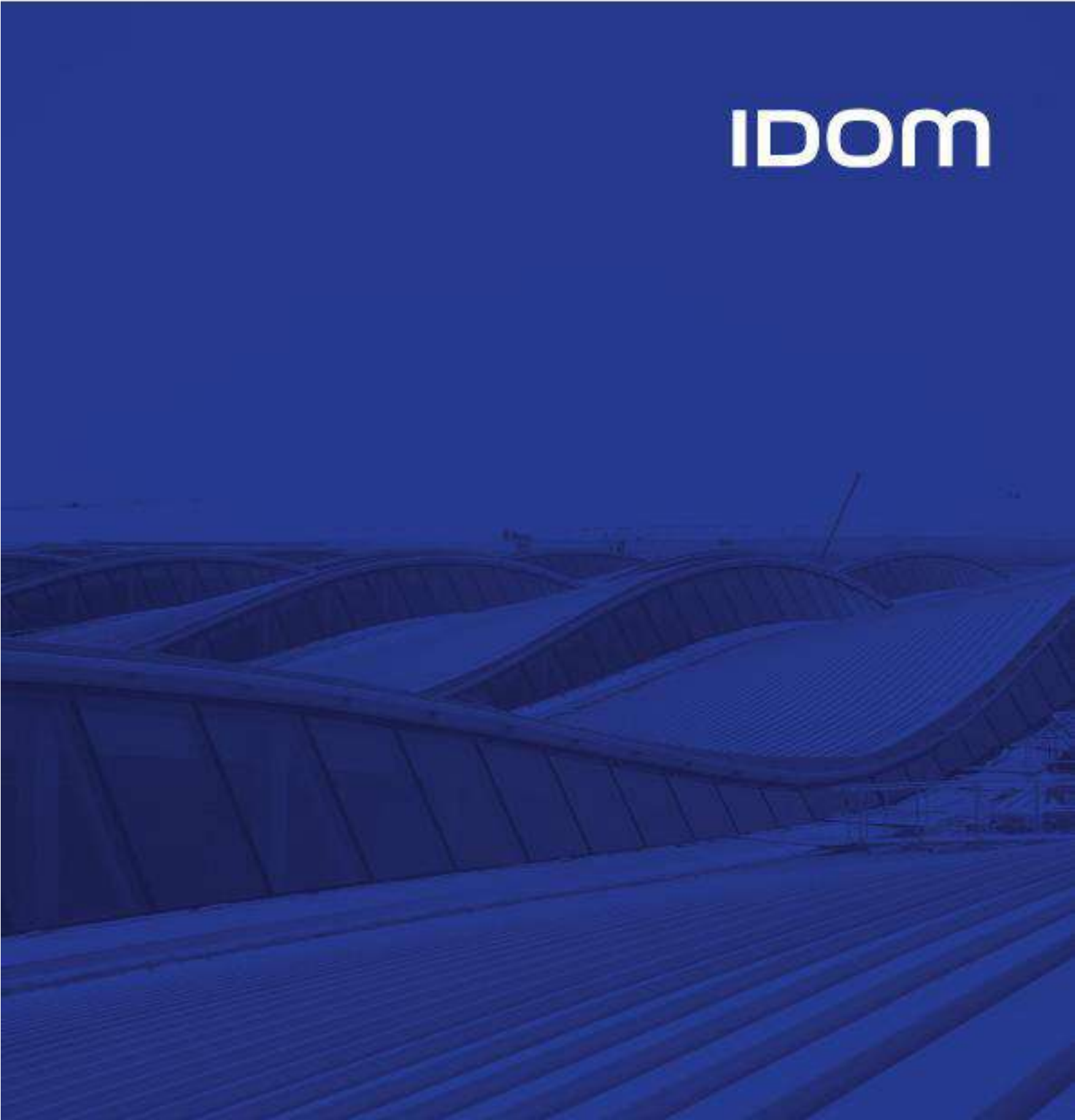


**SUPPLEMENTARY GEOENVIRONMENTAL ASSESSMENT
IMBERHORNE LANE - PARCEL A
EAST GRINSTEAD
VISTRY
GEA-21949BA-25-14
JANUARY 2025**

IDOM



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EXECUTIVE SUMMARY

A Supplementary Geoenvironmental Assessment was requested by Vistry. The purpose of the assessment was to identify any contaminative or geotechnical issues associated with former land use at *Imberhorne Lane - Parcel A, East Grinstead* which might impact on the sites purchase and redevelopment.

SITE DETAILS							
Approximate Area (ha)	Centred on OSGB Eastings, Northings	Previous Use(s)		Current Use		Proposed Use	
1.25	537393, 138611	Agricultural field		Agricultural field		Residential	

PHASE 1 NON-INTRUSIVE INVESTIGATION							
Geology			Groundwater Aquifer		Surface Water	Radon	Flood Risk
Made Ground	Superficial	Solid	Superficial	Solid	A stream is present approximately 20 m west of the site	RnC1	Rivers and sea: Negligible
Made ground unlikely to be present	None recorded	Upper Tunbridge Wells Sand	No superficial deposits on site	Tunbridge Wells Sand Formation is classed as a Secondary A Aquifer			Surface water: Very low
							Groundwater: Negligible

PHASE 2 INTRUSIVE INVESTIGATION					
Geology			Contamination		Waste Classification
Made Ground	Superficial	Solid	Source ► Pathway ► Receptor		
Topsoil – no made ground	None recorded on site. Potential alluvial deposits in vicinity of the stream west of site.	Tunbridge Wells Sand Formation	Significant contamination was not encountered.		VERY LOW
			Ground gas generation potential of on-site soils is low, however historical off-site landfills could pose a risk. Preliminary monitoring at location closest to off-site source suggests very low ground gas. Monitoring programme is ongoing		MODERATE / LOW
Geotechnical					
Foundations		Buried Concrete	Roads and Pavement		Soakaway
An allowable bearing pressure has been provided for strip footings founded at a minimum depth of 0.9m within the granular Tunbridge Wells Sand Formation		DS1 AC-2z	A design value of 4.5% CBR has been recommended based on the three tests undertaken as a part of this investigation		Soakaways are deemed possible to work on this site, however no infiltration tests were undertaken as a part of this investigation and discharge of water to ground or at surface of greater than >5m³ a day require consultation with the regulator.

RECOMMENDATIONS		
Remediation	Waste / Re-use	Geotechnical
No remediation for the protection of human health required. Hazardous ground gas monitoring programme in progress and the ground gas risk assessment will updated in a separate cover upon completion.	Natural as-dug arisings (excluding topsoil) can be classed as inert waste without the requirement for WAC testing. If re-use of site won soils is proposed, it is recommended that a Materials Management Plan is prepared to ensure the resource status of soils is clearly defined.	Footings must be founded within the Tunbridge Wells Sand Formation; greater bearing capacities are achievable if the footings are deepened to 2.0m bgl and footings which expose both cohesive and granular soils should be reinforced.

SECTION 1 INTRODUCTION

- 1.1 Vistry proposes to develop areas of land located off Imberhorne Lane, East Grinstead, RH19 1TX for residential purposes. Vistry are assessing the site as three separate land parcels. The three parcels are known as: *Parcel A*, *Parcel B* and *Remaining Areas*. This report refers to Parcel A.
- 1.2 A site location plan (Ref: 21949ba-304-002) is presented in Appendix 1 showing the intrusive investigation locations and the position of Parcel A within the wider proposed development plan. The wider proposed development is to comprise:
- i. 550 residential houses;
 - ii. A local centre;
 - iii. A Care village;
 - iv. A new primary school, and;
 - v. Playing fields for Imberhorne School.
- 1.3 The proposed development for Parcel A is for low rise residential houses. The exact layout and number of houses is yet to be determined.
- 1.4 IDOM Merebrook Limited (IDOM) has been commissioned by Vistry to undertake supplementary site investigation works and to advise on the geo-environmental implications of the redevelopment of the site for the proposed end use.
- 1.5 The objectives of the investigation are to:
- i. Further assess surface and sub-surface ground conditions present at the site;
 - ii. Identify hazards associated with ground contamination which may place constraints on the site and the proposed development;
 - iii. Evaluate the risks associated with any identified hazards;
 - iv. Provide additional recommendations for the mitigation of any significant risks identified; and
 - v. Provide additional preliminary geotechnical recommendations.
- 1.6 The following reports have previously been undertaken for the subject site. A Tier 1 Preliminary Risk Assessment (Non-Intrusive Investigation) and Tier 2 Generic Quantitative Risk Assessment (Preliminary Exploratory Investigation) and have been referenced below and referred to throughout the report:
- i. Geoenvironmental & Geotechnical Desktop Study, Land at Imberhorne Farm, ref:13694-CRH-XX-XX-RP-LQ-7501_DTS, June 2022, Campbell Reith Hill LLP; and
 - ii. Phase II Geo-Environmental Site Assessment, Land at Imberhorne Farm, East Grinstead, RH19 1TX ref: A118987/1.1, December 2022, Omnia.

- 1.7 This report presents the findings of the IDOM investigation and provides an interpretation of the geo-environmental conditions that exist at the site. The contaminative status of the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment. This report follows LCRM (Land Contamination Risk Management) guidance to appraise land contamination hazards associated with the site.
- 1.8 This report has been prepared for Vistry for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Vistry and IDOM as to the extent to which the findings may be appropriate for their use.

SECTION 2 TIER 1 (NON-INTRUSIVE INVESTIGATION)

2.1 INTRODUCTION

- 2.1.1 A desk study has been undertaken for the wider site (Parcels A, B and Remaining Areas) by Campbell Reith Hill LLP (Ref: 13694-CRH-XX-XX-RP-LQ-7501_DTS); dated June 2022. The desk study has been reviewed and pertinent information for Parcel A has been incorporated into a revised desk study for Parcel A below.

2.2 SITE SETTING

- 2.2.1 The site (Parcel A) occupies an area of approximately 1.25 hectares located at National Grid Reference 537393, 138611. The site dips down to the northwest towards a stream (known as Eden Brook) located just off site to the west of Parcel A which runs north-south with a flow towards the north. An approximate elevation change of 15m was noted by IDOM across the site with the highest point located in the southeastern corner of the site.
- 2.2.2 To the north of the site the arable field extends with an industrial estate and a school academy beyond. East of the site lie arable fields with residential dwellings beyond. South of the site lies a tarmac track and a complex of houses known as Imberhorne Cottages which also contain listed buildings and several small workshops, beyond which a private garden containing a lake was noted (known as Weir Wood Reservoir Eutrophic Lake). Immediately to the west of the site was Eden Brook which was indicated within the field boundary/hedgerow which ran northwards beyond which, further west, lie arable fields.
- 2.2.3 IDOM reviewed the historical maps presented in the desk study for evidence of historical contamination sources on the site and surrounding areas. The earliest historical maps indicate the site has been in use as agricultural land since at least 1874 with no significant changes throughout that time.
- 2.2.4 An off-site water feature (known as Weir Wood Reservoir Eutrophic Lake) was indicated in the desk study which is approximately 50 m south and upstream of Parcel A with the outflow stream noted to be running northwards towards Eden Brook (and therefore the site) from the pond.

2.3 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

- 2.3.1 The published geological mapping indicates that the site is underlain directly by the bedrock geology Tunbridge Wells Sand Formation with no overlying superficial deposits. It was noted that Alluvial deposits may be present in the vicinity of the stream west of the site. The Tunbridge Wells Sand Formation is classified as a Secondary A Aquifer. The site is not within a groundwater source protection zone and no groundwater or surface water abstractions are located within 500 m of the site.

- 2.3.2 Within the Groundsure report appended to the desk study, it was noted that discharges of water or liquid waste of more than 5m³ to ground or to surface waters would require consultation with the regulator as the site lies within a SSSI impact risk zone for the SSSI known as Hedgecourt.
- 2.3.3 The risk of surface water flooding is considered to be very low with 1 in 1000 year chance of flooding along the north west boundary of the site. The risk of groundwater flooding is considered to be negligible and the site is not located within an area at risk of flooding from rivers or the sea.
- 2.4 **OTHER POTENTIALLY CONTAMINATIVE USES**
- 2.4.1 Potentially significant environmental issues have been investigated within relevant distances of Parcel A, based on the desk study conducted by Campbell Reith.
- 2.4.2 Three historical landfills are located approximately 25 m south west, 40 m south west and 150 m south of Parcel A. Each of the historical landfills were recorded to have received inert waste material and their licenses were surrendered in 1980;

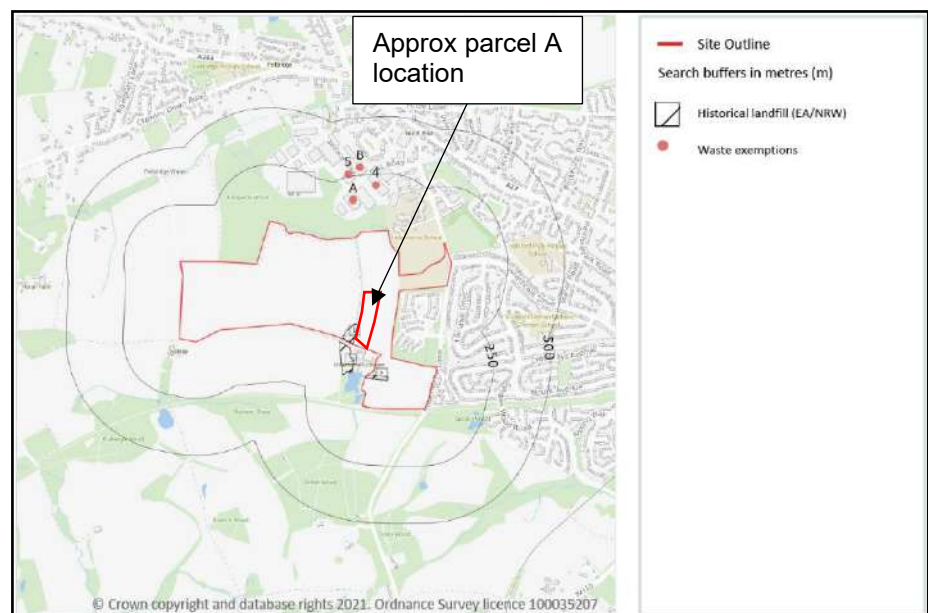


Figure 1-Extract from the Groundsure report included within the Campbell Reith desk study.

- 2.4.3 A vehicle repair, testing and service centre located approximately 50 m south of the site.
- 2.4.4 No water discharge, pollution incidents or statutory authorisations were identified within relevant distances of the site.
- 2.4.5 Given the history of use as an agricultural field the use of pesticides and herbicides may present a source of contamination, although residual concentrations are unlikely to be significant.

2.5 RADON

- 2.5.1 IDOM Merebrook have obtained an up to date (January 2025) radon check of the main site given that radon mapping was updated in December 2022. The latest report confirms that the site is not in a radon affected area (no protection measures are required for radon). However, it is noted that if the proposed development involves an underground room or basement being installed, the property should be tested for radon, despite the area not being affected. The updated radon map is contained within Appendix 2.

2.6 PREVIOUS INTRUSIVE INVESTIGATIONS

- 2.6.1 A Phase 2 Ground Investigation was undertaken for the wider site by Omnia (Ref: A118987/1.1) in December 2022.
- 2.6.2 The investigation conducted within Parcel A comprised the following scope of work:
- i.* Four machine-dug trial holes (TP204 – TP207) to depths of between 1.13 and 1.72 m bgl; and
 - ii.* One Dynamic Cone Penetrometer test (CBR207).
- 2.6.3 Topsoil was encountered at thickness levels between 0.32 m and 0.40 m. Topsoil comprised dark brown gravelly clayey sand with gravels comprised of quartzite. The Tunbridge Wells Sand Formation was encountered at depths between 0.32 and 0.40 m bgl consisting of grey and dark clayey sand, gravelly sand and silty sand with gravels comprising siltstone and sandstone. The base of each trial pit met with refusal at depths between 1.13 and 1.72 m bgl.
- 2.6.4 Within the Omnia investigation two trial pits (TP208 and TP209) were excavated into the nearest inert landfill pocket to the site. These found made ground to extend to 1.50m bgl. The Made Ground comprised of sand and clay containing sandstone, brick concrete, cement and metal. No putrescible materials were recorded within the made ground. However the remaining two inert waste landfill pockets have not been investigated.
- 2.6.5 The historical locations have been marked on the site location drawing (Ref: 21949ba-304-002) presented in Appendix 1
- 2.6.6 No visual or olfactory evidence of contamination was identified.
- 2.6.7 No groundwater strikes were encountered during excavation.
- 2.6.8 One topsoil sample was collected from Parcel A in exploratory hole location TP206 and was submitted for chemical analysis by Omnia and analysed against risk-based criteria protective of a residential development where the consumption of homegrown produce is expected.

- 2.6.9 No exceedances of the applicable screening criteria were encountered in the soil sample.
- 2.6.10 The following observations and recommendations were made by omnia:
- i. Based on the findings of the investigation and plausible linkage pathway, no significant risk to human health was identified and they therefore considered that the soils were suitable for the proposed end use without the need for remedial works. Additional site investigation was recommended to confirm this; and
 - ii. No gas protection measures were specified; however, gas monitoring rounds were recommended to further confirm gas protection measures would not be required.

SECTION 3 UPDATED PRELIMINARY RISK ASSESSMENT

3.1 INTRODUCTION

- 3.1.1 Risk from contamination has been assessed using the source-pathway-receptor and pollutant linkage methodology, whereby a risk can only exist if all elements of: source, pathway and receptor, are present.
- 3.1.2 The level of risk considers the likelihood of the risk occurring and the severity of the potential consequence of that risk using the approach outlined in Appendix 5. As illustrated in Table 1, this updated preliminary risk assessment combines the likelihood and severity of the risk using a Risk Assessment Matrix approach as recommended by CIRIA C552, 2001 and updated in *Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66* published by NHBC, EA and CIEH (2008).

Table 1: Risk assessment matrix (after CIRIA C552 and R&D66)

		MAGNITUDE OF POTENTIAL CONSEQUENCE (SEVERITY) OF RISK			
		SEVERE	MEDIUM	MILD	MINOR
LIKELIHOOD OF RISK	HIGH LIKELIHOOD	Very High Risk	High Risk	Moderate Risk	Low Risk
	LIKELY	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	LOW LIKELIHOOD	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	UNLIKELY	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

3.1.3 For each full pollutant linkage identified in the conceptual model, a risk rating has been assigned and presented in the proceeding sections.

3.2 SOIL CONTAMINATION (HEAVY METALS AND HYDROCARBONS)

3.2.1 No specific on-site sources of contamination have been identified by the desk study and the very limited testing undertaken by others has not identified contamination. However the previous investigation is limited in coverage and therefore a degree of uncertainty remains regarding unidentified contaminants which may impact human receptors via ingestion, dust inhalation and dermal pathways. Whilst specific contaminants have not been identified, common contaminants are heavy metals and hydrocarbons. This degree of uncertainty has been reflected in the risk assessment by raising the likelihood from *unlikely* to *low likelihood* for several of the human receptor linkages.

3.2.2 The risk to future planting schemes is considered to be low due to the lack of evidence for a contamination source but also taking into account uncertainty.

3.2.3 The risk to water supply pipes is considered to be low as no contamination has yet been identified but again, allowing for uncertainty.

