK Environment Ltd (Leap Environmental) 1 Forest Park Way Pease Pottage West Sussex RH11 9ZG
Samples received:	14/02/2025
Analysis started:	17/02/2025
Analysis completed:	25/02/2025
Report issued:	25/02/2025

Key	U UKAS accredited test M MCERTS & UKAS accredited test $ Test carried out by an approved subcontractor I/S Insufficient sample to carry out test U/S Sample not suitable for testing NAD No Asbestos Detected
Approved by:	Abbie Neasham-Bourn Senior Reporting Administrator

Unit 6 Parkhead, Greencroft Industrial Park, Stanley, County Durham, DH9 7YB

Telephone: (01207) 528578, Email supportsquad@chemtech-env.co.uk

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
35756	WS2	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	24.3
35757	TP16	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	20.8
35758	TP2	0.00 - 0.30	Brown Clayey Loam and Vegetation.	-	-	25.9
35759	TP11	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	32.9
35760	TP14	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	21.8
35761	TP17	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	19.7
35762	TP20	0.00 - 0.20	Brown Clayey Loam and Vegetation.	-	-	13.7
35763	WS1	0.00 - 0.50	Brown Clay and Vegetation.	-	-	15.2
35764	TP8	0.00 - 0.20	Brown Loamy Clay with Gravel and Vegetation.	-	-	28.5
35765	WS4	0.00 - 0.20	Brown Loamy Clay with Gravel and Vegetation.	-	-	30.8
35766	TP18	0.00 - 0.20	Brown Sandy Loamy Clay with Vegetation.	-	-	9.7
35767	TP7	0.00 - 0.20	Brown Sandy Loamy Clay with Vegetation.	-	-	8.8

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

a	Sampling date not provided
b	Sampling time not provided (waters only)
c	Sample not received in appropriate containers
d	Storage Temperature
e	Headspace present in sample container
f	Sample exceeded sampling to reciept
g	Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
35756	WS2	0.00 - 0.20	N	
35757	TP16	0.00 - 0.20	N	
35758	TP2	0.00 - 0.30	N	
35759	TP11	0.00 - 0.20	N	
35760	TP14	0.00 - 0.20	N	
35761	TP17	0.00 - 0.20	N	
35762	TP20	0.00 - 0.20	N	
35763	WS1	0.00 - 0.50	N	
35764	TP8	0.00 - 0.20	N	
35765	WS4	0.00 - 0.20	N	

SOILS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	NAD	NAD	NAD	NAD
Metals									
Water Soluble Sulphate	CE061	M	0.01	g/l	0.098	0.019	0.025	0.031	0.017
Antimony	CE264	N	5	mg/kg	n/t	n/t	n/t	n/t	7.3
Arsenic	CE264	U	1.8	mg/kg	11.3	10.3	15.6	6.6	15.7
Barium	CE264	U	1.9	mg/kg	n/t	n/t	n/t	n/t	70.2
Cadmium	CE264	M	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Chromium	CE264	U	2	mg/kg	26.5	24.9	25.9	20.2	27.3
Copper	CE264	M	1.6	mg/kg	11.6	10.9	10.5	7.9	12.9
Lead	CE264	U	2.3	mg/kg	28.6	29.4	35.7	26.1	36.4
Mercury	CE264	U	0.7	mg/kg	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Molybdenum	CE264	U	1.6	mg/kg	n/t	n/t	n/t	n/t	< 1.6
Nickel	CE264	M	2.1	mg/kg	13.7	13.3	9.9	6.8	15.2
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	47.3	45.8	52.0	38.5	50.1
PCB (ICES 7 congeners)									
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	n/t	n/t	n/t	n/t	< 0.035
PCB 101	CE137	M	0.015	mg/kg	n/t	n/t	n/t	n/t	< 0.015
PCB 118	CE137	M	0.015	mg/kg	n/t	n/t	n/t	n/t	< 0.015
PCB 138	CE137	M	0.015	mg/kg	n/t	n/t	n/t	n/t	< 0.015
PCB 153	CE137	M	0.01	mg/kg	n/t	n/t	n/t	n/t	< 0.010
PCB 180	CE137	M	0.01	mg/kg	n/t	n/t	n/t	n/t	< 0.010
PCB 28	CE137	M	0.015	mg/kg	n/t	n/t	n/t	n/t	< 0.015
PCB 52	CE137	M	0.01	mg/kg	n/t	n/t	n/t	n/t	< 0.010
Colourimetric									
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Total Monohydric Phenols	CE078	N	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Cyanide	CE077	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphide	CE167	N	10	mg/kg	17	25	< 10	< 10	< 10
Combustion									

SOILS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Moisture Content	CE001	N	0.1	%	24.3	20.8	25.9	32.9	21.8
Total Organic Carbon	CE197	N	0.1	%	2.65	1.66	2.51	4.18	1.95
Loss on Ignition	CE006	U	0.1	%	n/t	n/t	n/t	n/t	7.20
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	< 0.015	< 0.015	0.022	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	< 0.013	0.026	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	< 0.013	0.040	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	0.014	< 0.014	< 0.014	0.162	< 0.014
Anthracene	CE087	U	0.017	mg/kg	< 0.017	< 0.017	< 0.017	0.108	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	0.030	0.030	0.024	0.375	0.020
Pyrene	CE087	M	0.016	mg/kg	0.026	0.027	0.022	0.347	0.018
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.026	0.022	0.020	0.313	0.024
Chrysene	CE087	M	0.028	mg/kg	< 0.028	< 0.028	< 0.028	0.381	< 0.028
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	< 0.020	< 0.020	0.350	< 0.020
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	< 0.025	< 0.025	0.293	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	< 0.019	< 0.019	0.291	< 0.019
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	0.270	< 0.019
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	0.225	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	0.276	< 0.019
Coronene	CE087	N	0.02	mg/kg	n/t	n/t	n/t	n/t	< 0.020
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	< 0.280	< 0.280	3.48	< 0.280
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	n/t	n/t	n/t	< 0.300
BTEX									
Benzene	CE267	U	0.0005	mg/kg	n/t	n/t	n/t	n/t	< 0.0005
Toluene	CE267	U	0.001	mg/kg	n/t	n/t	n/t	n/t	< 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	n/t	n/t	n/t	< 0.001
Xylenes	CE267	N	0.003	mg/kg	n/t	n/t	n/t	n/t	< 0.003
MTBE	CE267	N	0.002	mg/kg	n/t	n/t	n/t	n/t	< 0.002
Total BTEX	CE267	N	0.006	mg/kg	n/t	n/t	n/t	n/t	< 0.006
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	n/t	n/t	n/t	< 0.002
oXylenes	CE267	U	0.002	mg/kg	n/t	n/t	n/t	n/t	< 0.002
Total Petroleum Hydrocarbons									