3.2.4 The risk to adjacent site users is considered to be very low as dust suppression measures should be employed by any competent contractors.

3.2.5 The risk to the secondary A aquifer is considered to be low due to the lack of apparent contamination source but a degree of uncertainty due to the paucity of data.

3.2.6 The risk to surface waters is considered to be moderate / low with Eden Brook immediately west and downslope of site and with an off-site ancient woodland and a SSSI as potential receptors receiving water from the brook. This risk is from silt and suspended solids rather than from chemical contamination.

3.2.7 The risk to protected habitat are all considered to be very low with the exception of surface water/sediment run-off due to the likelihood of this occurring on the site without interventions and careful surface water management.

3.2.8 Table 2 below summarises the level of risk assigned to each receptor from soil contamination:

Table 2: Risks from soil contamination

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	dust inhalation	low likelihood	minor	VERY LOW
	direct ingestion	unlikely	minor	VERY LOW
	dermal exposure	low likelihood	minor	VERY LOW

Receptor		Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
		ingestion of fruit / vegetables	low likelihood	minor	VERY LOW
Residents of future development		dust inhalation	low likelihood	medium	MODERATE / LOW
		direct ingestion	low likelihood	medium	MODERATE / LOW
		dermal exposure	low likelihood	medium	MODERATE / LOW
		ingestion of fruit / vegetables	low likelihood	medium	MODERATE / LOW
Construction workers		dust inhalation	low likelihood	minor	VERY LOW
		direct ingestion	unlikely	minor	VERY LOW
		dermal exposure	low likelihood	minor	VERY LOW
Future planting		direct uptake of phytotoxic metals	low likelihood	mild	LOW
Water supply pipes		direct contact leading to corrosion / permeation	low likelihood	mild	LOW
Adjacent site users		fugitive dust inhalation	unlikely	minor	VERY LOW
Controlled waters	Aquifer	infiltration / leaching	low likelihood	mild	LOW
	Surface water	run-off from site	low likelihood	medium	MODERATE / LOW
Protected habitat		dust deposition (demolition / construction phase)	unlikely	mild	VERY LOW
		direct ingestion (fauna feeding / drinking)	unlikely	mild	VERY LOW
		dermal exposure (fauna)	unlikely	mild	VERY LOW
		direct contact (flora)	unlikely	mild	VERY LOW
		groundwater flow to hydrologically connected habitat	unlikely	mild	VERY LOW

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
	surface water / sediment run-off	likely	medium	MODERATE

3.1 SOIL CONTAMINATION (ASBESTOS)

3.1.1 The presence of asbestos on this site is considered unlikely as the field has been used for agriculture from 1874 until present. The overall risk is therefore considered to be very low / low.

3.1.2 Table 3 below summarises the level of risk assigned to each receptor from asbestos contamination of soils:

Table 3: Risks from soil contamination (asbestos)

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	inhalation of airborne fibres generated from dry soils	unlikely	mild	VERY LOW
Residents of future development		unlikely	medium	LOW
Construction workers		unlikely	minor	VERY LOW
Adjacent site users		unlikely	minor	VERY LOW

3.2 CONTROLLED WATERS (GROUNDWATER)

3.2.1 As no historical contaminant sources have been identified, groundwater is considered unlikely to be contaminated and therefore surface water is unlikely to receive contamination from the groundwater.

3.2.2 Table 4 below summarises the level of risk to surface water receptors:

Table 4: Risks from groundwater contamination

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Surface water	Aquifer forms basal flow of surface water	unlikely	mild	VERY LOW

3.3 HAZARDOUS GAS

3.3.1 No credible on-site source of ground gas generation has been identified by the desk study. No significant thickness of made ground is expected on site and natural strata are not expected to be significantly gas-generating. However three historical off-site inert landfills have been identified to the south / southwest with potentially permeable

strata between the site and the landfills. These licences were surrendered by 1980 and it is unlikely that there would be sufficient driving force for lateral flow.

3.3.2 The risk of hazardous gas to present site users is considered to be very low as there are no confined spaces on site that gas may collect. Similarly, the risk to construction workers is very low as confined spaces would be under construction. The greatest risk for gas is considered to be the future residents. The risk to adjacent site users from site-derived soil gas is very low as no on-site source of ground gas has been identified.

3.3.3 Table 5 below summarises the level of risk assigned to each receptor from hazardous gas generation:

Table 5: Risks from hazardous gas

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	decomposition of putrescible made ground generating hazardous gas that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations.	unlikely	minor	VERY LOW
Residents of future development		unlikely	severe	MODERATE / LOW
Construction workers		unlikely	minor	VERY LOW
Adjacent site users		unlikely	minor	VERY LOW

3.4 VAPOUR

3.4.1 The risk of VOCs to all receptors is considered to be very low as no source of volatiles has been identified in the desk study.

3.4.2 Table 6 and Table 7 below summarise the level of risk assigned to each receptor from vapour generation:

Table 6: Risks from soil vapour

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Volatilisation of VOCs from contaminated soil generating vapours that can migrate by diffusion or advection via cracks in	unlikely	mild	VERY LOW
Residents of future development		unlikely	mild	VERY LOW

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Construction workers	foundations / utility trenches / service penetrations.	unlikely	mild	VERY LOW
Adjacent site users / general public	Outdoor inhalation in confined excavations / localised spills.	unlikely	mild	VERY LOW

Table 7: Risks from groundwater vapour

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Volatilisation of VOCs from contaminated groundwater generating vapours that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations / localised spills.	unlikely	mild	VERY LOW
Residents of future development		unlikely	mild	VERY LOW
Construction workers		unlikely	mild	VERY LOW
Adjacent site users / general public		unlikely	mild	VERY LOW

3.5 RADON

3.5.1 IDOM Merebrook have obtained an up to date (January 2025) radon check of the main site given that radon mapping was updated in December 2022. The latest report confirms that the site is not in a radon affected area (no protection measures are required for radon).

3.5.2 Table 8 below summarises the level of risk assigned to each receptor from radon:

Table 8: Risks from radon

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Radon generated through decay of uranium in underlying rocks then migration by diffusion through overlying permeable strata and	unlikely	minor	VERY LOW
Residents of future development		unlikely	mild	VERY LOW

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Construction workers	advection into properties via cracks in foundations / utility trenches / service penetrations.	unlikely	minor	VERY LOW

SECTION 4 COMBINED CSM AND RISK ASSESSMENT

- 4.1 The preliminary Conceptual Site Model and Tier 1 Preliminary Risk Assessment have been combined to present the overall risk ratings assigned to each identified source ► pathway ► receptor and is presented in Table 9.

Table 9: Combined Preliminary Conceptual Site Model and Tier 1 Risk Assessment

POTENTIAL CONTAMINANT SOURCE	RELEASE MECHANISM	PATHWAY	EXPOSURE ROUTE	RECEPTOR									
				Present Site Users / General Public	Future Residents / Site Users	Construction Workers	On-Site Planting	Water Supply Pipes	Adjacent Site Users / General Public	Controlled Waters		Protected Habitat	
										Surface Water	Aquifer		
SOIL (HEAVY METALS AND HYDROCARBONS)	▶ DUST	▶ AIR	▶ INHALATION	▶	VERY LOW	MODERATE / LOW	VERY LOW			VERY LOW			VERY LOW
	▶ DIRECT	▶ DIRECT	▶ INGESTION	▶	VERY LOW	MODERATE / LOW	VERY LOW						VERY LOW
	▶ DIRECT	▶ DIRECT	▶ DERMAL EXPOSURE	▶	VERY LOW	MODERATE / LOW	VERY LOW						VERY LOW
	▶ DIRECT	▶ DIRECT	▶ DIRECT CONTACT / UPTAKE	▶				LOW	LOW				VERY LOW
	▶ PLANT UPTAKE	▶ GARDEN FRUIT AND VEGETABLES	▶ INGESTION	▶	VERY LOW	MODERATE / LOW							
	▶ INFILTRATION / LEACHING	▶ GROUNDWATER FLOW	▶ DIRECT	▶								LOW	VERY LOW
	▲▼												
▶ RUNOFF	▶ SURFACE WATER FLOW	▶ DIRECT	▶								MODERATE / LOW		MODERATE
MADE GROUND (ASBESTOS)	▶ FIBRE RELEASE	▶ AIR	▶ INHALATION	▶	VERY LOW	LOW	VERY LOW			VERY LOW			
SOIL (PUTRESCIBLE)	▶ GAS FROM DECOMPOSITION	▶ AIR	▶ INHALATION	▶	VERY LOW	MODERATE / LOW	VERY LOW			VERY LOW			
SOIL (VOC)	▶ VAPOUR FROM VOLATILISATION /	▶ AIR	▶ INHALATION	▶	VERY LOW	VERY LOW	VERY LOW			VERY LOW			
GROUNDWATER (VOC)	▶ VAPOUR FROM VOLATILISATION	▶ AIR	▶ INHALATION	▶	VERY LOW	VERY LOW	VERY LOW			VERY LOW			
GROUNDWATER (DISSOLVED CONTAMINANTS)	▶ DIRECT	▶ BASEFLOW TO SURFACE WATER	▶ DIRECT	▶							VERY LOW		VERY LOW
URANIUM IN UNDERLYING STRATA	▶ RADON FROM RADIOACTIVE DECAY	▶ AIR	▶ INHALATION	▶	VERY LOW	VERY LOW	VERY LOW						

X SOURCE►PATHWAY►RECEPTOR NOT COMPLETE AND NO FURTHER ACTION REQUIRED

SECTION 5 SITE INVESTIGATION RATIONALE

5.1 INTRODUCTION

- 5.1.1 After reviewing the desk study and existing site investigation data IDOM designed a supplementary site investigation to obtain additional environmental and geotechnical data in order to reduce uncertainty. The existing investigation parcel for Parcel A was extremely limited (four trial pits and one CBR), as Parcel A formed a part of a wider site being investigated.
- 5.1.2 Intrusive sampling locations were chosen on the basis of providing broad spatial coverage of Parcel A as no obvious features suggesting contaminative use were identified which required targeted investigation.
- 5.1.3 Groundwater depth measurements and ground gas monitoring were also undertaken. Whilst no specific contaminants of concern were identified by desk study, a suite of common contaminants was applied included heavy metals, hydrocarbons, asbestos, pesticides and herbicides.

5.2 SITE INVESTIGATION METHODS

- 5.2.1 An intrusive investigation was carried out by IDOM on 9 and 16 December 2024 comprising the following scope of work:
- i.* Six shallow windowless sample probe holes (MWS101 to MWS106) to depths of between 1.0 and 2.0 m bgl;
 - ii.* Three machine-dug trial holes (MTP101 to MTP103) to depths of between 1.8 and 2.2 m bgl; and
 - iii.* Three Californian Bearing Ratio tests (MCBR101 to MCBR103).
- 5.2.2 Exploratory hole locations are indicated on drawing 21949ba-304-002 in Appendix 1. Logging of exploratory holes was undertaken by an IDOM Officer. Exploratory hole logs are contained in Appendix 3.
- 5.2.3 A tracked windowless sampling rig was used to advance MWS101 to MWS106. This comprised a rig-mounted drop hammer to drive a hollow steel barrel into the ground. The barrel is recovered along with a removable plastic sleeve, which lines the barrel and holds a core of soil which is retracted for logging and sampling. SPTs were performed at approximate 1 m intervals in all windowless sample holes.
- 5.2.4 Details of monitoring installations in windowless samples are summarised in Table 10.

Table 10: Summary of gas and groundwater monitoring installations

Location Ref	Depth To Top of Response Zone (m bgl)	Depth To Base Of Response Zone (m bgl)	Strata
MWS101	0.7	1.7	Tunbridge Wells Sand Formation.
MWS103	0.85	1.85	
MWS106	0.5	1.0	

- 5.2.5 Representative soil samples were taken from various depths and strata to assess the contaminative status of the site. Soil samples were submitted to an MCERTS/UKAS accredited laboratory for chemical analysis of a broad suite of potential contaminants. The results are provided in Appendix 4.
- 5.2.6 A programme of geotechnical laboratory testing was performed on selected soil samples obtained from the boreholes, comprising classification and strength tests. Chemical testing was also undertaken to assess the aggressiveness of the ground with respect to buried concrete. The results are provided in Appendix 5.

SECTION 6 GROUND CONDITIONS

6.1 SUMMARY

- 6.1.1 At the time of the investigation the site comprised an agricultural field. The surface was covered by sparse crop vegetation.
- 6.1.2 Exploratory hole locations encountered topsoil over Tunbridge Wells Sand Formation which was consistent with the published BGS records.
- 6.1.3 A summary of the ground conditions encountered is presented in Table 11, whilst a more detailed assessment of the strata is contained in the following sections of the report.

Table 11: Summary of sub-surface ground conditions

Strata	Depth to Top of Range (m bgl)	Thickness Range (m)
Topsoil	Surface level	0.2 – 0.6
Tunbridge Wells Sand Formation	0.2 – 0.6	0.5 – 1.9

6.2 TOPSOIL

- 6.2.1 Topsoil was encountered in all exploratory holes. The topsoil was typically described as very soft brown sandy clay / gravelly sandy clay with gravels of flint. Rare inclusions of brick were encountered in the topsoil in MWS103.
- 6.2.2 No visual or olfactory evidence of contamination was encountered in the topsoil.

6.2.3 No perched groundwater was encountered within the topsoil.

6.3 TUNBRIDGE WELLS SAND FORMATION

6.3.1 The Tunbridge Wells Sand Formation was encountered in all exploratory holes. The Tunbridge Wells Sand was typically described near surface as a light-yellow brown sandy silt or as slightly sandy clay.

6.3.2 At depth, the Tunbridge Wells Sand Formation was described as light yellow silty fine sand in some locations which quickly graded into a weak to moderately strong sandstone and siltstone on which the windowless samples met refusal.

6.3.3 Groundwater strikes were recorded within the Tunbridge Wells Sand Formation within MTP101, MTP102, MWS102 and MWS103 between 1.2 and 1.65 m bgl.

6.3.4 No visual or olfactory evidence of contamination was encountered in the Tunbridge Wells Sand Formation.

6.3.5 SPTS undertaken within the Tunbridge Wells Sand Formation recorded 'N' values ranging from 1 to 50 (refusal), Only one SPT test was undertaken in the cohesive soils and recorded a very low SPT 'N' blow count of 1 recorded at 1.0 m bgl in MWS105 indicating very low strength ground conditions. These soils were described as very soft brown sandy clay. The remaining SPT 'N' blow counts were recorded within the cohesive/granular soils recorded blow counts of between 20 and 50 indicative of medium to high strength or medium dense to very dense ground conditions.

6.3.6 A total of five Atterberg Plasticity Limits Tests were undertaken on samples of the cohesive Tunbridge Wells Sand Formation and recorded modified plasticity indices between 10 and 15 classifying the Tunbridge Wells Sand Formation as low volume change potential.

6.3.7 Three particle size distributions were undertaken, two were undertaken on the cohesive Tunbridge Wells Sand Formation to classify proportions of sand and gravel within the cohesive Tunbridge Wells Sand Formation and identified the following range of particle sizes:

Gravel: 0 - 1%

Sand: 2 - 16%

Fines (clay/silt): 83 - 98%

6.3.8 The third particle size distribution was undertaken on samples of the siltstone obtained from MTP102 confirming the presence of siltstone in that locality.

6.3.9 One point load strength test was undertaken on a sample of the sandstone at depth and recorded IS strengths of between 0.14 MPa.

SECTION 7 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

7.1 FOUNDATIONS

- 7.1.1 The proposed development for Parcel A was to comprise residential housing however the exact layout and number of houses was yet to be determined.
- 7.1.2 The intrusive investigation revealed the presence of topsoil over the Tunbridge Wells Sand Formation. The Tunbridge Wells Sand Formation was often encountered as cohesive silt or clay near surface and was indicated to typically have a medium to very high strength. These cohesive soils graded into siltstones and sandstones with depth and had a limited thickness typically persisting to depths of up to 1.50m bgl in MWS105.
- 7.1.3 Beneath the cohesive upper layer of the Tunbridge Wells Sand Formation, sand, sandstone and siltstone were typically encountered. All trial holes met refusal by 2.20m bgl and SPTs typically recorded SPT 'N' blow counts between 20 and 50 indicative medium dense to very dense ground conditions. With the notable exception of MWS105 at 1m which recorded an SPT 'N' of 1. The Tunbridge Wells Sand Formation was thought to be a suitable founding stratum.
- 7.1.4 An allowable bearing pressure of up to 100 kN/m² has been calculated for strip foundations founded at a minimum depth of 0.90 m bgl within the cohesive Tunbridge Wells Sand Formation. Less than 15 mm of total settlement would be anticipated. At this footing depth foundations are likely to span across cohesive and granular ground conditions in some areas of the site. Where this occurs reinforcement mesh should be added to the footings. Foundations must be extended deeper if soft cohesive soils (clay/silt) are exposed at the foundation depth of 0.9 m bgl, particularly around location MWS105.
- 7.1.5 Where the Tunbridge Wells Sand Formation is granular allowable bearing pressures of up to 150 kN/m² are possible and could be achieved by deepening the footings to 2 m bgl provided consistent granular soils and/or weathered rock is present. Anticipated total settlements at this depth would be 20 mm assuming a conservative friction angle of 32 degrees within the granular soils.
- 7.1.6 The final foundation depth must be determined using Chapter 4.2 of the NHBC Standards for building near trees and hedges and extending as necessary. Atterberg limits tests have classified the cohesive soils as low volume change potential. The minimum footing depth of 0.9m was determined as at this depth most of soft clay soils near surface would be bypassed.

7.2 EXCAVATIONS AND GROUNDWATER

- 7.2.1 Groundwater strikes were encountered between 1.2 and 1.5m bgl within the Tunbridge Wells Sand Formation, it is conceivable that in wetter winter months the groundwater table could lead to groundwater flooding of excavation trenches and provision for dewatering should therefore be made.

- 7.2.2 The trial pit excavations were noted to be marginally stable. However unsupported earth faces can collapse without warning and therefore excavations must be adequately supported or battered back prior to entry by personnel.
- 7.3 **FLOOR SLABS**
- 7.3.1 Atterberg plasticity limits tests have classified the Tunbridge Wells Sand Formation as low volume change potential. Suspended floor slabs should therefore be used.
- 7.4 **BURIED CONCRETE**
- 7.4.1 For the purposes of assessing concrete aggressiveness the testing undertaken across the three land parcels (Parcel A, B and Remaining areas) have been considered together. A total of 26 samples were collected across the three parcels, six of which were from Parcel B.
- 7.4.2 Recommendations given in BRE Special Digest 1:2005 "*Concrete in aggressive ground*" have been followed in order to give recommendations with respect to buried concrete.
- 7.4.3 Water soluble sulphate analysis was carried out on twenty-six soil samples obtained from depths of between 0.45 and 3.45 m bgl with soil pH determination also carried out on these samples. Water soluble sulphate contents ranged between 8.3 and 74.3 mg.l⁻¹. In accordance with BRE guidelines the characteristic value is calculated by determining the mean of the highest 20 % of results. In this case the characteristic value is 49.6 mg.l⁻¹. On this basis the Design Sulphate Class is DS1.
- 7.4.4 The pH values in the soil samples varied between 6.2 and 8.2. The mean of the lowest 20 % of values is 6.4 which represents the characteristic value. Mobile groundwater conditions have been assumed and, on this basis, the Aggressive Chemical Environment for Concrete (ACEC) class for the site is AC-2z.
- 7.5 **ROADS AND PAVED AREAS**
- 7.5.1 Three in situ CBR tests were undertaken as a part of this investigation (MCBR101-MCBR103) and recorded CBR percentages of between 4.7 and 6.4% a design CBR percentage of 4.5% would therefore be recommended.
- 7.6 **SOAKAWAYS**
- 7.6.1 Soakaways are possibly viable on this site. No infiltration test were undertaken as a part of these intrusive works. It is worth noting that discharges of water or liquid waste of more than 5m³ to ground or to surface waters would require consultation with regulators as the site lies within a SSSI impact risk zone for the SSSI known as Hedgecourt.

SECTION 8 ENVIRONMENTAL ASSESSMENT – SOIL QUALITY

8.1 RESULTS

- 8.1.1 A total of six soil samples were submitted to the laboratory for chemical analysis, including four samples from topsoil and two samples from natural ground. The laboratory chemical analysis certificates are contained in Appendix 4. The results of the analysis are summarised in Table 12.
- 8.1.2 An initial screening exercise has been undertaken whereby contaminant concentrations recorded in soils have been assessed against *Suitable for Use Levels* (S4ULs) published in 2015 by LQM/CIEH¹. These precautionary screening levels are designed to be representative of minimal risk to human health in a number of land use scenarios. In this report S4ULs have been selected for a residential land use where the possibility of consumption of homegrown produce exists and assuming a soil organic matter of 1 %. For lead the DEFRA Category 4 Screening Level² has been used as this is based on updated toxicological data and a low risk to human health.
- 8.1.3 An additional set of phytotoxin screening levels have been adopted from 'The Code of Agricultural Practice for the Protection of Soil' Ministry of Agriculture, Fisheries and Food (MAFF), 1993, which are protective of healthy plant growth.

Table 12: Summary of soils chemical analysis results

CONTAMINANT	No of Tests	MAX (mg.kg ⁻¹)	MEAN (mg.kg ⁻¹)	SCREENING LEVEL (SL) (mg.kg ⁻¹)	No > SL*
HUMAN HEALTH RISK ASSESSMENT					
Asbestos in soil	4	Not detected		Detected	0
pH	6	8.6	7.3	5 – 9	0
Arsenic	6	8.7	7.2	37	0
Barium	6	44.0	37.2	1300	0
Cadmium	6	0.2	0.2	11	0
Chromium (III)	6	28.0	20.2	910	0
Hexavalent Chromium	6	Below Detection Limit of <1.8		6	0
Lead	6	34.0	21.1	200	0
Mercury	6	Below Detection Limit of <0.3		40	0
Nickel	6	14.0	12.0	130	0
Selenium	6	Below Detection Limit of <1.0		250	0
Vanadium	6	32.0	25.8	410	0

¹ Nathanail, C. P., McCaffrey, C., Gillett, A. G., Ogden, R. C. and Nathanail, J. F. 2015. *The LQM/CIEH S4ULs for Human Health Risk Assessment*. Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3100. All rights reserved. Including August 2015 nickel update.

² SP1010 *Development of Category 4 Screening Levels Main Report* (Dec 2013) and SP1010 *Policy Companion Document* (Mar 2014).

CONTAMINANT	No of Tests	MAX (mg.kg ⁻¹)	MEAN (mg.kg ⁻¹)	SCREENING LEVEL (SL) (mg.kg ⁻¹)	No > SL*
TPH Aliphatic >EC ₅ - EC ₆	6	Below Detection Limit of <0.01		42	0
TPH Aliphatic >EC ₆ - EC ₈	6	Below Detection Limit of <0.001		100	0
TPH Aliphatic >EC ₈ - EC ₁₀	6	Below Detection Limit of <0.01		27	0
TPH Aliphatic >EC ₁₀ - EC ₁₂	6	Below Detection Limit of <1.0		130	0
TPH Aliphatic >EC ₁₂ - EC ₁₆	6	Below Detection Limit of <2.0		1100	0
TPH Aliphatic >EC ₁₆ - EC ₂₁	6	Below Detection Limit of <8.0		65000	0
TPH Aliphatic >EC ₂₁ - EC ₃₅	6	Below Detection Limit of <8.0		65000	0
TPH Aromatic >EC ₅ - EC ₇	6	Below Detection Limit of <0.001		70	0
TPH Aromatic >EC ₇ - EC ₈	6	Below Detection Limit of <0.01		130	0
TPH Aromatic >EC ₈ - EC ₁₀	6	Below Detection Limit of <0.02		34	0
TPH Aromatic >EC ₁₀ - EC ₁₂	6	Below Detection Limit of <1.0		74	0
TPH Aromatic >EC ₁₂ - EC ₁₆	6	Below Detection Limit of <2.0		140	0
TPH Aromatic >EC ₁₆ - EC ₂₁	6	Below Detection Limit of <10.0		260	0
TPH Aromatic >EC ₂₁ - EC ₃₅	6	Below Detection Limit of <10.0		1100	0
Benzene	6	Below Detection Limit of <5.0		0.087	0
Toluene	6	Below Detection Limit of <5.0		130	0
Ethylbenzene	6	Below Detection Limit of <5.0		47	0
Xylene	6	Below Detection Limit of <5.0		56	0
Naphthalene	6	Below Detection Limit of <0.05		2.3	0
Acenaphthylene	6	Below Detection Limit of <0.05		170	0
Acenaphthene	6	Below Detection Limit of <0.05		210	0
Fluorene	6	Below Detection Limit of <0.05		170	0
Phenanthrene	6	0.07	0.07	95	0
Anthracene	6	Below Detection Limit of <0.05		2400	0
Fluoranthene	6	0.14	0.10	280	0
Pyrene	6	0.05	0.05	620	0
Benzo(a)anthracene	6	Below Detection Limit of <0.05		7.2	0
Chrysene	6	Below Detection Limit of <0.05		15	0
Benzo(b)fluoranthene	6	Below Detection Limit of <0.05		2.6	0
Benzo(k)fluoranthene	6	Below Detection Limit of <0.05		77	0
Benzo(a)pyrene	6	Below Detection Limit of <0.05		2.2	0
Indeno(1,2,3-c,d)pyrene	6	Below Detection Limit of <0.05		27	0

CONTAMINANT	No of Tests	MAX (mg.kg ⁻¹)	MEAN (mg.kg ⁻¹)	SCREENING LEVEL (SL) (mg.kg ⁻¹)	No > SL *
Dibenzo(a,h)anthracene	6	Below Detection Limit of <0.05		0.24	0
Benzo(g,h,i)perylene	6	Below Detection Limit of <0.05		320	0
Phenol	6	Below Detection Limit of <1.0		120	0
Pesticides	1	Nd		-	-
Herbicides	1	Nd		-	-
PHYTOTOXICITY RISK ASSESSMENT					
Copper	6	15.0	11.9	200	0
Nickel	6	14.0	12.0	110	0
Zinc	6	49.0	41.8	300	0

Notes: * Number of samples exceeding screening level

nd = not detected

8.2 ZOOTOXIC METALS (HARMFUL TO HUMAN HEALTH)

8.2.1 No exceedances of the applicable screening criteria were encountered.

8.3 PHYTOTOXIC METALS (HARMFUL TO PLANT HEALTH)

8.3.1 No phytotoxic metals were recorded at concentrations in excess of the applicable screening criteria.

8.4 ORGANIC CONTAMINANTS

8.4.1 No exceedances of the applicable screening criteria were encountered.

8.5 INORGANIC CONTAMINANTS

8.5.1 No exceedances of the applicable screening criteria were encountered.

8.6 PESTICIDES / HERBICIDES

8.6.1 Pesticides and herbicides were not identified above the laboratory detection limit in the topsoil sample.

8.7 SUMMARY

8.7.1.1 Contamination was not identified within the topsoil.

8.7.1.2 Contamination was not identified within the natural ground.

SECTION 9 ENVIRONMENTAL ASSESSMENT – GROUNDWATER QUALITY

9.1 RESULTS

- 9.1.1 Groundwater was encountered during drilling and excavation at four locations ranging from 1.2 and 1.65 m bgl. These were typically associated with sandy partitions and bands of claystone / siltstone within the Upper Tunbridge Wells Sand.
- 9.1.2 During subsequent monitoring, standing groundwater was found at levels between 0.45 m and 0.62 m bgl with sufficient volumes of water to enable sampling.
- 9.1.3 Two samples (MWS101 and MWS103) were submitted to the laboratory for analysis of a typical contamination suite. Screening levels for groundwater have been derived from the maximum concentrations set out in the Water Supply (Water Quality) Regulations 2018 (England) where prescribed, or for those determinands not included, the 1989 regulations. The laboratory chemical analysis certificate is contained in Appendix 6 and groundwater level data is contained in Appendix 7. A summary of groundwater contaminant concentrations is contained in Table 13.

Table 13: Summary of groundwater chemical analysis results

Contaminant	Units	Max	Mean	No. Tests	Screen Level (SL)	No. > SL
pH	-	7.4	7.4	2	6.5**	0
Arsenic	µg.l ⁻¹	0.63	0.525	2	10	0
Cadmium	µg.l ⁻¹	<0.02	<0.02	2	5	0
Chromium (total)	µg.l ⁻¹	0.8	0.65	2	50	0
Copper	µg.l ⁻¹	4.4	3.15	2	2000	0
Lead	µg.l ⁻¹	0.3	0.25	2	10	0
Mercury	µg.l ⁻¹	<0.05	<0.05	2	1	0
Nickel	µg.l ⁻¹	3.3	3.15	2	20	0
Selenium	µg.l ⁻¹	0.85	0.9	2	10	0
Zinc	µg.l ⁻¹	2.0	1.45	2	5000	0
Cyanide	µg.l ⁻¹	<10	<10	2	50	0
Sulphate	mg.l ⁻¹	26.9	24	2	250	0
TPH	µg.l ⁻¹	<10	<10	2	10	0
BTEX	µg.l ⁻¹	<1.0	<1.0	2	-	0
PAH (total)	µg.l ⁻¹	<0.16	<0.16	2	-	0
PAH****	µg.l ⁻¹	<0.04	<0.04	2	0.1	0
Benzo(a)pyrene	µg.l ⁻¹	<0.01	<0.01	2	0.01	0
Naphthalene	µg.l ⁻¹	<0.01	<0.01	2	-	0
Phenols	µg.l ⁻¹	<10	<10	2	0.5	0

Notes: * Samples exceeding screen level

** Minimum value applies (i.e. most acid)

*** Not detected above screening level

**** sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene & indeno(1,2,3-cd)pyrene

9.2 DISCUSSION

- 9.2.1 Groundwater contaminant levels were found to be below the respective screening levels or below the limits of detection.

SECTION 10 ENVIRONMENTAL ASSESSMENT - HAZARDOUS GAS

10.1 RESULTS

- 10.1.1 Gas monitoring has been undertaken on two occasions on 18 December 2024 and 8 January 2025. The maximum and steady state levels of methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide were recorded in each standpipe, together with associated parameters including borehole flow and ambient air pressure. The time taken to reach steady state was also recorded.
- 10.1.2 The full results are presented in Appendix 7 and a summary of key readings for each strata monitored are presented in Table 14.

Table 14: Summary of hazardous gas monitoring data with all or part of response zone within the Upper Tunbridge Wells Sand

Monitoring Well Reference				MWS101		
Top of Response Zone (m bgl)				0.7		
Bottom of Response Zone (m bgl)				1.7		
Response Zone Stratum				Upper Tunbridge Wells Sand		
Round	AP (mb)	Flow Max (l.hr ⁻¹)	Flow Steady (l.hr ⁻¹)	Methane Max (% v/v)	Carbon Dioxide Max (% v/v)	Dip to water (m bgl)
1	997	9.6	0.0	0.0	0.3	0.56
2	999	0.0	0.0	0.0	0.4	0.45

Monitoring Well Reference				MWS103		
Top of Response Zone (m bgl)				0.85		
Bottom of Response Zone (m bgl)				1.85		
Response Zone Stratum				Upper Tunbridge Wells Sand		
Round	AP (mb)	Flow Max (l.hr ⁻¹)	Flow Steady (l.hr ⁻¹)	Methane Max (% v/v)	Carbon Dioxide Max (% v/v)	Dip to water (m bgl)
1	997	0.0	0.0	0.0	0.1	0.62
2	1000	0.0	0.0	0.0	0.7	0.60

Monitoring Well Reference				MWS106		
Top of Response Zone (m bgl)				0.5		
Bottom of Response Zone (m bgl)				1.0		
Response Zone Stratum				Upper Tunbridge Wells Sand		
Round	AP (mb)	Flow Max (l.hr ⁻¹)	Flow Steady (l.hr ⁻¹)	Methane Max (% v/v)	Carbon Dioxide Max (% v/v)	Dip to water (m bgl)
1	997	0.0	0.0	0.0	0.9	Dry
2	999	0.0	0.0	0.0	0.5	DRY

10.1.3 The response zones within MWS101 and MWS103 were inundated with water during the time of the two visits and are not considered to be representative. Only the data from MWS106 is considered to be viable for further assessment. It is noted that well MWS106 is positioned on the south of the site at the southernmost extent of proposed housing and is therefore well positioned to assess any impact from the off-site landfills.

10.1.4 The monitoring rounds were undertaken at barometric pressures ranging from 997 to 1000 mb. Positive flow was recorded in MWS101 on one occasion at 9.6 l.hr⁻¹. It is considered likely that this flow rate in this well is a result of changing water levels in the well rather than genuine gas flux from the ground, due to the response zone being saturated. Over the two monitoring rounds methane (CH₄) was not detected, carbon dioxide (CO₂) was detected to a maximum of 0.9 % v/v with a corresponding depleted oxygen concentration of 9.6% v/v.

SECTION 11 ENVIRONMENTAL ASSESSMENT - VAPOUR

11.1 RESULTS

11.1.1 As part of the monitoring, organic vapour measurements were undertaken on 18 December 2024 and 8 January 2025. The maximum and steady state levels of VOCs were recorded using a PID (photo-ionization device) in each standpipe. The time taken to reach steady state was also recorded.

11.1.2 VOC concentrations ranged from 0.3 to 1.2 ppm with the highest concentration recorded at MWS106. This is not considered to be indicative of contamination with volatile organic compounds.

SECTION 12 WASTE CLASSIFICATION, OFF-SITE DISPOSAL OR RE-USE

12.1 WASTE CLASSIFICATION

12.1.1.1 Solid chemical data demonstrates that the site soils are non-hazardous as contaminant concentrations are generally low. Natural as dug arisings (excluding topsoil) could be classed as inert waste without the requirement for WAC testing.

12.1.2 Materials, including waste soils which are not to be retained on site, should be removed and disposed of in accordance with all relevant statutes.

12.1.3 It is a requirement that waste sent to landfill should have been subject to measures to reduce the amount of waste, reduce harmful or hazardous properties and facilitate recycling. These requirements may be satisfied by measures such as segregation and screening of wastes to recover suitable fill and material for crushing, segregation of inert materials and putrescible wastes.

12.2 RE-USE CONSIDERATIONS

12.2.1 As a sustainable alternative to off-site disposal, it may be possible to re-use site-won soils provided the following criteria are met:

- i.* Use of the material will not create an unacceptable risk of pollution to the environment or harm to human health;
- ii.* The material must be chemically and geotechnically suitable without further treatment;
- iii.* There must be certainty of use within the scheme;
- iv.* Material should only be used in the quantity necessary for that use.

12.2.2 Provided these criteria are met, the re-use of site-won materials is unlikely to be deemed a waste activity. Production of a *Materials Management Plan* under the industry *CL:AIRE Code of Practice on the Definition of Waste* represents a robust method of demonstrating that the proposed re-use of material meets the criteria and is not liable for landfill tax.

12.2.3 During excavation and re-use of “*uncontaminated soil and other naturally occurring material*”, an exclusion to waste legislation can apply under the Waste Framework Directive. To qualify for the exclusion, soils must be:

- i.* Uncontaminated;
- ii.* Excavated during the construction activities; and
- iii.* Certain to be used in its natural state for construction purposes on the same site.

12.2.4 Under this exclusion, the definition of uncontaminated soil and other naturally occurring material is as follows:

virgin soil or soil that is equivalent to virgin soil. Other naturally occurring material means soil, stones, gravel, rock, etc.

SECTION 13 GENERIC QUANTITATIVE RISK ASSESSMENT (TIER 2)

13.1 INTRODUCTION

13.1.1 The site investigation has not identified any potentially significant contaminant sources.

13.1.2 The risk assessment has been updated with regard to the following receptors interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment as set out in Section 3 above;

- i.* Present site users;
- ii.* Future residents;
- iii.* Construction workers;
- iv.* Plants used in landscaping;
- v.* Potable water supply pipework;
- vi.* The general public and adjacent site users; and
- vii.* Controlled waters;

13.2 SOIL CONTAMINATION (HEAVY METALS AND HYDROCARBONS)

13.2.1 Significant contamination was not encountered during the investigation.

13.2.2 Table 15 below updates the level of risk assigned to each receptor from soil contamination in light of data gathered during the supplementary investigation:

Table 15: Risks from soil contamination (heavy metals, hydrocarbons, pesticides and herbicides)

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	dust inhalation	unlikely	minor	VERY LOW
	direct ingestion	unlikely	minor	VERY LOW
	dermal exposure	unlikely	minor	VERY LOW
	ingestion of fruit / vegetables	unlikely	minor	VERY LOW
Residents of future development	dust inhalation	unlikely	minor	VERY LOW
	direct ingestion	unlikely	minor	VERY LOW
	dermal exposure	unlikely	minor	VERY LOW

Receptor		Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
		ingestion of fruit / vegetables	unlikely	minor	VERY LOW
Construction workers		dust inhalation	unlikely	minor	VERY LOW
		direct ingestion	unlikely	minor	VERY LOW
		dermal exposure	unlikely	minor	VERY LOW
Future planting		direct uptake of phytotoxic metals	unlikely	minor	VERY LOW
Water supply pipes		direct contact leading to corrosion / permeation	unlikely	minor	VERY LOW
Adjacent site users		fugitive dust inhalation	unlikely	minor	VERY LOW
Controlled waters	Secondary A Aquifer	infiltration / leaching	unlikely	minor	VERY LOW
	Surface water	run-off from site	unlikely	minor	VERY LOW
Protected habitat		dust deposition (demolition / construction phase)	unlikely	minor	VERY LOW
		direct ingestion (fauna feeding / drinking)	unlikely	minor	VERY LOW
		dermal exposure (fauna)	unlikely	minor	VERY LOW
		direct contact (flora)	unlikely	minor	VERY LOW
		groundwater flow to hydrologically connected habitat	unlikely	minor	VERY LOW
		surface water / sediment run-off	unlikely	minor	VERY LOW

13.3 SOIL CONTAMINATION (ASBESTOS)

13.3.1 No asbestos was encountered within the site investigation, therefore overall risk is considered to be very low.

13.3.2 Table 16 below summarises the level of risk assigned to each receptor from asbestos contamination:

Table 16: Risks from soil contamination (asbestos)

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	inhalation of airborne fibres generated from dry soils	unlikely	minor	VERY LOW
Residents of future development		unlikely	minor	VERY LOW
Construction workers		unlikely	minor	VERY LOW
Adjacent site users		unlikely	minor	VERY LOW

13.4 CONTROLLED WATERS (GROUNDWATER)

13.4.1 No groundwater contamination was encountered during the investigation

13.4.2 Table 17 below summarises the level of risk to surface water receptors from contributions from groundwater baseflow:

Table 17: Risks from groundwater contamination

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Surface water	Aquifer forms basal flow of surface water	unlikely	minor	VERY LOW

13.5 HAZARDOUS GAS

13.5.1 The desk study has not identified any credible on-site sources of ground gas and the site investigation has confirmed this. There are however several historical off-site landfills to the south and the underlying geology may present a permeable pathway for any lateral migration. However these landfills were filled with inert waste by the 1980s and there is not expected to be significant driving force for lateral gas migration. Nevertheless, a precautionary approach including ground gas monitoring is considered appropriate.