SOILS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t	n/t	n/t
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	n/t	n/t	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t	n/t	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	n/t	n/t	n/t	n/t
>C35-C40 Aromatic (EH_2D_AR)	CE250	N	1.5	mg/kg	n/t	n/t	n/t	n/t	n/t
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	n/t	n/t
>C10-C40 Total (EH_2D_Total)	CE250	N	11.5	mg/kg	n/t	n/t	n/t	n/t	n/t
Total Hydrocabons C5-C40 (HS_1D+EH_2D_	CE250	N	11.5	mg/kg	n/t	n/t	n/t	n/t	n/t
Mineral Oil (>C10-C40 Total) (EH_CU_1D_T	CE162	N	19	mg/kg	n/t	n/t	n/t	n/t	< 19
Wet Chem									
pH	CE004	M	0.1	pH units	6.4	6.2	6.2	6.0	5.2
Acid Neutralisation Capacity pH4	CE083	N	0.02	mol/kg	n/t	n/t	n/t	n/t	< 0.020
Acid Neutralisation Capacity pH7	CE083	N	0.02	mol/kg	n/t	n/t	n/t	n/t	< 0.020
OCP									
alpha-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
beta_HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
gamma-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
delta-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Heptachlor	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Aldrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
alpha cis-Chlordane	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDE	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Dieldrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDD	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulfan II	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulfan II	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDT	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Methoxychlor	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin ketone	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
OPP									
Aziniphos-ethyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Bromophos-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Carbophenothion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Chlorpyriphos Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
cis-Chlorfenvinphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Diazanon	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Dichlorvos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Dimethoate	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Ethion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Fenitrothion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Fenthion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Malathion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Mevinphos E	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Parathion-Ethyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Parathion-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Perimiphos-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Phorate	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Phosalone	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Propetamphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
trans-Chlorfenvinphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Triadimefom	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Triazafos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
TRIAZINES									
Ametryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Atrazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Atraton	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Prometon	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Prometryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Propazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Trietazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Simazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Simetryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Terbuthylazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Terbutryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35761	35762	35763	35764	35765
Sample ID					TP17	TP20	WS1	TP8	WS4
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	NAD	NAD	n/t	n/t
Metals									
Water Soluble Sulphate	CE061	M	0.01	g/l	0.018	0.013	0.238	n/t	n/t
Antimony	CE264	N	5	mg/kg	n/t	n/t	22.5	n/t	n/t
Arsenic	CE264	U	1.8	mg/kg	18.5	20.5	6.7	n/t	n/t
Barium	CE264	U	1.9	mg/kg	n/t	n/t	235	n/t	n/t
Cadmium	CE264	M	1.6	mg/kg	< 1.6	< 1.6	< 1.6	n/t	n/t
Chromium	CE264	U	2	mg/kg	26.3	26.4	42.0	n/t	n/t
Copper	CE264	M	1.6	mg/kg	10.3	10.0	27.7	n/t	n/t
Lead	CE264	U	2.3	mg/kg	36.6	24.2	16.8	n/t	n/t
Mercury	CE264	U	0.7	mg/kg	< 0.7	< 0.7	< 0.7	n/t	n/t
Molybdenum	CE264	U	1.6	mg/kg	n/t	n/t	< 1.6	n/t	n/t
Nickel	CE264	M	2.1	mg/kg	11.2	10.4	32.1	n/t	n/t
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	n/t	n/t
Zinc	CE264	M	4	mg/kg	51.0	42.9	67.0	n/t	n/t
PCB (ICES 7 congeners)									
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	n/t	n/t	< 0.035	n/t	n/t
PCB 101	CE137	M	0.015	mg/kg	n/t	n/t	< 0.015	n/t	n/t
PCB 118	CE137	M	0.015	mg/kg	n/t	n/t	< 0.015	n/t	n/t
PCB 138	CE137	M	0.015	mg/kg	n/t	n/t	< 0.015	n/t	n/t
PCB 153	CE137	M	0.01	mg/kg	n/t	n/t	< 0.010	n/t	n/t
PCB 180	CE137	M	0.01	mg/kg	n/t	n/t	< 0.010	n/t	n/t
PCB 28	CE137	M	0.015	mg/kg	n/t	n/t	< 0.015	n/t	n/t
PCB 52	CE137	M	0.01	mg/kg	n/t	n/t	< 0.010	n/t	n/t
Colourimetric									
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	n/t	n/t
Total Monohydric Phenols	CE078	N	0.5	mg/kg	< 0.50	< 0.50	< 0.50	n/t	n/t
Total Cyanide	CE077	N	1	mg/kg	< 1.0	< 1.0	< 1.0	n/t	n/t
Total Sulphide	CE167	N	10	mg/kg	18	< 10	22	n/t	n/t
Combustion									

SOILS

Lab Number					35761	35762	35763	35764	35765
Sample ID					TP17	TP20	WS1	TP8	WS4
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Moisture Content	CE001	N	0.1	%	19.7	13.7	15.2	28.5	30.8
Total Organic Carbon	CE197	N	0.1	%	1.77	0.61	0.28	n/t	n/t
Loss on Ignition	CE006	U	0.1	%	n/t	n/t	7.21	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	n/t	n/t
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	< 0.015	< 0.015	n/t	n/t
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	< 0.013	n/t	n/t
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	< 0.013	n/t	n/t
Phenanthrene	CE087	M	0.014	mg/kg	< 0.014	< 0.014	< 0.014	n/t	n/t
Anthracene	CE087	U	0.017	mg/kg	< 0.017	< 0.017	< 0.017	n/t	n/t
Fluoranthene	CE087	M	0.017	mg/kg	0.028	< 0.017	< 0.017	n/t	n/t
Pyrene	CE087	M	0.016	mg/kg	0.023	< 0.016	< 0.016	n/t	n/t
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.027	< 0.012	< 0.012	n/t	n/t
Chrysene	CE087	M	0.028	mg/kg	< 0.028	< 0.028	< 0.028	n/t	n/t
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	< 0.020	< 0.020	n/t	n/t
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	< 0.025	< 0.025	n/t	n/t
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	n/t	n/t
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Coronene	CE087	N	0.02	mg/kg	n/t	n/t	< 0.020	n/t	n/t
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	< 0.280	< 0.280	n/t	n/t
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	n/t	< 0.300	n/t	n/t
BTEX									
Benzene	CE267	U	0.0005	mg/kg	n/t	n/t	< 0.0005	< 0.0005	< 0.0005
Toluene	CE267	U	0.001	mg/kg	n/t	n/t	< 0.001	< 0.001	< 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	n/t	< 0.001	< 0.001	< 0.001
Xylenes	CE267	N	0.003	mg/kg	n/t	n/t	< 0.003	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	n/t	n/t	< 0.002	< 0.002	< 0.002
Total BTEX	CE267	N	0.006	mg/kg	n/t	n/t	< 0.006	n/t	n/t
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	n/t	< 0.002	< 0.002	< 0.002
oXylenes	CE267	U	0.002	mg/kg	n/t	n/t	< 0.002	< 0.002	< 0.002
Total Petroleum Hydrocarbons									

SOILS

Lab Number					35761	35762	35763	35764	35765
Sample ID					TP17	TP20	WS1	TP8	WS4
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	< 0.10	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	< 0.10	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	< 0.10	< 0.10
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	n/t	n/t	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t	< 0.5	< 0.5
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	n/t	n/t	< 0.7	< 0.7
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	n/t	n/t	< 4.0	< 4.0
>C35-C40 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t	< 0.5	< 0.5
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	< 0.010	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	< 0.010	< 0.010
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t	< 0.010	< 0.010
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	n/t	n/t	0.7	< 0.6
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	n/t	n/t	1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t	< 2.0	< 2.0
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	n/t	n/t	< 4.5	< 4.5
>C35-C40 Aromatic (EH_2D_AR)	CE250	N	1.5	mg/kg	n/t	n/t	n/t	1.9	< 1.5
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	n/t	n/t	n/t	< 0.10	< 0.10
>C10-C40 Total (EH_2D_Total)	CE250	N	11.5	mg/kg	n/t	n/t	n/t	< 11.5	< 11.5
Total Hydrocabons C5-C40 (HS_1D+EH_2D_	CE250	N	11.5	mg/kg	n/t	n/t	n/t	< 11.5	< 11.5
Mineral Oil (>C10-C40 Total) (EH_CU_1D_T	CE162	N	19	mg/kg	n/t	n/t	< 19	n/t	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	6.0	6.4	7.3	n/t	n/t
Acid Neutralisation Capacity pH4	CE083	N	0.02	mol/kg	n/t	n/t	0.090	n/t	n/t
Acid Neutralisation Capacity pH7	CE083	N	0.02	mol/kg	n/t	n/t	< 0.020	n/t	n/t
OCP									
alpha-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
beta_HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
gamma-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
delta-HCH	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Heptachlor	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Aldrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35761	35762	35763	35764	35765
Sample ID					TP17	TP20	WS1	TP8	WS4
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
alpha cis-Chlordane	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDE	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Dieldrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDD	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulfan II	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulfan II	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
p,p-DDT	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Methoxychlor	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Endrin ketone	CE271	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
OPP									
Aziniphos-ethyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Bromophos-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Carbophenothion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Chlorpyriphos Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
cis-Chlorfenvinphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Diazanon	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Dichlorvos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Dimethoate	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Ethion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Fenitrothion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Fenthion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Malathion	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Mevinphos E	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Parathion-Ethyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Parathion-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Perimiphos-Methyl	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Phorate	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Phosalone	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35761	35762	35763	35764	35765
Sample ID					TP17	TP20	WS1	TP8	WS4
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Propetamphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
trans-Chlorfenvinphos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Triadimefom	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
Triazafos	CE273	N	100	µg/kg	n/t	n/t	n/t	n/t	n/t
TRIAZINES									
Ametryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Atrazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Atraton	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Prometon	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Prometryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Propazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Trietazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Simazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Simetryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Terbuthylazine	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t
Terbutryn	CE275	N	10	µg/kg	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					35766	35767
Sample ID					TP18	TP7
Depth (m)					0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**		
Asbestos						
Asbestos Identification	SUBCON	SU	0	-	n/t	n/t
Metals						
Water Soluble Sulphate	CE061	M	0.01	g/l	n/t	n/t
Antimony	CE264	N	5	mg/kg	n/t	n/t
Arsenic	CE264	U	1.8	mg/kg	n/t	n/t
Barium	CE264	U	1.9	mg/kg	n/t	n/t
Cadmium	CE264	M	1.6	mg/kg	n/t	n/t
Chromium	CE264	U	2	mg/kg	n/t	n/t
Copper	CE264	M	1.6	mg/kg	n/t	n/t
Lead	CE264	U	2.3	mg/kg	n/t	n/t
Mercury	CE264	U	0.7	mg/kg	n/t	n/t
Molybdenum	CE264	U	1.6	mg/kg	n/t	n/t
Nickel	CE264	M	2.1	mg/kg	n/t	n/t
Selenium	CE264	U	3	mg/kg	n/t	n/t
Zinc	CE264	M	4	mg/kg	n/t	n/t
PCB (ICES 7 congeners)						
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	n/t	n/t
PCB 101	CE137	M	0.015	mg/kg	n/t	n/t
PCB 118	CE137	M	0.015	mg/kg	n/t	n/t
PCB 138	CE137	M	0.015	mg/kg	n/t	n/t
PCB 153	CE137	M	0.01	mg/kg	n/t	n/t
PCB 180	CE137	M	0.01	mg/kg	n/t	n/t
PCB 28	CE137	M	0.015	mg/kg	n/t	n/t
PCB 52	CE137	M	0.01	mg/kg	n/t	n/t
Colourimetric						
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	n/t	n/t
Total Monohydric Phenols	CE078	N	0.5	mg/kg	n/t	n/t
Total Cyanide	CE077	N	1	mg/kg	n/t	n/t
Total Sulphide	CE167	N	10	mg/kg	n/t	n/t
Combustion						

SOILS

Lab Number					35766	35767
Sample ID					TP18	TP7
Depth (m)					0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025
Moisture Content	CE001	N	0.1	%	9.7	8.8
Total Organic Carbon	CE197	N	0.1	%	n/t	n/t
Loss on Ignition	CE006	U	0.1	%	n/t	n/t
Polyaromatic hydrocarbons						
Naphthalene	CE087	M	0.016	mg/kg	n/t	n/t
Acenaphthylene	CE087	M	0.015	mg/kg	n/t	n/t
Acenaphthene	CE087	M	0.013	mg/kg	n/t	n/t
Fluorene	CE087	U	0.013	mg/kg	n/t	n/t
Phenanthrene	CE087	M	0.014	mg/kg	n/t	n/t
Anthracene	CE087	U	0.017	mg/kg	n/t	n/t
Fluoranthene	CE087	M	0.017	mg/kg	n/t	n/t
Pyrene	CE087	M	0.016	mg/kg	n/t	n/t
Benzo(a)anthracene	CE087	U	0.012	mg/kg	n/t	n/t
Chrysene	CE087	M	0.028	mg/kg	n/t	n/t
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	n/t	n/t
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	n/t	n/t
Benzo(a)pyrene	CE087	U	0.019	mg/kg	n/t	n/t
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	n/t	n/t
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	n/t	n/t
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	n/t	n/t
Coronene	CE087	N	0.02	mg/kg	n/t	n/t
Total PAH(16)	CE087	N	0.28	mg/kg	n/t	n/t
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	n/t
BTEX						
Benzene	CE267	U	0.0005	mg/kg	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	n/t
Xylenes	CE267	N	0.003	mg/kg	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	n/t	n/t
Total BTEX	CE267	N	0.006	mg/kg	n/t	n/t
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	n/t	n/t
Total Petroleum Hydrocarbons						

SOILS

Lab Number					35766	35767
Sample ID					TP18	TP7
Depth (m)					0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	n/t
>C35-C40 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	n/t
>C35-C40 Aromatic (EH_2D_AR)	CE250	N	1.5	mg/kg	n/t	n/t
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	n/t	n/t
>C10-C40 Total (EH_2D_Total)	CE250	N	11.5	mg/kg	n/t	n/t
Total Hydrocabons C5-C40 (HS_1D+EH_2D_	CE250	N	11.5	mg/kg	n/t	n/t
Mineral Oil (>C10-C40 Total) (EH_CU_1D_T	CE162	N	19	mg/kg	n/t	n/t
Wet Chem						
pH	CE004	M	0.1	pH units	n/t	n/t
Acid Neutralisation Capacity pH4	CE083	N	0.02	mol/kg	n/t	n/t
Acid Neutralisation Capacity pH7	CE083	N	0.02	mol/kg	n/t	n/t
OCP						
alpha-HCH	CE271	N	10	µg/kg	< 10.0	< 10.0
beta_HCH	CE271	N	10	µg/kg	< 10.0	< 10.0
gamma-HCH	CE271	N	10	µg/kg	< 10.0	< 10.0
delta-HCH	CE271	N	10	µg/kg	< 10.0	< 10.0
Heptachlor	CE271	N	10	µg/kg	< 10.0	< 10.0
Aldrin	CE271	N	10	µg/kg	< 10.0	< 10.0
Heptachlor expoxide	CE271	N	10	µg/kg	< 10.0	< 10.0
trans-Chlordane	CE271	N	10	µg/kg	< 10.0	< 10.0