13.5.2 The response zones within two monitoring wells, (MWS101 and MWS103) were flooded due to localised shallow groundwater, however the response zone in monitoring well MWS106 (closest to the off-site landfills) was unsaturated and recorded very low gas readings (with a gas screening value commensurate with Characteristic Situation 1). In addition, the strata represented by the three boreholes are very similar and the testing of the Upper Tunbridge Wells Sand geology has confirmed a very low organic content such that the natural soils would not be expected to form a source of ground gas generation.

13.5.3 Hazardous gas monitoring is currently ongoing and therefore the risk assessment will be updated on completion of the monitoring programme.

13.5.4 Table 18 below provides a preliminary summary of the level of risk to each receptor from hazardous gas generation with a degree of uncertainty due to the incomplete ground gas monitoring programme. This will be updated in due course:

Table 18: Risks from hazardous gas

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	decomposition of putrescible material generating hazardous gas that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations.	unlikely	minor	VERY LOW
Residents of future development		unlikely	severe	MODERATE / LOW
Construction workers		unlikely	minor	VERY LOW
Adjacent site users		unlikely	minor	VERY LOW

13.5.5 In summary, It is anticipated that the site has a very low risk of ground gas ingress into new buildings due to low gases recorded in MWS106, the desk study not identifying a credible on-site source of ground gas and very low organic matter recorded in soil samples from the Upper Tunbridge Wells Sand. However due to the degree of uncertainty regarding the off-site landfills and the limited monitoring dataset, the risk level remains raised at this stage.

13.5.6 This assessment will be updated on completion of the monitoring programme and will be reported under a separate cover.

13.6 VAPOUR

13.6.1 Significant concentrations of Volatile Organic Compounds (VOCs) have not been encountered during monitoring.

13.6.2 Table 19 below summarises the level of risk to each receptor from vapour generation:

Table 19: Risks from vapour

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
The general public and present site users	Volatilisation of VOCs from contaminated soil	unlikely	minor	VERY LOW

Receptor	Pathway / Exposure	Likelihood of Risk	Severity of Risk	Overall Risk Rating
Residents of future development	generating vapours that can migrate by diffusion or advection via cracks in foundations / utility trenches / service penetrations. Outdoor inhalation in confined excavations / localised spills.	unlikely	minor	VERY LOW
Construction workers		unlikely	minor	VERY LOW
Adjacent site users / general public		unlikely	minor	VERY LOW

SECTION 14 UPDATED COMBINED CONCEPTUAL SITE MODEL AND RISK ASSESSMENT

- 14.1 Following completion of the Tier 2 generic quantitative risk assessment, the preliminary combined conceptual site model and risk assessment has been updated and is presented in Table 20.

Table 20: Combined Conceptual Site Model and Tier 2 Risk Assessment

POTENTIAL CONTAMINANT SOURCE	RELEASE MECHANISM	PATHWAY	EXPOSURE ROUTE	RECEPTOR								
				Present Site Users / General Public	Future Residents / Site Users	Construction Workers	On-Site Planting	Water Supply Pipes	Adjacent Site Users / General Public	Controlled Waters		Protected Habitat
										Surface Water	Aquifer	
SOIL (HEAVY METALS AND HYDROCARBONS)	DUST	AIR	INHALATION	VERY LOW	VERY LOW	VERY LOW			VERY LOW			VERY LOW
	DIRECT	DIRECT	INGESTION	VERY LOW	VERY LOW	VERY LOW						VERY LOW
	DIRECT	DIRECT	DERMAL EXPOSURE	VERY LOW	VERY LOW	VERY LOW						VERY LOW
	DIRECT	DIRECT	DIRECT CONTACT / UPTAKE				VERY LOW	VERY LOW				VERY LOW
	PLANT UPTAKE	GARDEN FRUIT AND VEGETABLES	INGESTION	VERY LOW	VERY LOW							
	INFILTRATION / LEACHING	GROUNDWATER FLOW	DIRECT								VERY LOW	VERY LOW
		▲▼										
	RUNOFF	SURFACE WATER FLOW	DIRECT							VERY LOW		VERY LOW
MADE GROUND (ASBESTOS)	FIBRE RELEASE	AIR	INHALATION	VERY LOW	VERY LOW	VERY LOW			VERY LOW			
SOIL (PUTRESCIBLE)	GAS FROM DECOMPOSITION	AIR	INHALATION	VERY LOW	MODERATE / LOW	VERY LOW			VERY LOW			
SOIL (VOC)	VAPOUR FROM VOLATILISATION /	AIR	INHALATION	VERY LOW	VERY LOW	VERY LOW			VERY LOW			
GROUNDWATER (VOC)	VAPOUR FROM VOLATILISATION	AIR	INHALATION	VERY LOW	VERY LOW	VERY LOW			VERY LOW			
GROUNDWATER (DISSOLVED CONTAMINANTS)	DIRECT	BASEFLOW TO SURFACE WATER	DIRECT							VERY LOW		VERY LOW
URANIUM IN UNDERLYING STRATA	RADON FROM RADIOACTIVE DECAY	AIR	INHALATION	VERY LOW	VERY LOW	VERY LOW						
X SOURCE►PATHWAY►RECEPTOR NOT COMPLETE AND NO FURTHER ACTION REQUIRED												

SECTION 15 DETAILED QUANTITATIVE RISK ASSESSMENT (TIER 3)

- 15.1 Other than completion of the ground gas monitoring programme, no contaminant linkages requiring further supplementary site investigation and detailed quantitative risk assessment have been identified.

SECTION 16 PRELIMINARY REMEDIATION STRATEGY AND RECOMMENDATIONS

- 16.1.1 No significant soil contamination has been identified and no remediation is required.
- 16.1.2 Further assessment of ground gas risk will be presented upon completion of the monitoring programme. This will determine the requirement or otherwise for structural ground gas protection measures in the new dwellings.
- 16.1.3 Given the presence of an adjacent surface water course which feeds into a downstream sensitive site, it will be necessary to employ silt management controls to prevent entry of suspended solids into the brook.
- 16.1.4 There is a significant volume of topsoil at the site. This topsoil is considered suitable for re-use from a contaminant perspective. The texture and nutrient status of this material should be confirmed with the project landscape architect should it be intended for re-use in garden and soft landscaped areas. If it is intended to re-use topsoil, then it is recommended that the resource status of this material is clearly defined to ensure compliance with waste legislation prior to its excavation. A Materials Management Plan under the CL:AIRE Code of Practice is a robust way of managing and documenting re-use of resource soils.
- 16.1.5 It is anticipated that sufficient volumes of site-derived soils will be available for use in gardens and landscaping. However, should any soil be imported for the formation of domestic gardens and landscaped areas it should be obtained from a validated source. The validation should incorporate an assessment of the provenance of the material and chemical analysis.
- 16.1.6 No specific risks to construction workers from chemical contaminants in soil have been identified. The adoption of standard Health and Safety procedures will ensure that risks to operatives at the site are minimised. Operatives should not be allowed to eat, drink or smoke on site except in designated areas and should be required to wash all exposed skin at the end of each shift. Operatives should be required to report any observations of suspect material as this may represent previously unexpected contamination.
- 16.1.7 It is recommended that the utility provider is consulted with respect to their requirements for water supply pipes. It is expected that utilities will be laid in uncontaminated natural soils.
- 16.1.8 Materials, including waste soils which are not to be retained on site, should be removed and disposed of in accordance with all relevant statutes.

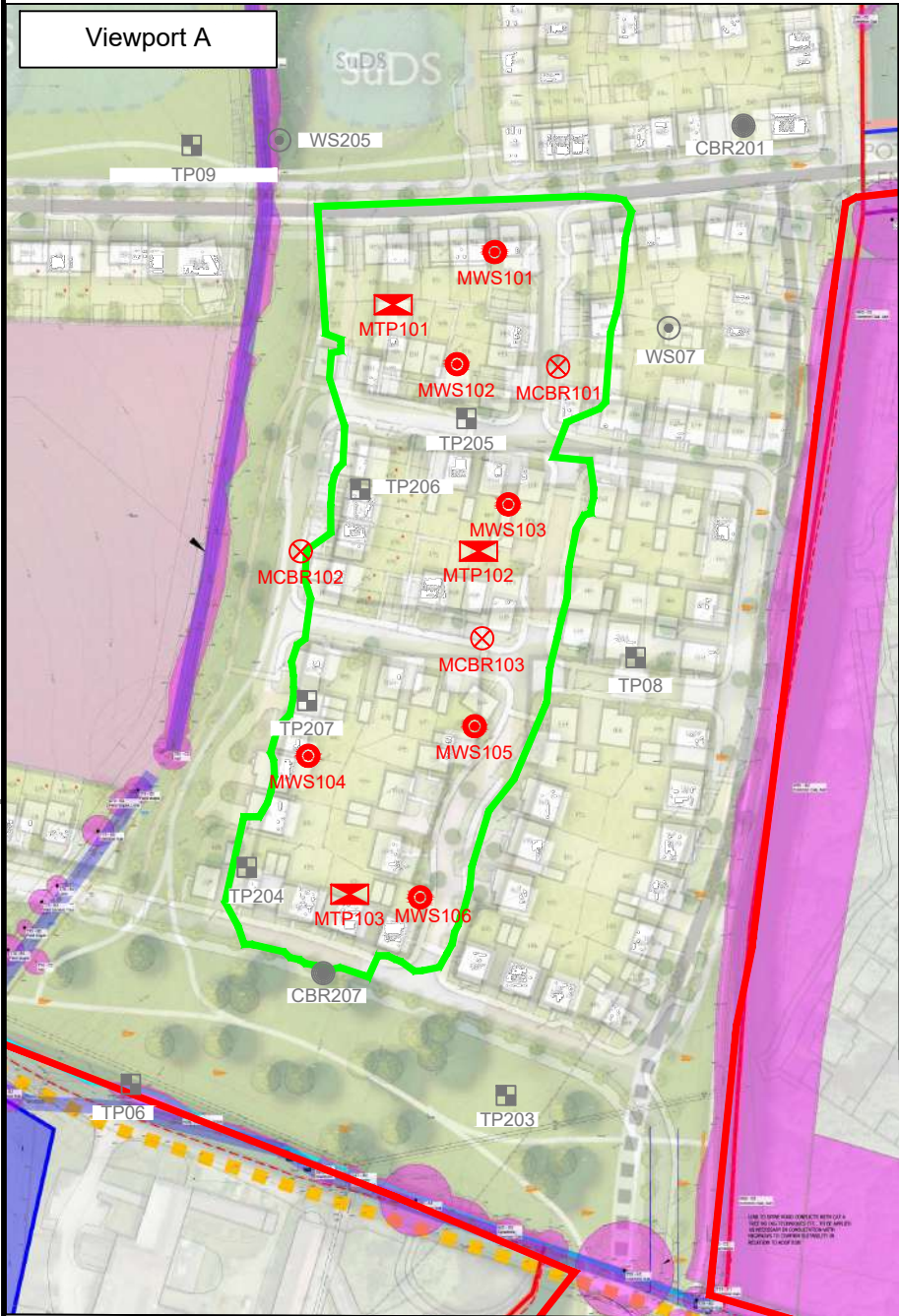
- 16.1.9 It is recommended that this report is submitted to the regulators (Local Authority EHO and Planners, Environment Agency Planning Liaison and NHBC) for approval prior to commencement of the works.
- 16.1.10 Any observations of ground conditions atypical of those already described should be reported to IDOM immediately so that an assessment of appropriate action can be made.

SECTION 17 CONCLUSIONS

- 17.1 The ground conditions were generally consistent with the published geology, with topsoil overlying Tunbridge Wells Sand Formation.
- 17.2 No significant contamination was identified during the investigation.
- 17.3 Based on the desk study, site investigation and preliminary ground gas monitoring rounds, hazardous ground gas was not found to be of concern, however the monitoring programme is ongoing and the gas risk assessment will be updated under a separate cover.
- 17.4 There is a significant volume of topsoil at the site. This topsoil is considered suitable for re-use from a contaminative perspective (further validation samples will be required).
- 17.5 An allowable bearing pressure has been provided for strip footings founded at a minimum depth of 0.9m within the Tunbridge Wells Sand Formation.
- 17.6 Footings must be founded within the Tunbridge Wells Sand Formation; greater bearing capacities are achievable if the footings are deepened to 2.0m bgl and footings which expose both cohesive and granular soils should be reinforced. The final depth of the footings must be determined using chapter 4.2 of the NHBC Standards.

APPENDIX 1

- Site Location Plan
- Proposed Development Plan



LEGEND					
	Site boundary				
	Parcel A				
	Parcel B				
	Merebrook trial pit with location reference				
	Merebrook window sample with location reference				
	Merebrook soakage test with location reference				
	California bearing ratio test with location reference				
	Previous trial pit location with reference				
	Previous window sample with location reference				
	Previous California bearing ration test with location reference				

FIRST ISSUE	01/25	CW	MB	MB	P01
DESCRIPTION	DATE	DWN	CHD	APP'D	REV

ISSUE PURPOSE	INFORMATION
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CLIENT	VISTRY
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PROJECT	21949ba
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DWG TITLE	IMBERHORNE LANE SITE INVESTIGATION PARCEL A
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DWG NO.	21949ba-304-002
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SCALE	N.T.S	DATE	15/01/2025	FRAME DIMS (mm)	(A3) 420 x 297
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DRAWN	CW	CHECKED	MB	APPROVED	MB
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Website: www.merebrook.co.uk t: +44(0)1773 829 988 e: info.derbyshire@idom.com

APPENDIX 2 ▪ Radon Potential Dataset Mapping

IMBERHORNE FARM COTTAGES, IMBERHORNE LANE, EAST GRINSTEAD, WEST SUSSEX, RH19 1TX

Professional opinion



Site plan



Search results

Not in a radon affected area

Local levels of radon are considered normal.

However, if an underground room makes up part of the accommodation, the property should be tested regardless of radon Affected Area status.

Useful contacts

UK Health Security Agency (UKHSA) / UKRadon
Radon Survey
Chemical, Radiation and Environmental Hazards
Chilton, Didcot
Oxon
OX11 0RQ
<https://www.ukradon.org/> ↗

UK Radon Association
<http://www.radonassociation.co.uk/> ↗

Overview of findings and recommendations

Radon

No further action is recommended based on the identified local levels of radon.

However, all basement and cellar areas are considered at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of radon Affected Area status.

It should be noted that although this report uses the best available data this assessment is an estimation and is not based upon measurements. It is possible to find high radon levels in properties anywhere in the country, even in lower risk areas, as radon is everywhere in varying concentrations.



Methodologies and limitations

Groundsure's methodologies and limitations are available here: knowledge.groundsure.com/methodologies-and-limitations ↗.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information in your Radon Check report. To find out who they are and their areas of expertise see www.groundsure.com/sources-reference ↗.

Conveyancing Information Executive and our terms & conditions

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- a small business (or group of companies) with an annual turnover of less than £3 million;
- a charity with an annual income of less than £3 million;
- a Trust with a net asset value of less than £3 million.

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If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Standards.

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- acknowledge it within 5 working days of receipt
- normally deal with it fully and provide a final response, in writing, within 20 working days of receipt
- liaise, at your request, with anyone acting formally on your behalf

Complaints should be sent to:

Operations Director, Groundsure Ltd, Nile House, Nile Street, Brighton, BN1 1HW. Tel: 01273 257 755. Email: info@groundsure.com

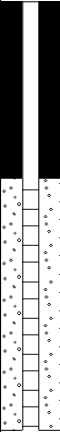
↗ If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk ↗ We will co-operate fully with the Ombudsman during an investigation and comply with their final decision.