SOILS

Lab Number					35766	35767
Sample ID					TP18	TP7
Depth (m)					0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025
alpha cis-Chlordane	CE271	N	10	µg/kg	< 10.0	< 10.0
p,p-DDE	CE271	N	10	µg/kg	< 10.0	< 10.0
Dieldrin	CE271	N	10	µg/kg	< 10.0	< 10.0
Endrin	CE271	N	10	µg/kg	< 10.0	< 10.0
p,p-DDD	CE271	N	10	µg/kg	< 10.0	< 10.0
Endosulfan II	CE271	N	10	µg/kg	< 10.0	< 10.0
Endosulfan II	CE271	N	10	µg/kg	< 10.0	< 10.0
Endrin aldehyde	CE271	N	10	µg/kg	< 10.0	< 10.0
p,p-DDT	CE271	N	10	µg/kg	< 10.0	< 10.0
Endosulphan sulphate	CE271	N	10	µg/kg	< 10.0	< 10.0
Methoxychlor	CE271	N	10	µg/kg	< 10.0	< 10.0
Endrin ketone	CE271	N	10	µg/kg	< 10.0	< 10.0
OPP						
Aziniphos-ethyl	CE273	N	100	µg/kg	< 100	< 100
Aziniphos-methyl	CE273	N	100	µg/kg	< 100	< 100
Bromophos-Methyl	CE273	N	100	µg/kg	< 100	< 100
Carbophenothion	CE273	N	100	µg/kg	< 100	< 100
Chlorpyrifos	CE273	N	100	µg/kg	< 100	< 100
Chlorpyriphos Methyl	CE273	N	100	µg/kg	< 100	< 100
cis-Chlorfenvinphos	CE273	N	100	µg/kg	< 100	< 100
Diazanon	CE273	N	100	µg/kg	< 100	< 100
Dichlorvos	CE273	N	100	µg/kg	< 100	< 100
Dimethoate	CE273	N	100	µg/kg	< 100	< 100
Ethion	CE273	N	100	µg/kg	< 100	< 100
Fenitrothion	CE273	N	100	µg/kg	< 100	< 100
Fenthion	CE273	N	100	µg/kg	< 100	< 100
Malathion	CE273	N	100	µg/kg	< 100	< 100
Mevinphos E	CE273	N	100	µg/kg	< 100	< 100
Parathion-Ethyl	CE273	N	100	µg/kg	< 100	< 100
Parathion-Methyl	CE273	N	100	µg/kg	< 100	< 100
Perimiphos-Methyl	CE273	N	100	µg/kg	< 100	< 100
Phorate	CE273	N	100	µg/kg	< 100	< 100
Phosalone	CE273	N	100	µg/kg	< 100	< 100

SOILS

Lab Number					35766	35767
Sample ID					TP18	TP7
Depth (m)					0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025
Propetamphos	CE273	N	100	µg/kg	< 100	< 100
trans-Chlorfenvinphos	CE273	N	100	µg/kg	< 100	< 100
Triadimefom	CE273	N	100	µg/kg	< 100	< 100
Triazafos	CE273	N	100	µg/kg	< 100	< 100
TRIAZINES						
Ametryn	CE275	N	10	µg/kg	< 10.0	< 10.0
Atrazine	CE275	N	10	µg/kg	< 10.0	< 10.0
Atraton	CE275	N	10	µg/kg	< 10.0	< 10.0
Prometon	CE275	N	10	µg/kg	< 10.0	< 10.0
Prometryn	CE275	N	10	µg/kg	< 10.0	< 10.0
Propazine	CE275	N	10	µg/kg	< 10.0	< 10.0
Trietazine	CE275	N	10	µg/kg	< 10.0	< 10.0
Simazine	CE275	N	10	µg/kg	< 10.0	< 10.0
Simetryn	CE275	N	10	µg/kg	< 10.0	< 10.0
Terbuthylazine	CE275	N	10	µg/kg	< 10.0	< 10.0
Terbutryn	CE275	N	10	µg/kg	< 10.0	< 10.0

SOIL SVOCS

Lab Number					35756	35757	35758	35759	35760
Sample ID					WS2	TP16	TP2	TP11	TP14
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.30	0.00 - 0.20	0.00 - 0.20
Sampling Date					12/02/2025	12/02/2025	12/02/2025	12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**					
SVOC									
Phenol	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Xylenols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

SOIL SVOCS

Lab Number					35761	35762	35763
Sample ID					TP17	TP20	WS1
Depth (m)					0.00 - 0.20	0.00 - 0.20	0.00 - 0.50
Sampling Date					12/02/2025	12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**			
SVOC							
Phenol	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Cresols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Xylenols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Naphthols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Trimethylphenols	CE189	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10

LEACHATE

Lab Number					35760	35763
Sample ID					TP14	WS1
Depth (m)					0.00 - 0.20	0.00 - 0.50
Sampling Date					12/02/2025	12/02/2025
Test	**Method**	**Accred**	**LoD**	**Units**		
Metals						
Arsenic 2:1	CE265	N	0.1	µg/l	0.41	0.65
Barium	CE265	N	0.9	µg/l	12.4	14.6
Cadmium	CE265	N	0.1	µg/l	< 0.10	< 0.10
Chromium	CE265	N	0.5	µg/l	< 0.50	0.51
Copper	CE265	N	0.6	µg/l	1.30	2.88
Mercury	CE265	N	0.05	µg/l	< 0.050	< 0.050
Molybdenum	CE265	N	0.9	µg/l	< 0.90	1.53
Nickel	CE265	N	0.4	µg/l	< 0.40	0.56
Lead	CE265	N	0.6	µg/l	< 0.60	< 0.60
Antimony	CE265	N	0.8	µg/l	2.40	< 0.80
Selenium	CE265	N	1.1	µg/l	< 1.10	1.21
Zinc	CE265	N	3	µg/l	10.0	21.2
Arsenic 8:1	CE265	N	0.1	µg/l	0.97	< 0.10
Barium 8:1	CE265	N	0.9	µg/l	4.05	5.73
Cadmium 8:1	CE265	N	0.1	µg/l	< 0.10	0.11
Chromium 8:1	CE265	N	0.5	µg/l	1.06	< 0.50
Copper 8:1	CE265	N	0.6	µg/l	3.82	< 0.60
Mercury 8:1	CE265	N	0.05	µg/l	< 0.05	< 0.05
Molybdenum 8:1	CE265	N	0.9	µg/l	< 0.90	< 0.90
Nickel 8:1	CE265	N	0.4	µg/l	1.07	0.66
Lead 8:1	CE265	N	0.6	µg/l	0.77	< 0.60
Antimony 8:1	CE265	N	0.8	µg/l	< 0.80	< 0.80
Selenium 8:1	CE265	N	1.1	µg/l	< 1.10	< 1.10
Zinc 8:1	CE265	N	3	µg/l	186	59.6
Arsenic 2:1	CE265	N	0.0002	mg/kg	0.0008	0.0013
Barium	CE265	N	0.0018	mg/kg	0.0247	0.0292
Cadmium	CE265	N	0.0002	mg/kg	< 0.0002	< 0.0002
Chromium	CE265	N	0.001	mg/kg	< 0.001	0.001
Copper	CE265	N	0.0012	mg/kg	0.0026	0.0058
Mercury	CE265	N	0.0001	mg/kg	< 0.0001	< 0.0001

LEACHATE

Lab Number					35760	35763
Sample ID					TP14	WS1
Depth (m)					0.00 - 0.20	0.00 - 0.50
Sampling Date					12/02/2025	12/02/2025
Molybdenum	CE265	N	0.0018	mg/kg	< 0.0018	0.0031
Nickel	CE265	N	0.0008	mg/kg	< 0.0008	0.0011
Lead	CE265	N	0.0012	mg/kg	< 0.0012	< 0.0012
Antimony	CE265	N	0.0016	mg/kg	0.0048	< 0.0016
Selenium	CE265	N	0.0022	mg/kg	< 0.0022	0.0024
Zinc	CE265	N	0.006	mg/kg	0.020	0.042
Arsenic 10:1	CE265	N	0.001	mg/kg	0.009	0.001
Barium 10:1	CE265	N	0.009	mg/kg	0.044	0.061
Cadmium 10:1	CE265	N	0.001	mg/kg	< 0.001	0.001
Chromium 10:1	CE265	N	0.005	mg/kg	0.010	< 0.005
Copper 10:1	CE265	N	0.006	mg/kg	0.037	< 0.006
Mercury 10:1	CE265	N	0.0005	mg/kg	< 0.0005	< 0.0005
Molybdenum 10:1	CE265	N	0.009	mg/kg	< 0.009	< 0.009
Nickel 10:1	CE265	N	0.004	mg/kg	0.010	0.007
Lead 10:1	CE265	N	0.006	mg/kg	0.007	< 0.006
Antimony 10:1	CE265	N	0.008	mg/kg	< 0.008	< 0.008
Selenium 10:1	CE265	N	0.011	mg/kg	< 0.011	< 0.011
Zinc 10:1	CE265	N	0.03	mg/kg	1.78	0.58
Colourimetric						
Chloride 2:1	CE257	N	0.4	mg/l	3.90	2.60
Fluoride 2:1	CE257	N	0.08	mg/l	0.100	0.900
Sulphate 2:1	CE257	N	0.3	mg/l	< 0.300	105
Phenol Index	CE148	N	0.01	mg/l	< 0.010	< 0.010
Chloride 8:1	CE257	N	0.4	mg/l	< 0.40	< 0.40
Fluoride 8:1	CE257	N	0.08	mg/l	0.100	0.800
8:1 Sulphate 8:1	CE257	N	0.3	mg/l	< 0.300	19.1
Phenol Index 8:1	CE148	N	0.01	mg/l	< 0.010	< 0.010
Chloride	CE257	N	0.8	mg/kg	7.80	5.20
Fluoride	CE257	N	0.16	mg/kg	0.200	1.80
Sulphate	CE257	N	0.6	mg/kg	< 0.60	209
Phenol Index	CE148	N	0.02	mg/kg	< 0.020	< 0.020
Chloride 10:1	CE257	N	4	mg/kg	< 4.0	< 4.0
Fluoride 10:1	CE257	N	0.8	mg/kg	1.00	8.05

LEACHATE

Lab Number					35760	35763
Sample ID					TP14	WS1
Depth (m)					0.00 - 0.20	0.00 - 0.50
Sampling Date					12/02/2025	12/02/2025
Sulphate 10:1	CE257	N	3	mg/kg	< 3.0	230
Phenol Index 10:1	CE148	N	0.1	mg/kg	< 0.10	< 0.10
Combustion						
Total Dissolved Solids	CE039	N	10	mg/l	42.0	230
Dissolved Organic Carbon	CE247	N	5	mg/l	5.82	< 5.00
Total Dissolved Solids 8:1	CE039	N	10	mg/l	18	90
Dissolved Organic Carbon 8:1	CE247	N	5	mg/l	< 5.00	< 5.00
Total Dissolved Solids	CE039	N	20	mg/kg	83.9	459
Dissolved Organic Carbon	CE247	N	10	mg/kg	11.6	< 10.0
Total Dissolved Solids 10:1	CE039	N	100	mg/kg	192	962
Dissolved Organic Carbon 10:1	CE247	N	50	mg/kg	< 50	< 50
Wet Chem						
pH	CE213	N	0	pH units	7.8	7.9
Conductivity	CE214	N	10	µS/cm	55	302
pH 8:1	CE213	N	0	pH units	8.1	8.0
Conductivity 8:1	CE214	N	10	µS/cm	24	118
WACX						
Leachant Volume - L2	CE002	N	0	l	0.269	0.318
Leachant Volume - L8	CE002	N	0	l	1.25	1.40
Temperature	CE002	N	0	°C	18	18
Dry mass of test portion	CE002	N	0	kg	0.156	0.175
Dry Matter	CE002	N	0	%	78.2	84.8
Dry Matter	CE002	N	0.1	%	78.2	84.8
Eluent Volume	CE002	N	0	l	0.070	0.080
Moisture Content	CE001	N	0.1	%	27.8	17.9
WACY						
Temperature 8:1	CE002	N	0	°C	18	18

WAC Analysis

Lab Ref:	35760					**Landfill Waste Acceptance Criteria Limits**		
Job Number:	25-01431					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Date:	12/02/2025							
Sample ID:	TP14							
Depth (m)	0.00 - 0.20							
Site:	LEAP							
Determinand	**Code**	**Units**	**Result**					
Total Organic Carbon	N	%	1.95			3	5	6
Loss on Ignition	U	%	7.20			--	--	10
Total BTEX	N	mg/kg	< 0.006			6	--	--
Total PCBs (7 congeners)	M	mg/kg	< 0.035			1	--	--
Mineral Oil (>C10-C40 Aliphatic) (EH_CU_1D_AL)	N	mg/kg	< 19			500	--	--
Total (of 17) PAHs	N	mg/kg	< 0.300			100	--	--
pH			5.2			--	>6	--
Acid Neutralisation Capacity (pH4)		mol/kg	< 0.020			--	To be evaluated	
Acid Neutralisation Capacity (pH7)	N	mol/kg	< 0.020			--	To be evaluated	
Eluate Analysis		**Conc in Eluate**		**2:1**	**10:1**	**Council Decision 2003/33/EC**		
		2:1	**8:1**	**mg/kg**	**mg/kg**	**Limit Values mg/kg at L:S 10:1**		
Arsenic (µg/l)	N	0.41	0.97	0.0008	0.009	0.5	2	25
Barium (µg/l)	N	12.40	4.05	0.0247	0.044	20	100	300
Cadmium (µg/l)	N	< 0.10	< 0.10	< 0.0002	< 0.001	0.04	1	5
Chromium (µg/l)	N	< 0.50	1.06	< 0.001	0.010	0.5	10	70
Copper (µg/l)	N	1.30	3.82	0.0026	0.037	2	50	100
Mercury (µg/l)	N	< 0.050	< 0.05	< 0.0001	< 0.0005	0.01	0.2	2
Molybdenum (µg/l)	N	< 0.90	< 0.90	< 0.0018	< 0.009	0.5	10	30
Nickel (µg/l)	N	< 0.40	1.07	< 0.0008	0.010	0.4	10	40
Lead (µg/l)	N	< 0.60	0.77	< 0.0012	0.007	0.5	10	50
Antimony (µg/l)	N	2.40	< 0.80	0.0048	< 0.008	0.06	0.7	5
Selenium (µg/l)	N	< 1.10	< 1.10	< 0.0022	< 0.011	0.1	0.5	7
Zinc (µg/l)	N	10.00	186.00	0.020	1.78	4	50	200
Chloride (mg/l)	N	3.900	< 0.40	7.800	< 4.0	800	15000	25000
Fluoride (mg/l)	N	0.10	0	0.200	1.0	10	150	500
Sulphate (mg/l)	N	< 0.300	< 0.300	< 0.60	< 3.0	1000	20000	50000
Total Dissolved Solids (mg/l)	N	42.00	18.00	83.9	192	4000	60000	100000
Phenol Index (mg/l)	N	< 0.010	< 0.010	< 0.020	< 0.10	1	-	-
Dissolved Organic Carbon (mg/l)	N	5.82	< 5.00	11.6	< 50	500	800	1000