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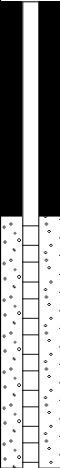
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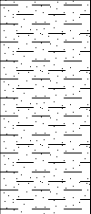
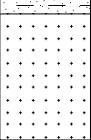
APPENDIX 3 ▪ Exploratory Hole Logs

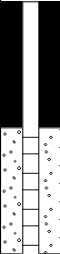
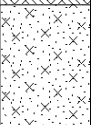
IDOM				Borehole Log					Borehole No. Parcel A MWS101			
Project Name: Imberholne Lane				Client: Vistry				Date: 09/12/2024				
Location: East Grinstead				Contractor:								
Project No: 21949ba				Weather:				Drilling Equipment: Premier Compact Series				
Logged By MB		Checked By		Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.20	ES					TOPSOIL comprising crop vegetation over very soft brown sandy CLAY. Sand is fine to coarse.				
		0.50	ES		0.40			Firm light yellow slightly sandy CLAY. Sand is fine. [UPPER TUNBRIDGE WELLS SAND]				
					0.70							
		1.00	SPT	N=23 (5,7/6,6,5,6)	1.40			Medium dense light yellow silty fine SAND. [UPPER TUNBRIDGE WELLS SAND]		1		
		1.70	D		1.70			Dense reddish brown silty fine SAND with occasional red and black oxidised sandstone. [UPPER TUNBRIDGE WELLS SAND]				
		1.70	SPT	50 (25 for 100mm/50 for 80mm)				End of Borehole at 1.70m		2		
										3		
										4		
										5		
										6		
Casing Details				Legend				Remarks				
Diameter	Top (m bgl)	Base (m bgl)	HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample							Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.		
Chiselling Details												
Top (m bgl)	Base (m bgl)	Duration (mins)								Groundwater Details		
										Depth Strike (m bgl)	Depth Rose (m bgl)	Time Elapsed (mins)

IDOM					Borehole Log					Borehole No. Parcel A MWS102		
Project Name: Imberholne Lane					Client: Vistry					Date: 09/12/2024		
Location: East Grinstead					Contractor:							
Project No: 21949ba					Weather:					Drilling Equipment: Premier Compact Series		
Logged By MB		Checked By			Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		1.00	D SPT	N=34 (1,1/5,7,11,11)	0.45			TOPSOIL comprising crop vegetation over very soft brown sandy CLAY. Sand is fine to coarse.				
		1.00								Light yellow sandy SILT with frequent siltstone nodules. Sand is fine. [UPPER TUNBRIDGE WELLS SAND]		
		1.50	D SPT	50 (25 for 75mm/50 for 100mm)	1.00			Dense light yellow silty fine SAND with occasional siltstone nodules. [UPPER TUNBRIDGE WELLS SAND]	1			
		1.65							Extremely weak light yellow fine grained SANDSTONE [UPPER TUNBRIDGE WELLS SAND]			
									End of Borehole at 1.70m			
									2			
										3		
										4		
										5		
										6		
Casing Details				Legend					Remarks			
Diameter	Top (m bgl)	Base (m bgl)		HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample					Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.			
Chiselling Details												
Top (m bgl)	Base (m bgl)	Duration (mins)						Groundwater Details				
								Depth Strike (m bgl)	Depth Rose (m bgl)	Time Elapsed (mins)		

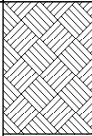
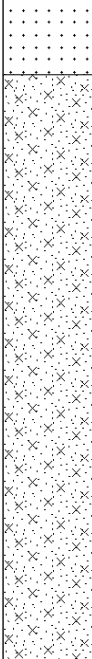
IDOM				Borehole Log					Borehole No. Parcel A MWS103		
Project Name: Imberholne Lane				Client: Vistry				Date: 09/12/2024			
Location: East Grinstead				Contractor:							
Project No: 21949ba				Weather:				Drilling Equipment: Premier Compact Series			
Logged By MB		Checked By		Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.20	ES			0.45		TOPSOIL comprising crop vegetation over very soft brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravels are subangular to subrounded fine brick and flint.			
								Light yellow mottled orange silty fine SAND with occasional sandstone nodules. [UPPER TUNBRIDGE WELLS SAND]			
		1.00	SPT	N=20 (5,5/5,4,5,6)	1.00		Medium dense light yellow mottled orange silty fine SAND with occasional sandstone nodules. [UPPER TUNBRIDGE WELLS SAND]		1		
								Very weak reddish brown fine grained SANDSTONE. [UPPER TUNBRIDGE WELLS SAND]			
		1.85 1.85	D SPT	50 (25 for 75mm/50 for 90mm)	1.85			End of Borehole at 1.85m		2	
										3	
										4	
										5	
										6	
Casing Details				Legend				Remarks			
Diameter	Top (m bgl)	Base (m bgl)	HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample							Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.	
Chiselling Details											
Top (m bgl)	Base (m bgl)	Duration (mins)									
				Groundwater Details							
				Depth Strike (m bgl)	Depth Rose (m bgl)	Time Elapsed (mins)					

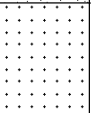
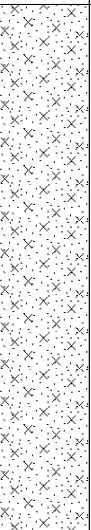
IDOM				Borehole Log				Borehole No. Parcel A MWS104			
Project Name: Imberholne Lane				Client: Vistry			Date: 09/12/2024				
Location: East Grinstead				Contractor:							
Project No: 21949ba				Weather:			Drilling Equipment: Premier Compact Series				
Logged By MB		Checked By		Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		1.00 1.00	D SPT	N=29 (8,10/9,7,7,6)	0.50 1.10			TOPSOIL comprising crop vegetation over very soft brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravels are subangular to subrounded fine brick and flint.		1	
								Light yellow silty fine SAND with frequent siltstone nodules. [UPPER TUNBRIDGE WELLS]			
								Medium dense silty fine SAND with frequent claystone nodules. [UPPER TUNBRIDGE WELLS SAND]			
		2.00 2.00	D SPT	50 (5,7/50 for 155mm)	2.00			End of Borehole at 2.00m		2	
										3	
										4	
										5	
										6	
Casing Details				Legend				Remarks			
Diameter	Top (m bgl)	Base (m bgl)		HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample				Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.			
Chiselling Details											
Top (m bgl)	Base (m bgl)	Duration (mins)									
								Groundwater Details			
				Depth Strike (m bgl)				Depth Rose (m bgl)		Time Elapsed (mins)	

IDOM				Borehole Log					Borehole No. Parcel A MWS105		
Project Name: Imberholne Lane				Client: Vistry				Date: 09/12/2024			
Location: East Grinstead				Contractor:							
Project No: 21949ba				Weather:				Drilling Equipment: Premier Compact Series			
Logged By MB		Checked By		Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.20	ES	N=1 (0,0/0,0,0,1)	0.60			TOPSOIL comprising crop vegetation over very soft brown sandy CLAY. Sand is fine to coarse.		1	
		0.80	D						Very soft brown sandy CLAY. Sand is fine. [UPPER TUNBRIDGE WELLS SAND]		
		1.00	SPT								
		1.70	D		Extremely weak light yellow fine grained SANDSTONE. [UPPER TUNBRIDGE WELLS SAND]						
		2.00	SPT		End of Borehole at 2.00m		2				
				50 (25 for 70mm/50 for 45mm)	2.00					3	
										4	
										5	
										6	
Casing Details				Legend				Remarks			
Diameter	Top (m bgl)	Base (m bgl)		HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample				Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.			
Chiselling Details											
Top (m bgl)	Base (m bgl)	Duration (mins)									
				Groundwater Details							
Depth Strike (m bgl)		Depth Rose (m bgl)		Time Elapsed (mins)							

IDOM				Borehole Log					Borehole No. Parcel A MWS106		
Project Name: Imberholne Lane				Client: Vistry				Date: 09/12/2024			
Location: East Grinstead				Contractor:							
Project No: 21949ba				Weather:				Drilling Equipment: Premier Compact Series			
Logged By MB		Checked By		Level		Hole Type WLS		Scale 1:30		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
			D SPT		0.50		TOPSOIL comprising crop vegetation over very soft brown slightly sandy CLAY. Sand is fine to coarse.				
							Light yellow silty fine SAND with rare siltstone nodules. [UPPER TUNBRIDGE WELLS]				
		1.00 1.00				N=50 (2,4/6,8,14,22)	1.00			End of Borehole at 1.00m	
									2		
									3		
									4		
									5		
									6		
Casing Details				Legend				Remarks			
Diameter	Top (m bgl)	Base (m bgl)	HVP = Hand Vane Peak (kPa) PP = Pocket Penetrometer (kg cm2) PID = Photoionisation detector (ppm) D = Small Disturbed Sample (tub) J = Organic Sample (amber glass jar) V = Volatile Sample (amber glass vial) B = Bulk Bag Sample SPT(C) = Standard Penetration Test (cone) SPT(S) = Standard Penetration Test (split spoon) U = Undisturbed Sample							Coordinates and levels, where indicated, must not be used for design purposes. The user is responsible for verifying all site and setting out dimensions.	
Chiselling Details											
Top (m bgl)	Base (m bgl)	Duration (mins)									
			Groundwater Details								
			Depth Strike (m bgl)	Depth Rose (m bgl)	Time Elapsed (mins)						

IDOM		Trial Pit Log										
Project Name: Imberholne Lane				Client: Vistry				Date: 16/12/2024				
Location: East Grinstead				Contractor: IDOM								
Project No. : 21949ba				Crew Name: BPH				Equipment: 360 Excavator				
Location Number Parcel A MTP101		Location Type TP		Level		Logged By MB		Scale 1:20		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.20	B		0.40			TOPSOIL comprising crop vegetation over very soft brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravels are subangular to subrounded fine brick and flint.		0.5		
		0.50	B					Yellowish brown mottled orange silty fine SAND with occasional lenses of sandstone. [UPPER TUNBRIDGE WELLS SAND]				
								Extremely weak light yellow fine grained SANDSTONE [UPPER TUNBRIDGE WELLS SAND]			1.0	
		1.70	B		1.80				End of Borehole at 1.80m		2.0	
										2.5		
										3.0		
										3.5		
										4.0		
Dimensions				Trench Support and Comment				Pumping Data				
Pit Length 2.40		Pit Width 0.55		Pit Stability Stable		Shoring Used		Remarks		Date	Rate	Remarks
Remarks												
IDOM												

IDOM		Trial Pit Log										
Project Name: Imberholne Lane				Client: Vistry				Date: 16/12/2024				
Location: East Grinstead				Contractor: IDOM								
Project No. : 21949ba				Crew Name: BPH				Equipment: 360 Excavator				
Location Number Parcel A MTP102		Location Type TP		Level		Logged By MB		Scale 1:20		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.40	B		0.35			TOPSOIL comprising crop vegetation over very soft brown sandy CLAY. Sand is fine to coarse.		0.5		
								Extremely weak light yellow fine grained SANDSTONE [UPPER TUNBRIDGE WELLS SAND]				
		1.00	B		0.55			Yellowish brown silty fine SAND with occasional lenses of sandstone. [UPPER TUNBRIDGE WELLS SAND]				
				2.10 2.20			Extremely weak light yellow fine grained SANDSTONE [UPPER TUNBRIDGE WELLS SAND]		2.5			
							End of Borehole at 2.20m					
										3.0		
										3.5		
										4.0		
Dimensions				Trench Support and Comment				Pumping Data				
Pit Length 2.85		Pit Width 0.55		Pit Stability Stable		Shoring Used		Remarks		Date	Rate	Remarks
Remarks												
IDOM												

IDOM		Trial Pit Log													
Project Name: Imberholne Lane				Client: Vistry				Date: 16/12/2024							
Location: East Grinstead				Contractor: IDOM											
Project No. : 21949ba				Crew Name: BPH				Equipment: 360 Excavator							
Location Number Parcel A MTP103		Location Type TP		Level		Logged By MB		Scale 1:20		Page Number Sheet 1 of 1					
Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description								
	Depth (m)	Type	Results												
	0.30	B		0.20			TOPSOIL comprising crop vegetation over very soft brown sandy CLAY. Sand is fine to coarse.		0.5						
				0.40			Soft orangish brown sandy CLAY. Sand is fine. [UPPER TUNBRIDGE WELLS SAND]								
							Extremely weak light yellow fine grained SANDSTONE [UPPER TUNBRIDGE WELLS SAND]								
							0.70					Yellowish brown mottled orange silty fine SAND with occasional nodules of sandstone. [UPPER TUNBRIDGE WELLS SAND]		1.0	
2.00	B		2.10	End of Borehole at 2.10m		1.5									
						2.0									
						2.5									
								3.0							
								3.5							
								4.0							
Dimensions			Trench Support and Comment						Pumping Data						
Pit Length 2.70		Pit Width 0.55		Pit Stability Stable		Shoring Used		Remarks		Date		Rate		Remarks	
Remarks													IDOM		

APPENDIX 4

- Soil Chemistry
- Summary Spreadsheet
- Laboratory Analysis Certificates

Merebrook
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Derbyshire
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Analytical Report Number : 24-059768

Project / Site name:	Parcel A Imberhorne Lane	Samples received on:	10/12/2024
Your job number:	21949BA	Samples instructed on/ Analysis started on:	16/12/2024
Your order number:	24 2 FDO LABS	Analysis completed by:	23/12/2024
Report Issue Number:	1	Report issued on:	23/12/2024
Samples Analysed:	6 soil samples		

Signed: 

Rachel Chappell
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting
air - once the analysis is complete

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

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

Analytical Report Number: 24-059768
Project / Site name: Parcel A Imberhorne Lane
Your Order No: 24 2 FDO LABS

Lab Sample Number				409757	409758	409759	409760	409761
Sample Reference				Parcel A - MWS101 ES	Parcel A - MWS101 ES	Parcel A - MWS103 ES	Parcel A - MWS105 ES	Parcel A - MWS106 ES
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.20	0.50	0.20	0.20	0.20
Date Sampled				09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	18	21	15	22
Total mass of sample received	kg	0.1	NONE	0.8	0.8	0.5	0.8	0.8

Asbestos

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

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.8	7.1	7.6	7.3	6.5
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	19	25	22	30
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0168	0.0095	0.0124	0.0111	0.015
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.8	9.5	12.4	11.1	15
Organic Matter (automated)	%	0.1	MCERTS	2.6	0.3	2.3	1.4	2.9
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.5	0.2	1.3	0.8	1.7

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05	< 0.05	0.06
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
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Analytical Report Number: 24-059768
Project / Site name: Parcel A Imberhorne Lane
Your Order No: 24 2 FDO LABS

Lab Sample Number				409757	409758	409759	409760	409761
Sample Reference				Parcel A - MWS101 ES	Parcel A - MWS101 ES	Parcel A - MWS103 ES	Parcel A - MWS105 ES	Parcel A - MWS106 ES
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.20	0.50	0.20	0.20	0.20
Date Sampled				09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7	6.2	7.3	8.7	6.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	40	31	41	44	26
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	16	20	20	22	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	20	20	22	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	9.3	15	12	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	11	30	21	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	14	11	13	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	24	27	30	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	35	44	48	39

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_ID_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_ID_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC35 - EC40 _{EH_CU_ID_AL}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aliphatic >EC5 - EC40 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_ID_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_ID_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_ID_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC35 - EC40 _{EH_CU_ID_AR}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC5 - EC40 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH Total >EC5 - EC40 _{EH_CU+HS_ID_TOTAL}	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
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VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 24-059768
Project / Site name: Parcel A Imberhorne Lane
Your Order No: 24 2 FDO LABS

Lab Sample Number				409757	409758	409759	409760	409761
Sample Reference				Parcel A - MWS101 ES	Parcel A - MWS101 ES	Parcel A - MWS103 ES	Parcel A - MWS105 ES	Parcel A - MWS106 ES
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.20	0.50	0.20	0.20	0.20
Date Sampled				09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Pesticides

Alpha-BHC (Benzene Hexachloride)	µg/kg	10	NONE	-	-	-	< 10	-
Alachlor	µg/kg	10	NONE	-	-	-	< 10	-
Gamma-BHC (Lindane, gamma HCH)	µg/kg	10	NONE	-	-	-	< 10	-
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-	-	-	< 10	-
1,3,5-Trichlorobenzene	µg/kg	10	NONE	-	-	-	< 10	-
2,6-Dichlorobenzonitrile	µg/kg	10	NONE	-	-	-	< 10	-
Hexachlorobutadiene	µg/kg	10	NONE	-	-	-	< 10	-
1,2,4,5-Tetrachlorobenzene	µg/kg	10	NONE	-	-	-	< 10	-
Endosulfan sulfate	µg/kg	10	NONE	-	-	-	< 10	-
Hexachlorobenzene	µg/kg	10	NONE	-	-	-	< 10	-
Pentachlorobenzene	µg/kg	10	NONE	-	-	-	< 10	-
Technazene	µg/kg	10	NONE	-	-	-	< 10	-
Aldrin	µg/kg	10	NONE	-	-	-	< 10	-
Beta-BHC	µg/kg	10	NONE	-	-	-	< 10	-
Cis-Chlordane	µg/kg	10	NONE	-	-	-	< 10	-
Chlorothalonil	µg/kg	10	NONE	-	-	-	< 10	-
Delta-BHC	µg/kg	10	NONE	-	-	-	< 10	-
Dieldrin	µg/kg	10	NONE	-	-	-	< 10	-
Heptachlor Exo-epoxide	µg/kg	10	NONE	-	-	-	< 10	-
Endrin	µg/kg	10	NONE	-	-	-	< 10	-
Endosulfan I (alpha isomer)	µg/kg	10	NONE	-	-	-	< 10	-
Endosulfan II (beta isomer)	µg/kg	10	NONE	-	-	-	< 10	-
Isodrin	µg/kg	10	NONE	-	-	-	< 10	-
O,p'-DDD	µg/kg	10	NONE	-	-	-	< 10	-
O,p'-DDE	µg/kg	10	NONE	-	-	-	< 10	-
O,p'-DDT	µg/kg	10	NONE	-	-	-	< 10	-
P,p'-DDD	µg/kg	10	NONE	-	-	-	< 10	-
P,p'-DDE	µg/kg	10	NONE	-	-	-	< 10	-
P,p'-DDT	µg/kg	10	NONE	-	-	-	< 10	-
P,p'-Methoxychlor	µg/kg	10	NONE	-	-	-	< 10	-
Trans-Chlordane	µg/kg	10	NONE	-	-	-	< 10	-
Trifluralin	µg/kg	10	NONE	-	-	-	< 10	-

Analytical Report Number: 24-059768
 Project / Site name: Parcel A Imberhorne Lane
 Your Order No: 24 2 FDO LABS

Lab Sample Number				409757	409758	409759	409760	409761
Sample Reference				Parcel A - MWS101 ES	Parcel A - MWS101 ES	Parcel A - MWS103 ES	Parcel A - MWS105 ES	Parcel A - MWS106 ES
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.20	0.50	0.20	0.20	0.20
Date Sampled				09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Acid Herbicides

4-CPA	µg/kg	10	NONE	-	-	-	< 10	-
Dinoseb	µg/kg	10	NONE	-	-	-	< 10	-
Flamprop	µg/kg	10	NONE	-	-	-	< 10	-
Ioxynil	µg/kg	10	NONE	-	-	-	< 10	-
2,3,6-TBA	µg/kg	10	NONE	-	-	-	< 10	-
Bromacil	µg/kg	10	NONE	-	-	-	< 10	-
Diclofop	µg/kg	10	NONE	-	-	-	< 10	-
Flamprop-Isopropyl	µg/kg	10	NONE	-	-	-	< 10	-
MCPP (Mecoprop)	µg/kg	10	NONE	-	-	-	< 10	-
Bromoxynil	µg/kg	10	NONE	-	-	-	< 10	-
Dichlorprop	µg/kg	10	NONE	-	-	-	< 10	-
Clopyralid	µg/kg	10	NONE	-	-	-	< 10	-
2,4-D	µg/kg	10	NONE	-	-	-	< 10	-
2,4-DB	µg/kg	10	NONE	-	-	-	< 10	-
Dicamba	µg/kg	10	NONE	-	-	-	< 10	-
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	-	-	-	< 10	-
MCPB	µg/kg	10	NONE	-	-	-	< 10	-
Picloram	µg/kg	10	NONE	-	-	-	< 10	-
2,4,5-T	µg/kg	10	NONE	-	-	-	< 10	-
MCPA	µg/kg	10	NONE	-	-	-	< 10	-

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

Analytical Report Number: 24-059768
Project / Site name: Parcel A Imberhorne Lane
Your Order No: 24 2 FDO LABS

Lab Sample Number				409762
Sample Reference				Parcel A - MWS106 ES
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.50
Date Sampled				09/12/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.1	NONE	0.8

Asbestos

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

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	46
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0232
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	23.2
Organic Matter (automated)	%	0.1	MCERTS	< 0.1
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	< 0.1

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80
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Analytical Report Number: 24-059768
 Project / Site name: Parcel A Imberhorne Lane
 Your Order No: 24 2 FDO LABS

Lab Sample Number				409762
Sample Reference				Parcel A - MWS106 ES
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.50
Date Sampled				09/12/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1
Barium (aqua regia extractable)	mg/kg	1	MCERTS	41
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.6
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0
TPHCWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	< 10
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10
TPHCWG - Aliphatic >EC5 - EC40 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10
TPHCWG - Aromatic >EC5 - EC40 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10

TPH Total >EC5 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	< 10
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VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0

Analytical Report Number: 24-059768
 Project / Site name: Parcel A Imberhorne Lane
 Your Order No: 24 2 FDO LABS

Lab Sample Number				409762
Sample Reference				Parcel A - MWS106 ES
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.50
Date Sampled				09/12/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Pesticides