Leach Test Information			
pH	N	7.8	8.1
Conductivity (uS/cm)	N	55	24
Temperature (°C)	N	18	18
Mass of dried test portion (kg)	N	0.156	
Mass of wet test portion (kg)			
Dry Matter (%)	N	78.2	
Moisture (%)			
Material Removed (%)			
Eluate Volume (1) (VE1) Litre	N	0.070	
Eluent Volume (l) L2/L8	N	0.269	1.250

Disclaimer: The Landfill Waste Acceptance Criteria limits in this report are provided for guidance only and values are transcribed from the Council Decision annex 2003/33/EC

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Results will be colour flagged to the lowest threshold value breached. Any assessments made are based on the published results from the Laboratory and make no assessment of uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. Method uncertainty levels Interpretation/assessment is outside the scope of the laboratory's UKAS accreditation.
Moisture Content Calculated on Wet Weight Basis

WAC Analysis

Lab Ref:	35763					**Landfill Waste Acceptance Criteria Limits**		
Job Number:	25-01431					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Date:	12/02/2025							
Sample ID:	WS1							
Depth (m)	0.00 - 0.50							
Site:	LEAP							
Determinand	**Code**	**Units**	**Result**					
Total Organic Carbon	N	%	0.28			3	5	6
Loss on Ignition	U	%	7.21			--	--	10
Total BTEX	N	mg/kg	< 0.006			6	--	--
Total PCBs (7 congeners)	M	mg/kg	< 0.035			1	--	--
Mineral Oil (>C10-C40 Aliphatic) (EH_CU_1D_AL)	N	mg/kg	< 19			500	--	--
Total (of 17) PAHs	N	mg/kg	< 0.300			100	--	--
pH			7.3			--	>6	--
Acid Neutralisation Capacity (pH4)		mol/kg	0.090			--	To be evaluated	
Acid Neutralisation Capacity (pH7)	N	mol/kg	< 0.020			--	To be evaluated	
Eluate Analysis		**Conc in Eluate**		**2:1**	**10:1**	**Council Decision 2003/33/EC**		
		2:1	**8:1**	**mg/kg**	**mg/kg**	**Limit Values mg/kg at L:S 10:1**		
Arsenic (µg/l)	N	0.65	< 0.10	0.0013	0.001	0.5	2	25
Barium (µg/l)	N	14.60	5.73	0.0292	0.061	20	100	300
Cadmium (µg/l)	N	< 0.10	0.11	< 0.0002	0.001	0.04	1	5
Chromium (µg/l)	N	0.51	< 0.50	0.001	< 0.005	0.5	10	70
Copper (µg/l)	N	2.88	< 0.60	0.0058	< 0.006	2	50	100
Mercury (µg/l)	N	< 0.050	< 0.05	< 0.0001	< 0.0005	0.01	0.2	2
Molybdenum (µg/l)	N	1.530	< 0.90	0.0031	< 0.009	0.5	10	30
Nickel (µg/l)	N	0.56	0.66	0.0011	0.007	0.4	10	40
Lead (µg/l)	N	< 0.60	< 0.60	< 0.0012	< 0.006	0.5	10	50
Antimony (µg/l)	N	< 0.80	< 0.80	< 0.0016	< 0.008	0.06	0.7	5
Selenium (µg/l)	N	1.21	< 1.10	0.0024	< 0.011	0.1	0.5	7
Zinc (µg/l)	N	21.20	59.60	0.042	0.58	4	50	200
Chloride (mg/l)	N	2.600	< 0.40	5.200	< 4.0	800	15000	25000
Fluoride (mg/l)	N	0.90	1	1.800	8.1	10	150	500
Sulphate (mg/l)	N	105.00	19	209.00	230	1000	20000	50000
Total Dissolved Solids (mg/l)	N	230.00	90.00	459.0	962	4000	60000	100000
Phenol Index (mg/l)	N	< 0.010	< 0.010	< 0.020	< 0.10	1	-	-
Dissolved Organic Carbon (mg/l)	N	< 5.00	< 5.00	< 10.0	< 50	500	800	1000
Leach Test Information								
pH	N	7.9	8.0					
Conductivity (uS/cm)	N	302	118					
Temperature (°C)	N	18	18					
Mass of dried test portion (kg)	N	0.175						
Mass of wet test portion (kg)								
Dry Matter (%)	N	84.8						
Moisture (%)								
Material Removed (%)								
Eluate Volume (1) (VE1) Litre	N	0.080						
Eluent Volume (l) L2/L8	N	0.318	1.400					

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Moisture Content Calculated on Wet Weight Basis

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
CE265	Metals by ICP in 2:1 WAC	ICPMS	As submitted sample
CE002	WAC in leachates 2:1 two stage	BS12457-3	As submitted sample
CE250	GCXGC in Solids	DCM Extraction and GCxGC-FID	As submitted sample
CE257	Anions in 2:1 WAC	Gallery Discrete Analyser/IC	As submitted sample
CE148	Phenols in 2:1 WAC	Continuous Flow Analyser	As submitted sample
CE247	DOC in 2:1 WAC	FORMACS TOC Analyser	As submitted sample
CE002	WAC in leachates 10:1 two stage	BS12457-3	As submitted sample
CE002	WAC moistures	Gravimetric	As submitted sample
SUBCON	Asbestos Solid	HSG248	Air Dried Sample
CE061	W. Sol Metals	ICPOES	Air dried sample
CE265	Metals by ICP in 8:1 WAC	FORMACS TOC Analyser	As submitted sample
CE083	Acid Neutralisation Capacity	Titration	Air dried sample
CE257	Anions in 8:1 WAC	Gallery Discrete Analyser/IC	As submitted sample
CE039	WAC in leachates 8:1 two stage	BS12457-3	As submitted sample
CE148	Phenols in 8:1 WAC	Continuous Flow Analyser	As submitted sample
CE247	DOC in 8:1 WAC	FORMACS TOC Analyser	As submitted sample
CE137	PCB's in Soil	DCM Extraction and GCMS	As submitted sample
CE189	SVOC in solids	DCM Extraction and GCMS	As submitted sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE267	BTEX in solids	Analysis by HSGCFID	As submitted sample
CE263	ChromiumVI by Discrete Analyser in Solid	Gallery	Air dried sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE078	Phenols in Solids	Continuous Flow Analyser	As submitted sample
CE077	Cyanides in Solids	Continuous Flow Analyser	As submitted sample
CE167	Sulphide in Solids	Distillation and titration	Air dried sample
CE197	Primacs in Solids	Primacs	Air dried sample
CE006	Loss on ignition at 440 deg C	Gravimetric	Air dried sample
CE162	Mineral Oil in Solids	Acetone:Hexane extract, Floriil clean up and GCFID	As submitted sample

REPORT INFORMATION

Report No.:25-01431, issue number 1

Key	
U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

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

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Statement of Conformity

Statement of Conformity

Where Chemtech reports a statement of conformity to a specification, the decision rules applied are derived from the Ilac document ILAC G8:09/2019.

Acceptance limits (AL), applied are derived from the tolerance limits (TL) by you the client or applicable standard (e.g. 2003.33.EC Council Decision, BS3882, BS8601)

Agreed and reported Decision Rule:

"PASS" if the result < TL, and the bias / precision values for the process meet the targets defined within the methodology and/or applied accreditation.

Reported Decisions:

Result < TL for determinands: PASS

Result > TL for determinands: FAIL

Definitions Used:

Acceptance limit (AL) Specified upper or lower bounds of permissible measured quantity values.

Tolerance limit (TL) Specified upper or lower bound of permissible values of a property.

Accreditation of WAC/BS3882/BS8601

Accreditation in Soil to MCERTS is only applicable for specific matrix types identified as soil (Sand/Loam/Clay) during the sample assessment

If the sample is classified as not soil, not accreditation is conveyed

APPENDIX I – APPROACH TO THE SELECTION OF GENERIC ASSESSMENT CRITERIA

Chronic Risks to Human Health

Defra and the EA have published a limited number of Soil Guideline Values (SGVs)[19] that represent minimal chronic risk to human health. CL:AIRE has published a limited number of Category Four Screening Levels (C4SLs)[20] which represent a low but still strongly precautionary level of chronic risk to human health. Both the SGVs and C4SLs have both been derived for a Soil Organic Matter (SOM) content of 6%, which is not always representative of the low SOM that are encountered within Made Ground on brownfield sites.

Land Quality Management Ltd. (LQM) responded to the demand for a more comprehensive set of screening values and for a wider range of SOM by producing Suitable for Use Levels (S4ULs)[21] which are a hybrid of SGVs and C4SLs. The S4ULs have been endorsed by the Chartered Institute of Environmental Health (CIEH).

A smaller set of 35 GACs was published by CL:AIRE in association with AGS and EIC in 2010. These were based on the exposure scenarios that were used to derive the SGVs. These exposure scenarios have since been superseded, in part, by the publication of the C4SLs and the S4ULs. A second phase of C4SLs is currently under development.

LEAP uses C4SLs where they are available as generic assessment criteria to quantitatively assess the potential chronic risks to human health. Where C4SLs are not available, the S4ULs or CL:AIRE GACs are used. It is noted that S4ULs are not equivalent to C4SLs in all their exposure assumptions but are generally more conservative. To ensure the greatest possible consistency in LEAP's human health GQRAs, the physicochemical and toxicological input parameters that were used to derive the CL:AIRE GACs have been re-modelled using the exposure parameters selected by LQM to derive the S4ULs.

For the organic compounds benzene and benzo(a)pyrene) for which C4SLs are available for a SOM of 6% only, LEAP has calculated equivalent C4SLs for 1% and 2.5% SOM. SOM does not affect the inorganic contaminants.

[19] Environment Agency Science Report SC050021 series.

[20] CL:AIRE Final Project Report. 'SP1010 – Development of Category 4 Screening Levels for assessment of land affected by contamination'. CL:AIRE, December 2013

[21] 'The LQM/CIEH S4ULs for Human Health Risk Assessment', Nathaniel P et al, 2015. Copyright Land Quality Management Ltd, reproduced with permission: Publication Number S4UL3509.

In accordance with current Public Health England (PHE) guidance[22], LEAP carries out the assessment of PAHs using a surrogate marker approach, whereby the assessment of risk from benzo(a)pyrene also captures potential risks from other carcinogenic PAHs that may be present. The alternative S4ULs for PAHs using the Toxic Equivalent Factor (TEF) approach are not used because this approach is likely to under predict the true carcinogenicity of PAHs and is not advocated by PHE. The threshold PAHs have been assessed similarly, by using naphthalene as a marker compound due to its high volatility relative to other PAHs.

Total phenols are assessed by LEAP against the S4UL for phenol and total chromium is assessed against the S4UL for trivalent chromium.

LEAP does not consider the theoretical soil saturations in the evaluation of organic compounds and as such, some of the S4ULs for the less sensitive exposure scenarios are lower than their more sensitive equivalents.

Risks to human health from inhalation of vapours derived from groundwater are evaluated by LEAP using the SoBRA groundwater GAC_{gwvap}[23].

Acute Risks to Human Health

Cyanide has not been modelled using CLEA because it has high acute toxicity and CLEA is designed to evaluate chronic risks. Assuming an acute risk and based on a single dose of 3 g of soil, an assessment criterion of 33 $mgkg^{-1}$ free inorganic cyanide and 544 $mgkg^{-1}$ complex cyanide has been calculated by LEAP. At this stage LEAP has chosen to adopt a conservative screening value of 20 $mgkg^{-1}$ for total cyanide (essentially the sum of free and complex cyanides) to highlight any potential risks to human health.

Risks to Controlled Waters

RTM (2006)[24] requires receptor-specific Water Quality Standards (WQS) to be used to determine potentially unacceptable risks to water bodies in England and Wales. It requires appropriate criteria to be taken from a hierarchy of sources, where they are available as follows:

1. UK published values

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[22] HPA 'Contaminated Land Information Sheet. Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)'. Public Health England, 2017.

[23] Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' Version 1.0. February 2017.

[24] EA 'Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination' 2006.

2. EU published values
3. WHO published values

Drinking Water Resources

For groundwater and surface waters that are abstracted for potable supply LEAP uses:

- UK Drinking Water Quality Standards (DWS) from *The Water Supply (Water Quality) Regulations* 2016 (England)
- The Water Supply (Water Quality) Regulations 2010 (Wales) as amended in 2016
- World Health Organisation *Guidelines for Drinking Water Quality*, Fourth Edition, Volume 1, (2011).

Where the groundwater is not abstracted for potable supply, this is a precautionary approach which protects the potential future exploitation of the groundwater.

Surface Water (Ecological) Receptors

For surface waters as ecological receptors, LEAP uses the Environmental Quality Standards (EQS) from The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. There are no appropriate EU or WHO standards available.