Alpha-BHC (Benzene Hexachloride)	µg/kg	10	NONE	-
Alachlor	µg/kg	10	NONE	-
Gamma-BHC (Lindane, gamma HCH)	µg/kg	10	NONE	-
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-
1,3,5-Trichlorobenzene	µg/kg	10	NONE	-
2,6-Dichlorobenzonitrile	µg/kg	10	NONE	-
Hexachlorobutadiene	µg/kg	10	NONE	-
1,2,4,5-Tetrachlorobenzene	µg/kg	10	NONE	-
Endosulfan sulfate	µg/kg	10	NONE	-
Hexachlorobenzene	µg/kg	10	NONE	-
Pentachlorobenzene	µg/kg	10	NONE	-
Tecnazene	µg/kg	10	NONE	-
Aldrin	µg/kg	10	NONE	-
Beta-BHC	µg/kg	10	NONE	-
Cis-Chlordane	µg/kg	10	NONE	-
Chlorothalonil	µg/kg	10	NONE	-
Delta-BHC	µg/kg	10	NONE	-
Dieldrin	µg/kg	10	NONE	-
Heptachlor Exo-epoxide	µg/kg	10	NONE	-
Endrin	µg/kg	10	NONE	-
Endosulfan I (alpha isomer)	µg/kg	10	NONE	-
Endosulfan II (beta isomer)	µg/kg	10	NONE	-
Isodrin	µg/kg	10	NONE	-
O,p'-DDD	µg/kg	10	NONE	-
O,p'-DDE	µg/kg	10	NONE	-
O,p'-DDT	µg/kg	10	NONE	-
P,p'-DDD	µg/kg	10	NONE	-
P,p'-DDE	µg/kg	10	NONE	-
P,p'-DDT	µg/kg	10	NONE	-
P,p'-Methoxychlor	µg/kg	10	NONE	-
Trans-Chlordane	µg/kg	10	NONE	-
Trifluralin	µg/kg	10	NONE	-

Analytical Report Number: 24-059768
 Project / Site name: Parcel A Imberhorne Lane
 Your Order No: 24 2 FDO LABS

Lab Sample Number				409762
Sample Reference				Parcel A - MWS106 ES
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.50
Date Sampled				09/12/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Acid Herbicides

4-CPA	µg/kg	10	NONE	-
Dinoseb	µg/kg	10	NONE	-
Flamprop	µg/kg	10	NONE	-
Ioxynil	µg/kg	10	NONE	-
2,3,6-TBA	µg/kg	10	NONE	-
Bromacil	µg/kg	10	NONE	-
Diclofop	µg/kg	10	NONE	-
Flamprop-Isopropyl	µg/kg	10	NONE	-
MCPP (Mecoprop)	µg/kg	10	NONE	-
Bromoxynil	µg/kg	10	NONE	-
Dichlorprop	µg/kg	10	NONE	-
Clopyralid	µg/kg	10	NONE	-
2,4-D	µg/kg	10	NONE	-
2,4-DB	µg/kg	10	NONE	-
Dicamba	µg/kg	10	NONE	-
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	-
MCPB	µg/kg	10	NONE	-
Picloram	µg/kg	10	NONE	-
2,4,5-T	µg/kg	10	NONE	-
MCPA	µg/kg	10	NONE	-

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

Analytical Report Number : 24-059768

Project / Site name: Parcel A Imberhorne Lane

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
409757	cel A - MWS101	None Supplied	0.2	Brown clay with gravel and stones
409758	cel A - MWS101	None Supplied	0.5	Brown clay and sand
409759	cel A - MWS103	None Supplied	0.2	Brown clay and sand
409760	cel A - MWS105	None Supplied	0.2	Brown clay and sand
409761	cel A - MWS106	None Supplied	0.2	Brown clay and sand
409762	cel A - MWS106	None Supplied	0.5	Brown clay and sand

Analytical Report Number : 24-059768

Project / Site name: Parcel A Imberhorne Lane

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Pesticides by GC-MS/MS	Determination of Pesticides in soil by GC MS/MS	In-house method	L055B	W	NONE
Acid Herbicides by LC-MS	Determination of Acid Herbicides in soil by LC -MS	In-house method	PL	W	NONE
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS

Analytical Report Number : 24-059768

Project / Site name: Parcel A Imberhorne Lane

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

APPENDIX 5 ▪ Geotechnical Laboratory Certificates



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ

Contact: Tim Stempt
Site Address: Ingrebourne-Parcel A

Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

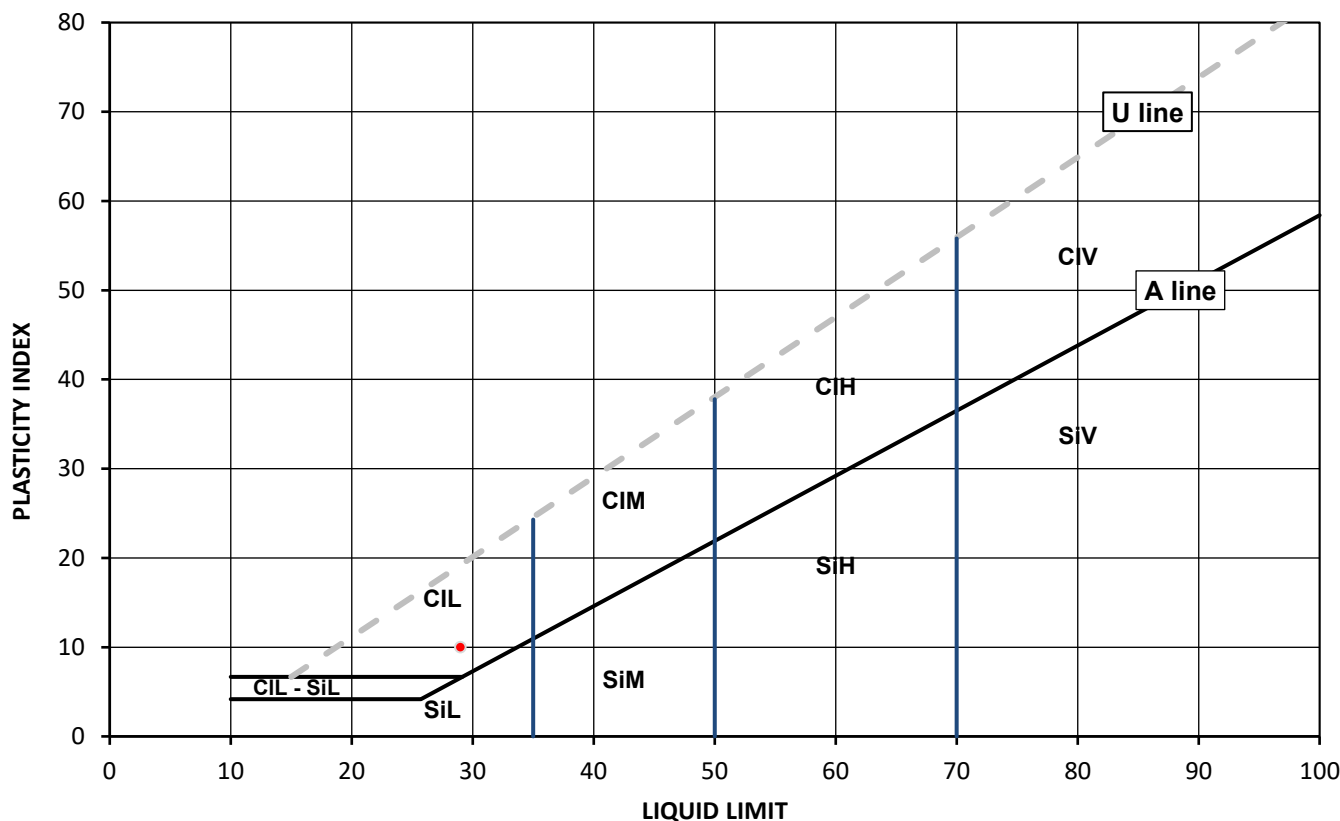
Test Results:

Laboratory Reference: 420088
Hole No.: Parcel A MTP102
Sample Reference: Not Given
Sample Description: Yellowish brown slightly gravelly very sandy CLAY

Depth Top [m]: 1.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >0.425mm; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
17.5	29	19	10	-0.10	1.10	94



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

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

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ

Contact: Tim Stempt
Site Address: Ingrebourne-Parcel A

Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

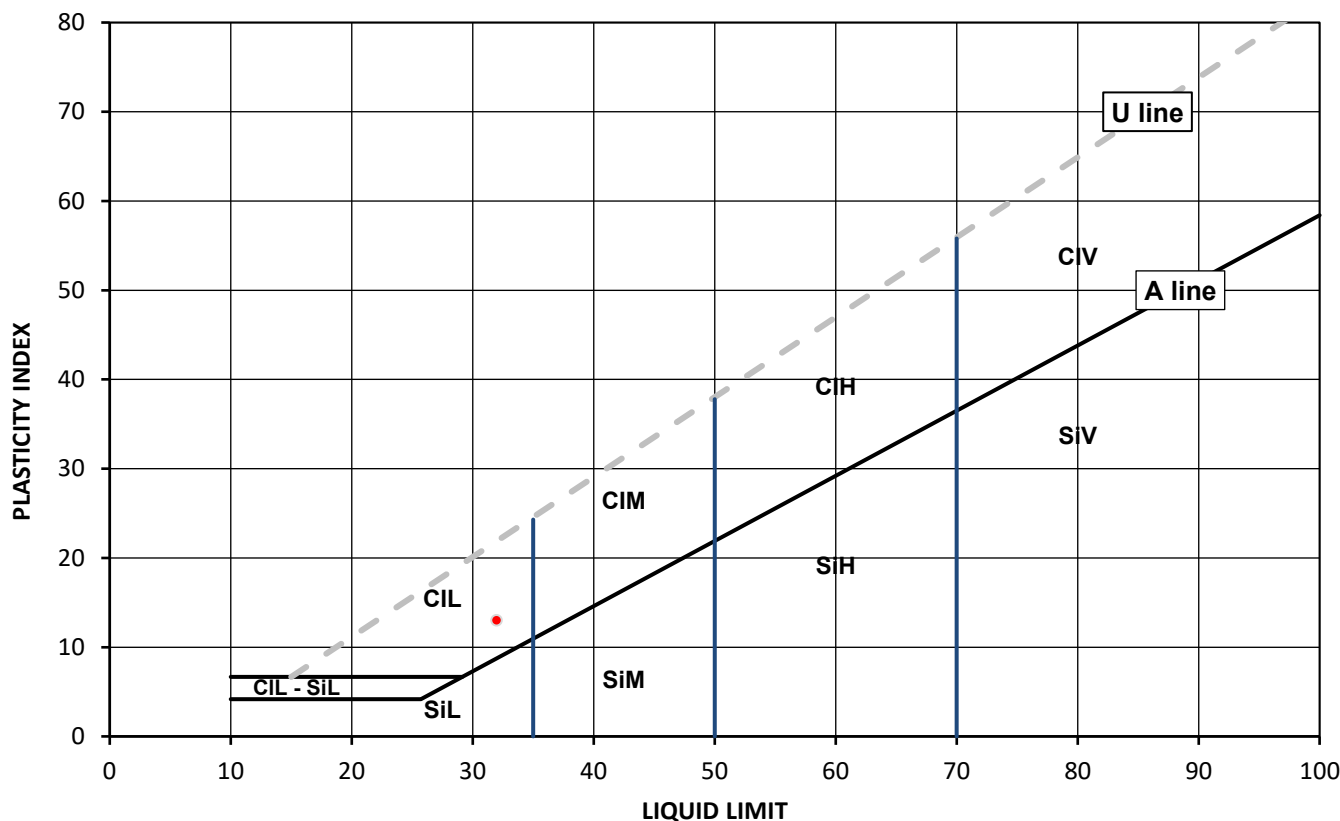
Test Results:

Laboratory Reference: 420090
Hole No.: Parcel A MTP103
Sample Reference: Not Given
Sample Description: Yellowish brown slightly gravelly very sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >0.425mm; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
17.3	32	19	13	-0.15	1.15	83



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

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

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne-Parcel A

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt
Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit								Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD	
			m	m															Mg/m3
420088	Parcel A MTP102	Not Given	1.00	Not Given	B	Yellowish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	17.5	94	29	-	19	10	80g/30 deg	WR / I				
420090	Parcel A MTP103	Not Given	2.00	Not Given	B	Yellowish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	17.3	83	32	-	19	13	80g/30 deg	WR / I				

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



SUMMARY REPORT
DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

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



Environmental Science

4041
Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne-Parcel A

Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type														
420088	Parcel A MTP102	Not Given	1.00	Not Given	B	Yellowish brown slightly gravelly very sandy CLAY		17.5											
420090	Parcel A MTP103	Not Given	2.00	Not Given	B	Yellowish brown slightly gravelly very sandy CLAY		17.3											

Comments:

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Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



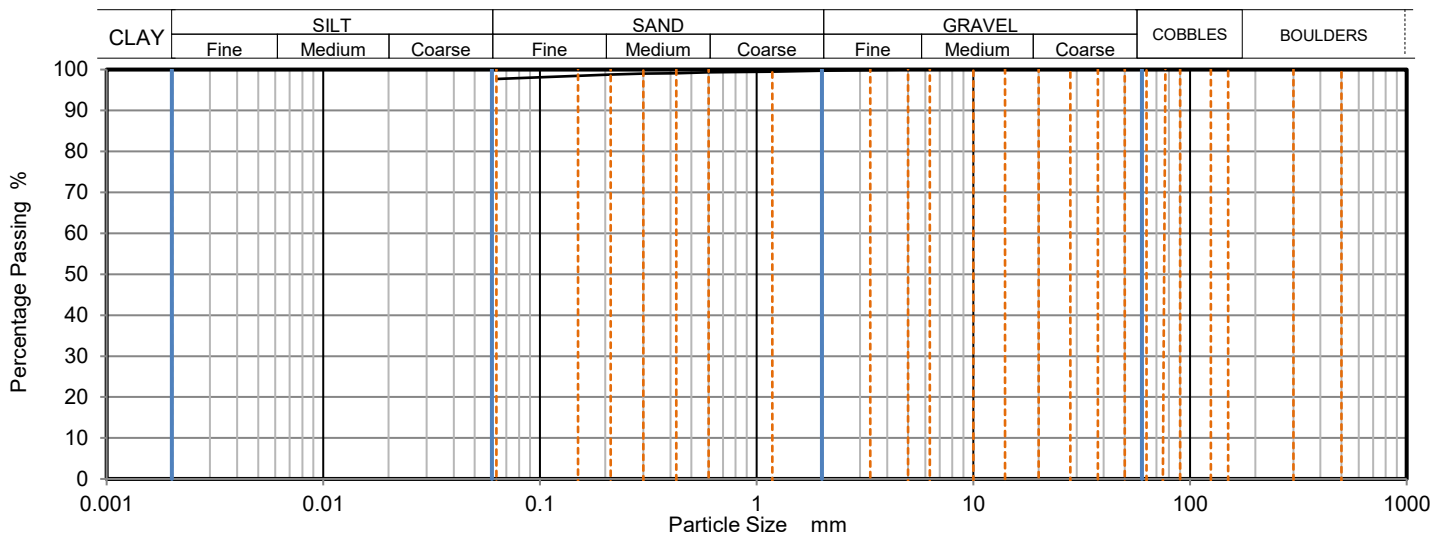
4041

**TEST CERTIFICATE****DETERMINATION OF PARTICLE
SIZE DISTRIBUTION**Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne-Parcel AClient Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test Results:Laboratory Reference: 420085
Hole No.: Parcel A MTP101
Sample Reference: Not Given
Sample Description: Light brown slightly sandy SILT
Sample Preparation: Sample was quartered, oven dried at 107.8 °C and broken down by hand.Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: B

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	99		
0.212	99		
0.15	99		
0.063	98		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	2
Fines <0.063 mm	98

Grading Analysis		
D100	mm	6.3
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance
with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041

**TEST CERTIFICATE****DETERMINATION OF PARTICLE
SIZE DISTRIBUTION**Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne-Parcel A

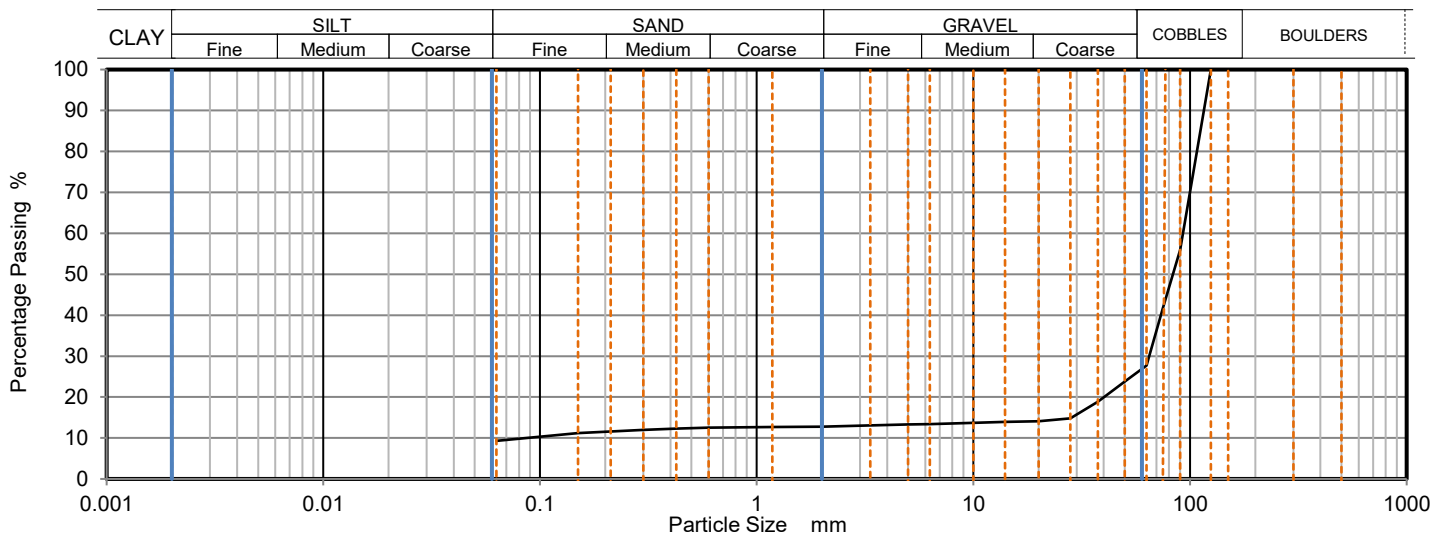
Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test Results:

Laboratory Reference: 420087
Hole No.: Parcel A MTP102
Sample Reference: Not Given
Sample Description: Yellowish brown slightly sandy clayey SILTSTONE
Sample Preparation: Sample was quartered, oven dried at 107.8 °C and broken down by hand.

Depth Top [m]: 0.40
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	56		
75	42		
63	28		
50	24		
37.5	19		
28	15		
20	14		
14	14		
10	14		
6.3	13		
5	13		
3.35	13		
2	13		
1.18	13		
0.6	13		
0.425	12		
0.3	12		
0.212	12		
0.15	11		
0.063	9		

Sample Proportions	% dry mass
Very coarse	72
Gravel	15
Sand	4
Fines <0.063 mm	9

Grading Analysis	
D100	mm 125
D60	mm 92.8
D30	mm 64.8
D10	mm 0.0867
Uniformity Coefficient	1100
Curvature Coefficient	520

Uniformity and Curvature Coefficient calculated in accordance
with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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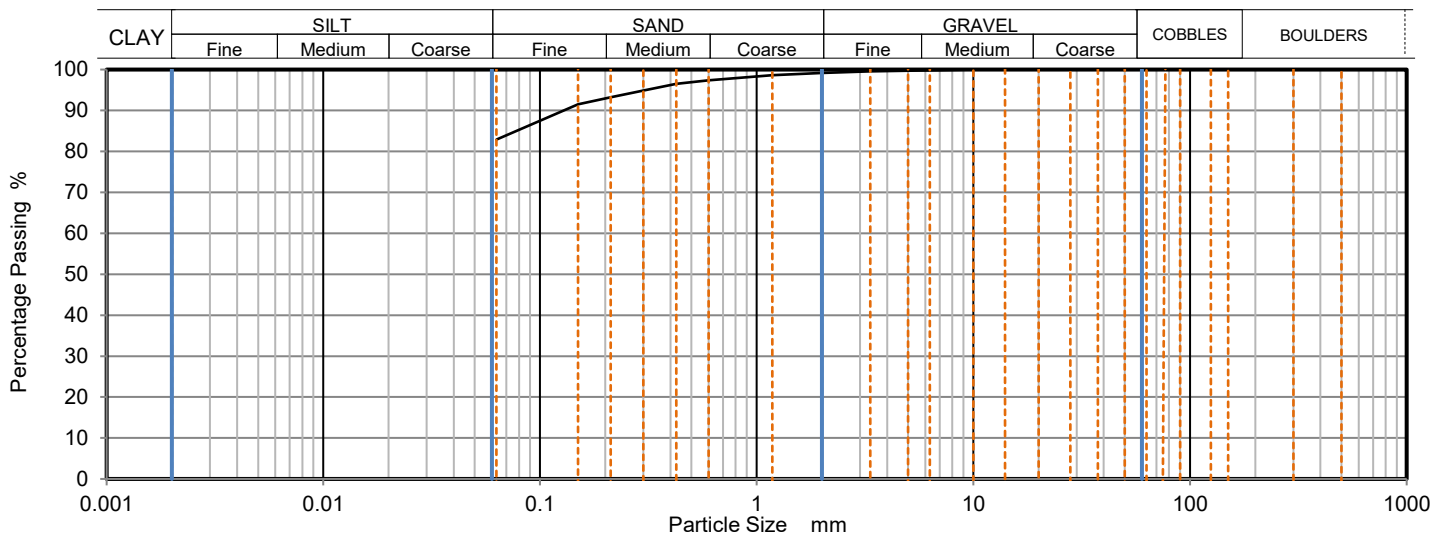
4041

**TEST CERTIFICATE****DETERMINATION OF PARTICLE
SIZE DISTRIBUTION**Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne-Parcel AClient Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test Results:Laboratory Reference: 420089
Hole No.: Parcel A MTP103
Sample Reference: Not Given
Sample Description: Yellowish brown slightly sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 107.8 °C and broken down by hand.Depth Top [m]: 0.30
Depth Base [m]: Not Given
Sample Type: B

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	97		
0.425	97		
0.3	95		
0.212	93		
0.15	92		
0.063	83		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	16
Fines <0.063 mm	83

Grading Analysis		
D100	mm	10
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance
with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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DETERMINATION OF POINT LOAD STRENGTH

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



Environmental Science

Client:	Merebrook
Client Address:	First Floor, 1 Leonard Place, Westerham Road, Keston, BR2 6HQ
Contact:	Tim Stempt
Site Address:	Ingrebourne-Parcel A

Client Reference: 21949BA
Job Number: 25-000578-1
Date Sampled: 16/12/2024
Date Received: 09/01/2025
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

[illegible]

Note: #: non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random; Dimensions: Dps - Distance between platens (platen separation), Dps* - at failure (see ISRM note 6), Lne - Length from platens to nearest free end and W - Width of shortest dimension perpendicular to load, P; Detailed legend for test and dimensions, based on ISRM, is shown above. Size factor, F = (De/50)0.45 for all tests

Equipment No.: i2 4341 Calibration Date: 15/03/2024 - 15/03/2025

Comments:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ

Contact: Tim Stempt
Site Address: Ingrebourne Remaining Areas

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

Client Reference: 21949BA
Job Number: 25-000726-1
Date Sampled: 16/12/2024
Date Received: 17/12/2024
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

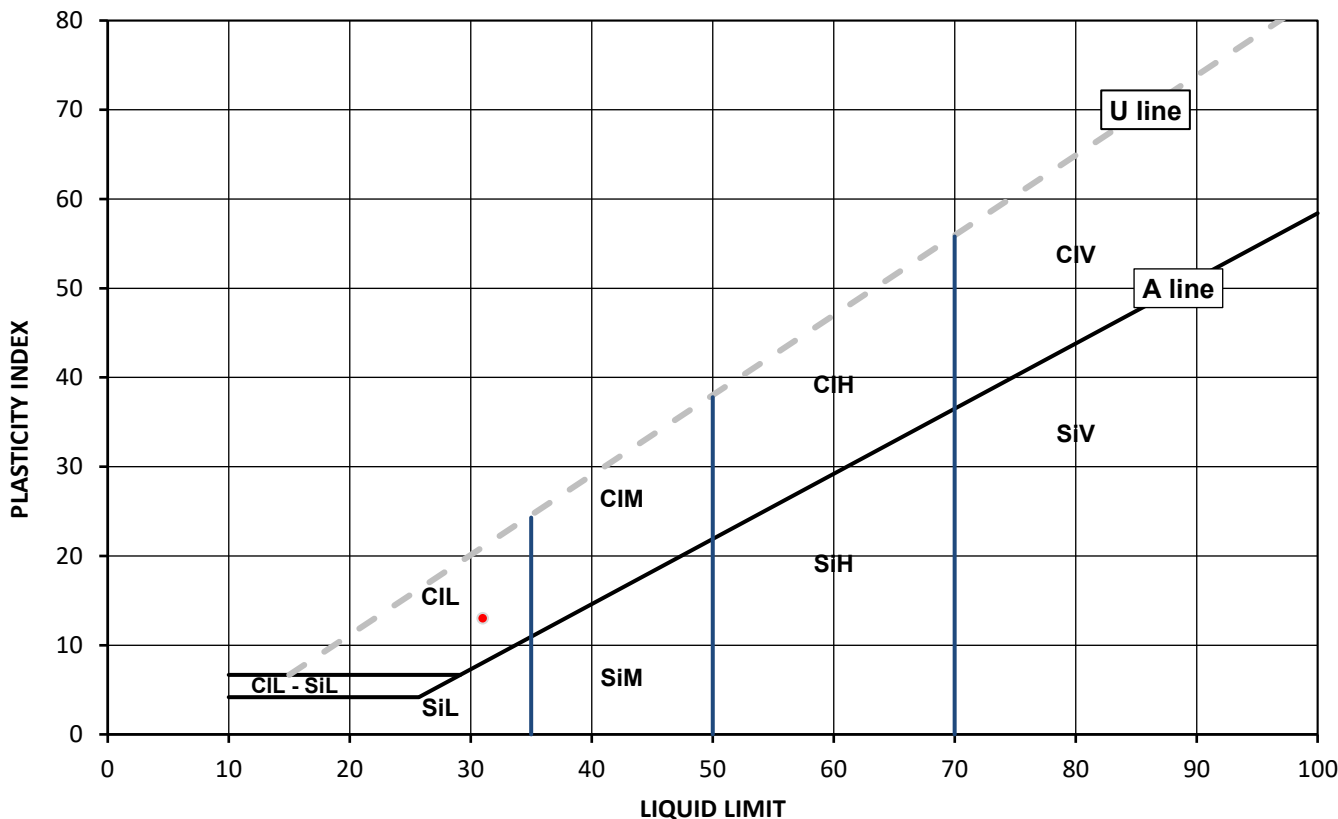
Test Results:

Laboratory Reference: 420716
Hole No.: Parcel A MWS101
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 0.60
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
21.6	31	18	13	0.31	0.69	96



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

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

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne Remaining Areas

Client Reference: 21949BA
Job Number: 25-000726-1
Date Sampled: 16/12/2024
Date Received: 17/12/2024
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

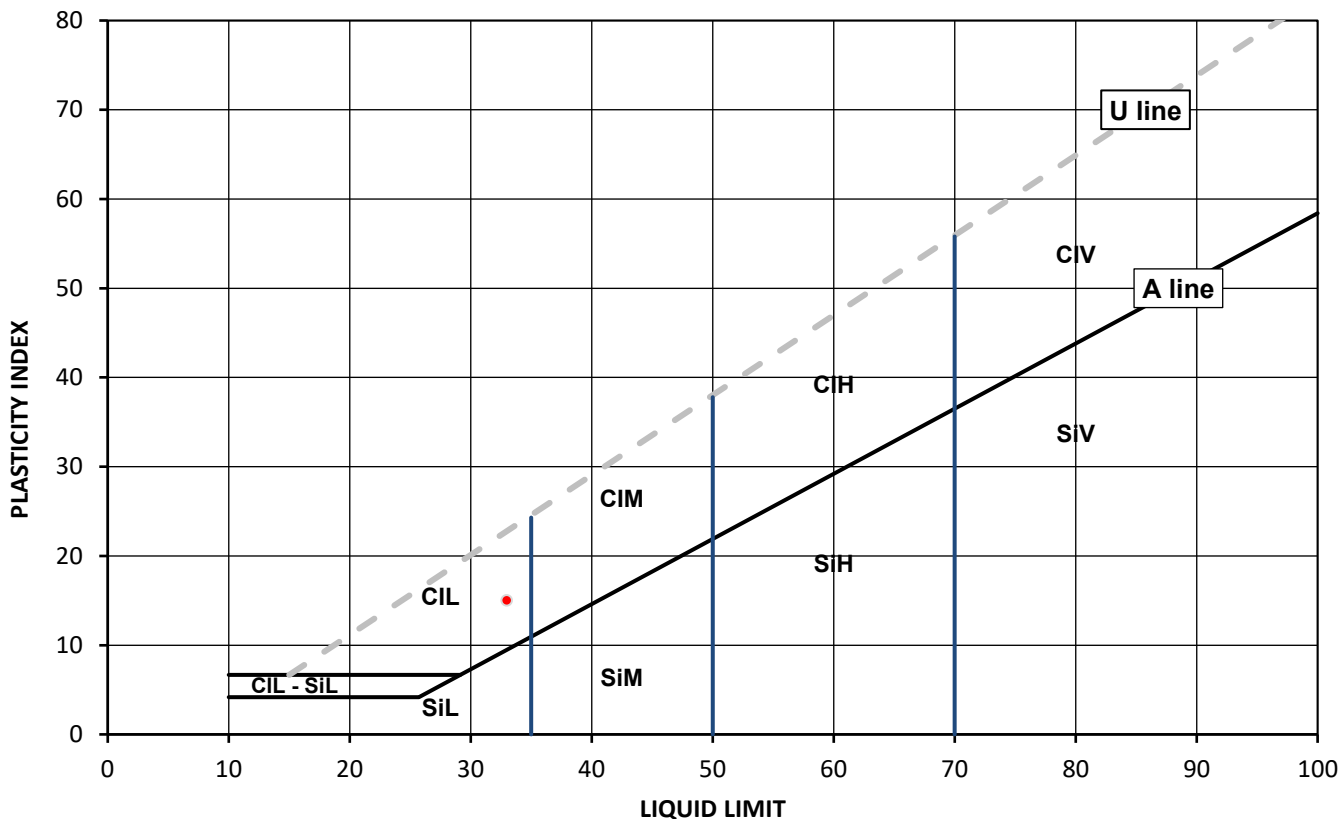
Test Results:

Laboratory Reference: 420717
Hole No.: Parcel A MWS106
Sample Reference: Not Given
Sample Description: Brown very sandy CLAY

Depth Top [m]: 0.80
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
17.5	33	18	15	0.00	1.00	100



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

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

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041

**TEST CERTIFICATE****DETERMINATION OF LIQUID AND PLASTIC LIMITS**

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne Remaining Areas

Client Reference: 21949BA
Job Number: 25-000726-1
Date Sampled: 16/12/2024
Date Received: 17/12/2024
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

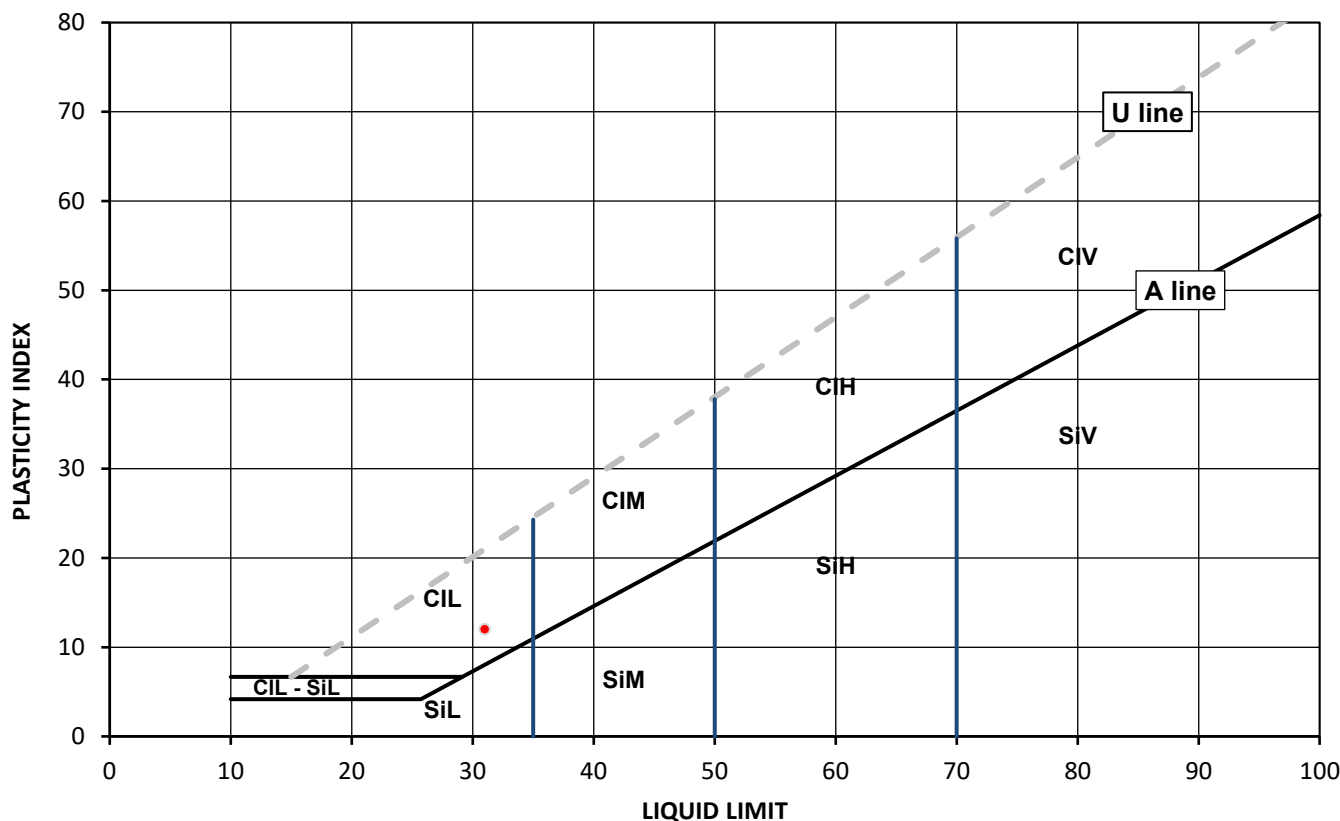
Test Results:

Laboratory Reference: 420718
Hole No.: Parcel A MWS102
Sample Reference: Not Given
Sample Description: Brown very sandy CLAY

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
17.0	31	19	12	-0.17	1.17	100



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

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

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

Client: Merebrook
Client Address: First Floor, 1 Leonard Place,
Westerham Road, Keston,
BR2 6HQ
Contact: Tim Stempt
Site Address: Ingrebourne Remaining Areas

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt
Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: 21949BA
Job Number: 25-000726-1
Date Sampled: 16/12/2024
Date Received: 17/12/2024
Date Tested: 14/01/2025
Sampled By: Client - Tim Stempt

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD
			m	m					%	%		%	%			Mg/m3	Mg/m3	Mg/m3
420715	Remaining Areas MWS118	Not Given	0.50	Not Given	D	Brown very sandy CLAY	Atterberg 4 Point	22.0	100	33	-	17	16	80g/30 deg	N / I			
420716	Parcel A MWS101	Not Given	0.60	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	21.6	96	31	-	18	13	80g/30 deg	R / I			
420717	Parcel A MWS106	Not Given	0.80	Not Given	D	Brown very sandy CLAY	Atterberg 4 Point	17.5	100	33	-	18	15	80g/30 deg	N / I			
420718	Parcel A MWS102	Not Given	0.50	Not Given	D	Brown very sandy CLAY	Atterberg 4 Point	17.0	100	31	-	19	12	80g/30 deg	N / I			
420719	Remaining Areas MWS113	Not Given	1.20	Not Given	D	Brown sandy CLAY	Atterberg 4 Point	15.8	100	38	-	21	17	80g/30 deg	N / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased ,
D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:

Katarzyna
Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Merebrook
First Floor
1 Leonard Place
Westerham Road
Keston
BR2 6HQ

t: 01689 889980

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

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 25-000580

Project / Site name:	Ingrebourne-Parcel A	Samples received on:	09/01/2025
Your job number:	21949BA	Samples instructed on/ Analysis started on:	09/01/2025
Your order number:	25-2-FDO-LABS	Analysis completed by:	15/01/2025
Report Issue Number:	1	Report issued on:	15/01/2025
Samples Analysed:	5 soil samples		



Signed: _____

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

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-000580
Project / Site name: Ingrebourne-Parcel A
Your Order No: 25-2-FDO-LABS

Lab Sample Number				420098	420099	420100	420101	420102
Sample Reference				Parcel A MWS101	Parcel A MWS102	Parcel A MWS104	Parcel A MWS104	Parcel A MWS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				1.70	1.00	1.00	2.00	1.00
Date Sampled				16/12/2024	16/12/2024	16/12/2024	16/12/2024	16/12/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	12	12	15	19
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.6	7	6.9	7	7.8
Total Sulphate as SO ₄	%	0.005	MCERTS	0.037	0.018	0.02	0.026	0.034
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	25	24	34	120
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.1	12.7	11.8	17.1	57.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.1	1.5	1.5	0.9	1.6
Total Sulphur	mg/kg	50	MCERTS	120	55	60	110	760
Total Sulphur	%	0.005	MCERTS	0.012	0.006	0.006	0.011	0.076
Ammoniacal Nitrogen as NH ₄ ⁺	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonium as NH ₄ ⁺ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	< 2.5	< 2.5	4.8	6.2
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0	9.5	12