Petroleum Hydrocarbons

There are no current UK standards available for petroleum hydrocarbons, either for groundwater or surface water receptors, so an initial assessment criterion of 10µg/l, based on the former target concentration for dissolved or emulsified hydrocarbons, is used to represent a conservative preliminary screening value for total petroleum hydrocarbons.

Where considered appropriate, LEAP then follows the guidance of CL:AIRE 2017[25] for the further assessment of the petroleum hydrocarbon fractions and derivatives. For a drinking water resource, the WHO guidelines are used. For surface waters as ecological receptors, proxy compounds are used to select appropriate EQS based on recommended indicator compounds, as follows:

- aromatic EC5-EC7 – benzene
- aromatic >EC7-EC8 – toluene
- aromatic >EC8-EC10 – ethylbenzene

[25] CL:AIRE, 2017. 'Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies'. CL:AIRE, London. ISBN 978-1-905046-31-7.

- aromatic >EC10-EC12 – naphthalene
- aromatic >EC12-EC16 – no proxy
- aromatic >EC16-EC21 – anthracene
- aromatic >EC21-EC35 – benzo(a)pyrene.

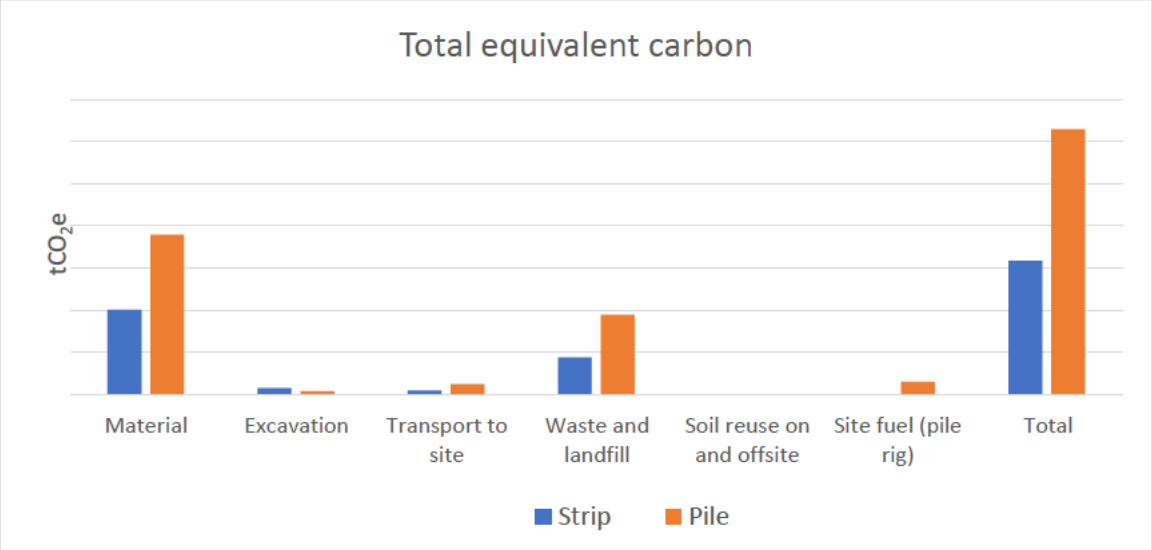
APPENDIX J – CREDIT CARBON ASSESSMENT

CReDiT - Carbon Assessment of Parameters

Comparison of embodied carbon for strip and pile foundations for a development.

Site input parameters

Site properties included	All properties		
Geology	Topsoil to 0.3m, No Made Ground Natural Soil: Clay (High PI) to 2.6m, Shales to 4m, Sand to 0m		
Concrete selected	Unreinforced, C30/37 UK average ready-mixed concrete (35% cement replacement) EPD		
Strip	width (m)	depth (m)	reinforced
	0.6	*2*	*yes*
Pile	Diameter (m)	Depth (m)	Pile mat depth (m)
	0.4	*15*	*0.6*
Onsite soil reuse	0% Topsoil, 0% Clay (High PI), 0% Shales, 0% Sand		
Offsite soil reuse	0% Topsoil, 0% Clay (High PI), 0% Shales, 0% Sand		



Strip foundations **therefore use less equivalent carbon**

Critical carbon depth = 2.2m

i.e. depth of strip foundation with equivalent carbon footprint to pile option

Strip foundations deeper than the critical carbon depth use more equivalent carbon than the piled solution

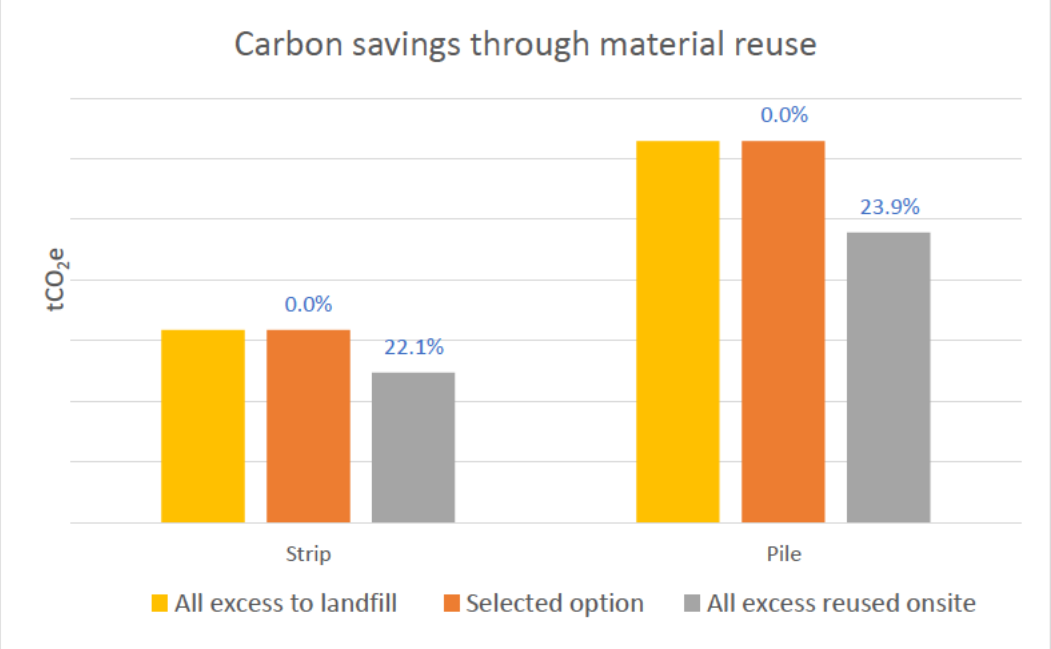
Significant carbon savings can be achieved using alternative concretes, e.g.

Unreinforced, C32/40 UK 50% GGBS cement replacement EPD

Unreinforced, C32/40 UK 75% GGBS cement replacement EPD

Further carbon savings

Material reuse: This compares the results for the selected material reuse options to the worst case scenario – of all excess material going to landfill. It also shows the potential further carbon savings that can be made if all excess material is reused onsite.



The maximum potential carbon savings for the site development and selected foundations were evaluated. These are shown progressively as % savings for :

1. all material being reused onsite
2. HVO fuel used for site operations
3. Optimum low carbon concrete selected (Unreinforced, C32/40 UK 75% GGBS cement replacement EPD).