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

Analytical Report Number : 25-000580

Project / Site name: Ingrebourne-Parcel A

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
420098	Parcel A MWS101	None Supplied	1.7	Brown clay and sand with vegetation
420099	Parcel A MWS102	None Supplied	1	Brown sandy clay
420100	Parcel A MWS104	None Supplied	1	Brown sandy clay
420101	Parcel A MWS104	None Supplied	2	Brown sandy clay
420102	Parcel A MWS106	None Supplied	1	Brown clay and sand with vegetation

Analytical Report Number : 25-000580

Project / Site name: Ingrebourne-Parcel A

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

IDOM Merebrook (Keston) Limited

1 Leonard Place
Westerham Road
Keston
BR2 6HQ

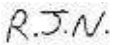
Page 1 of 1

For the attention of Dawn Drake

Report No: C9170

Issue No 1a

LABORATORY TEST REPORT

Project Name	IMBERHORNE LANE		
Project Number	C9170	Date samples received	
Your Ref		Date written instructions received	09/12/2024
Purchase Order	24-952-DD-21949ba	Date testing commenced	16/12/2024
Please find enclosed the results as summarised below			
Item No	Test Quantity	Description	ISO 17025 Accredited
10.05	8	Insitu CBR	Yes
Remarks :			
Issued by : R Norris		Date of Issue : 28/01/2025	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  28/01/2025			
J.Hopkins (Laboratory Coordinator), M D Brown (Senior Quality Manager), R Norris (Supervisor), R Collett (Site Supervisor), M Bryan (Senior Lab Technician)			
Unless we are notified to the contrary, any remaining samples will be disposed of, 4 weeks after the date this report was issued Results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced without written approval from Terra Tek Limited (Trading as igne) The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on this report may be left:			



Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

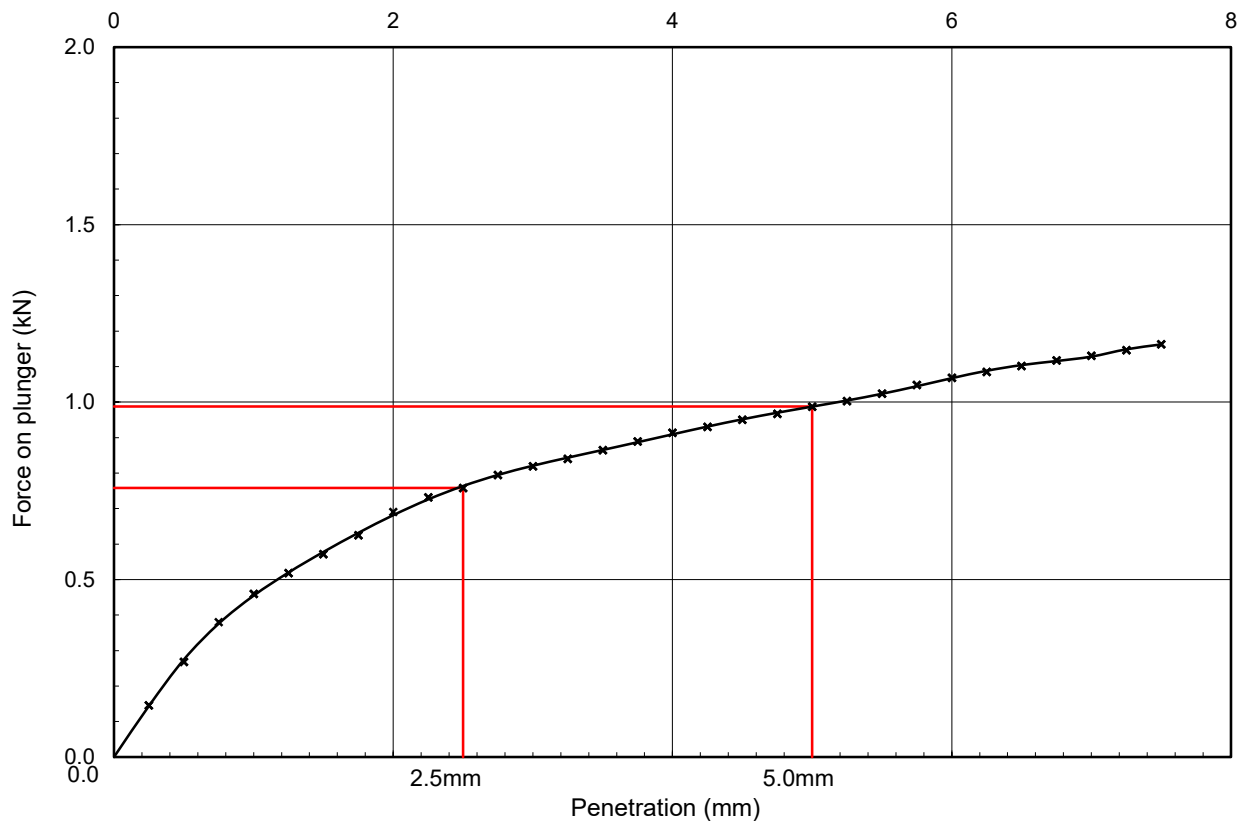
Contract No C9170
Test No CBR 01
Depth (m) 0.30
Test Date 16/12/2024

Test Location Parcel A MCBR 101
Non Engineering Description Brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 24 %
CBR Value: 5.7 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



Originator

Checked & Approved

RN

R.J.N.
28/01/2025

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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

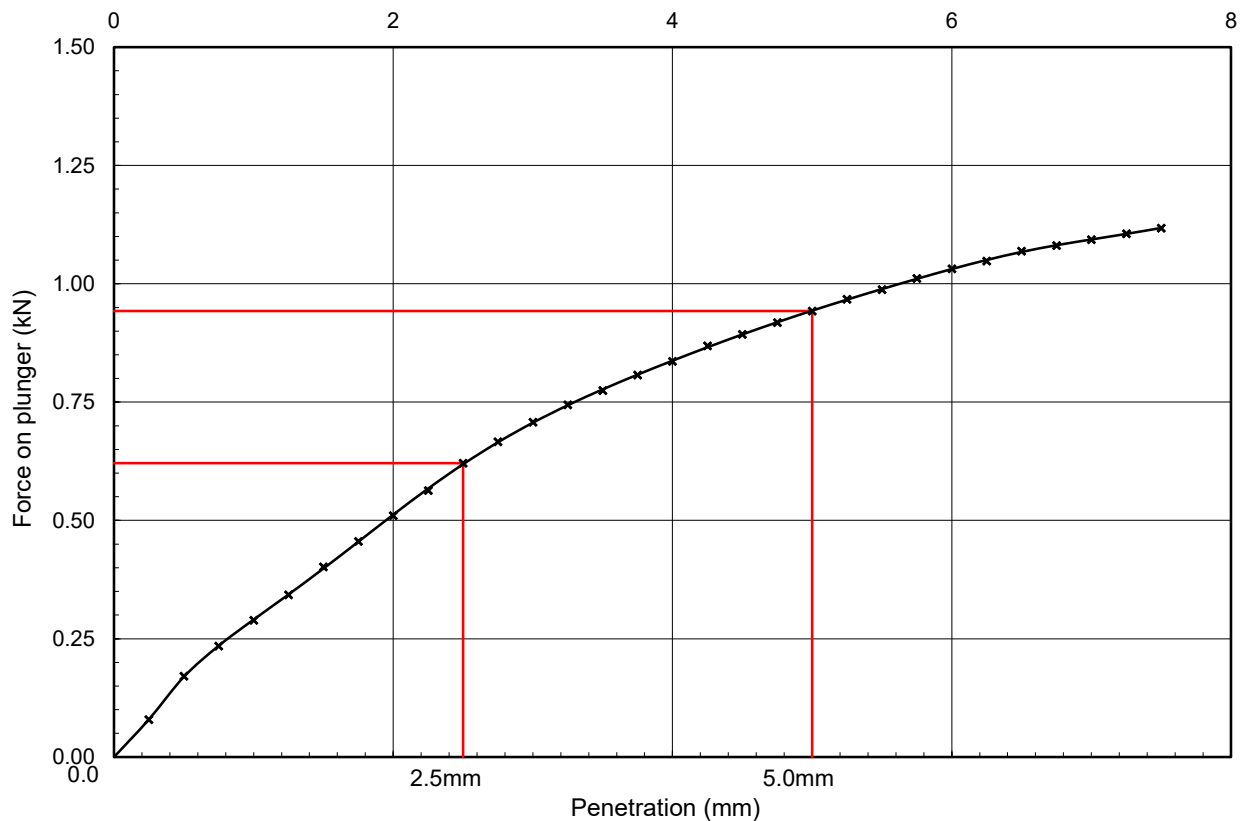
Contract No C9170
Test No CBR 02
Depth (m) 0.45
Test Date 16/12/2024

Test Location Parcel A MCBR 102
Non Engineering Description Brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 23 %
CBR Value: 4.7 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

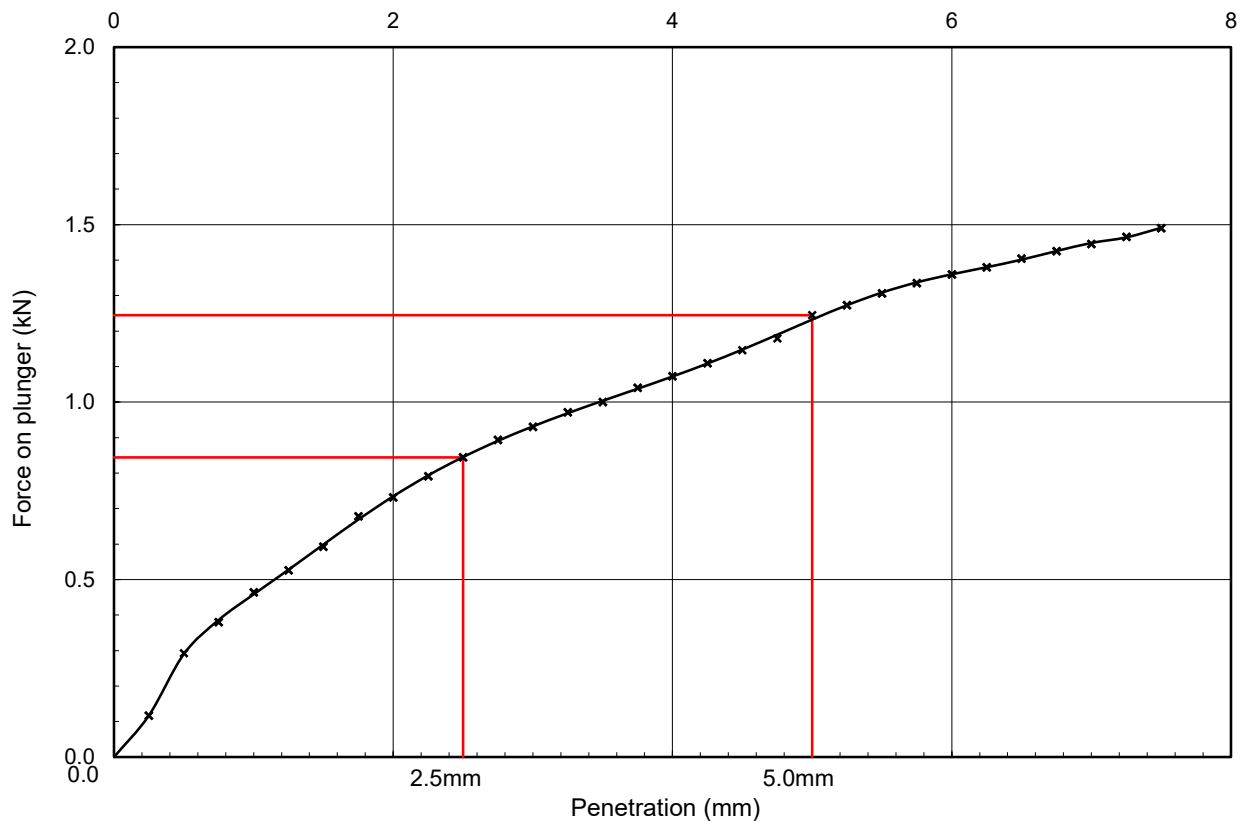
Contract No C9170
Test No CBR 03
Depth (m) 0.35
Test Date 16/12/2024

Test Location Parcel A MCBR 103
Non Engineering Description Brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 18 %
CBR Value: 6.4 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

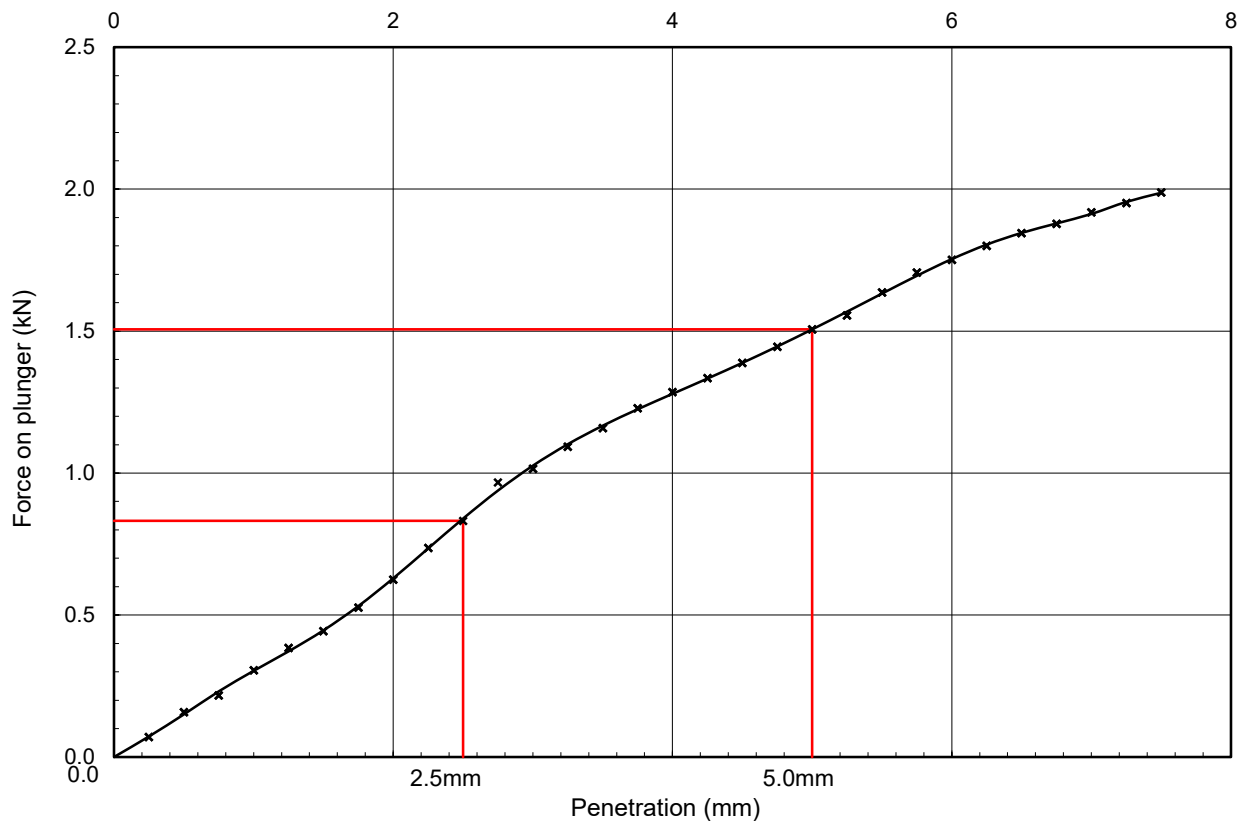
Contract No C9170
Test No CBR 04
Depth (m) 0.25
Test Date 16/12/2024

Test Location Parcel B MCBR 105
Non Engineering Description Light brown slightly gravelly very clayey SAND. Gravel is fine to coarse.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 20 %
CBR Value: 7.5 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

Contract No C9170
Test No CBR 05
Depth (m) 0.25
Test Date 16/12/2024

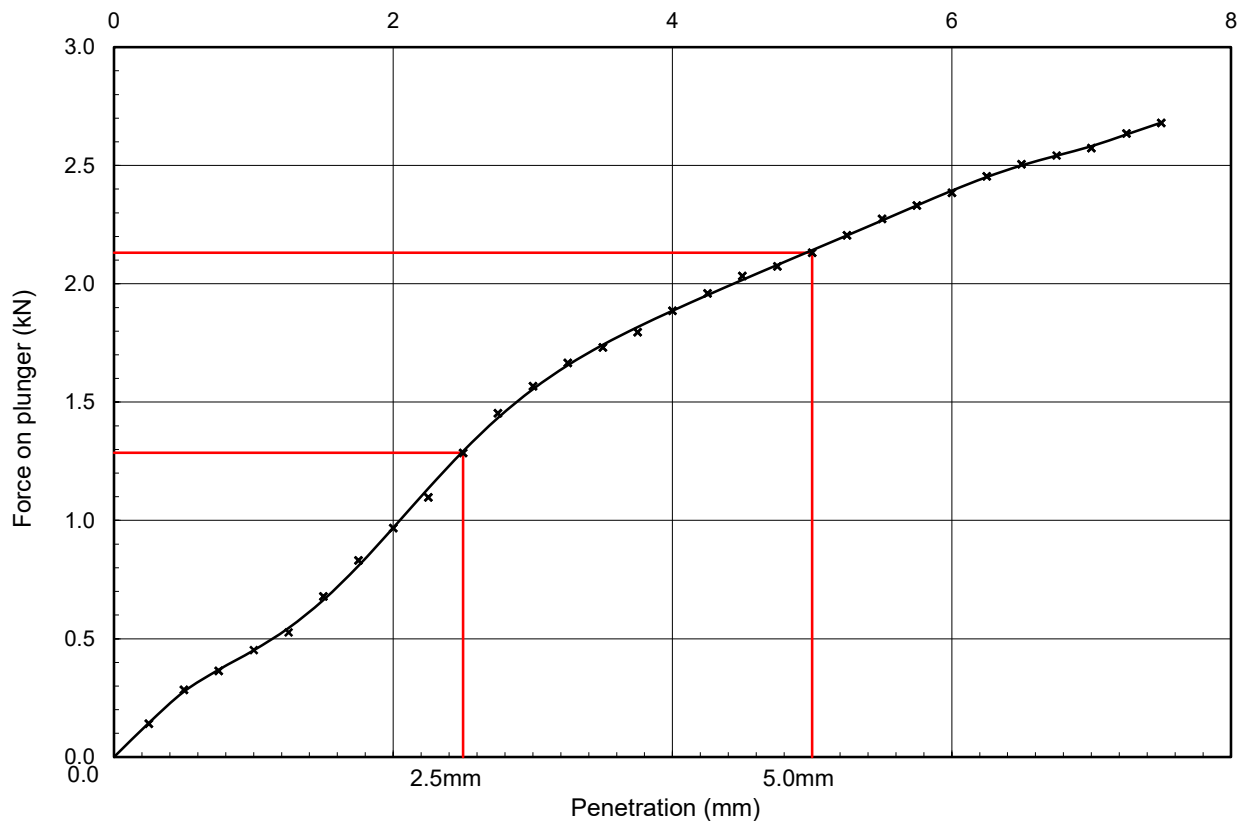
Test Location Parcel B MCBR 104
Non Engineering Description Light brown mottled grey slightly gravelly very clayey SAND. Gravel is fine to coarse with occasional cobbles.
Weather Overcast
Remarks Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 20 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.

CBR Value: 11 %



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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

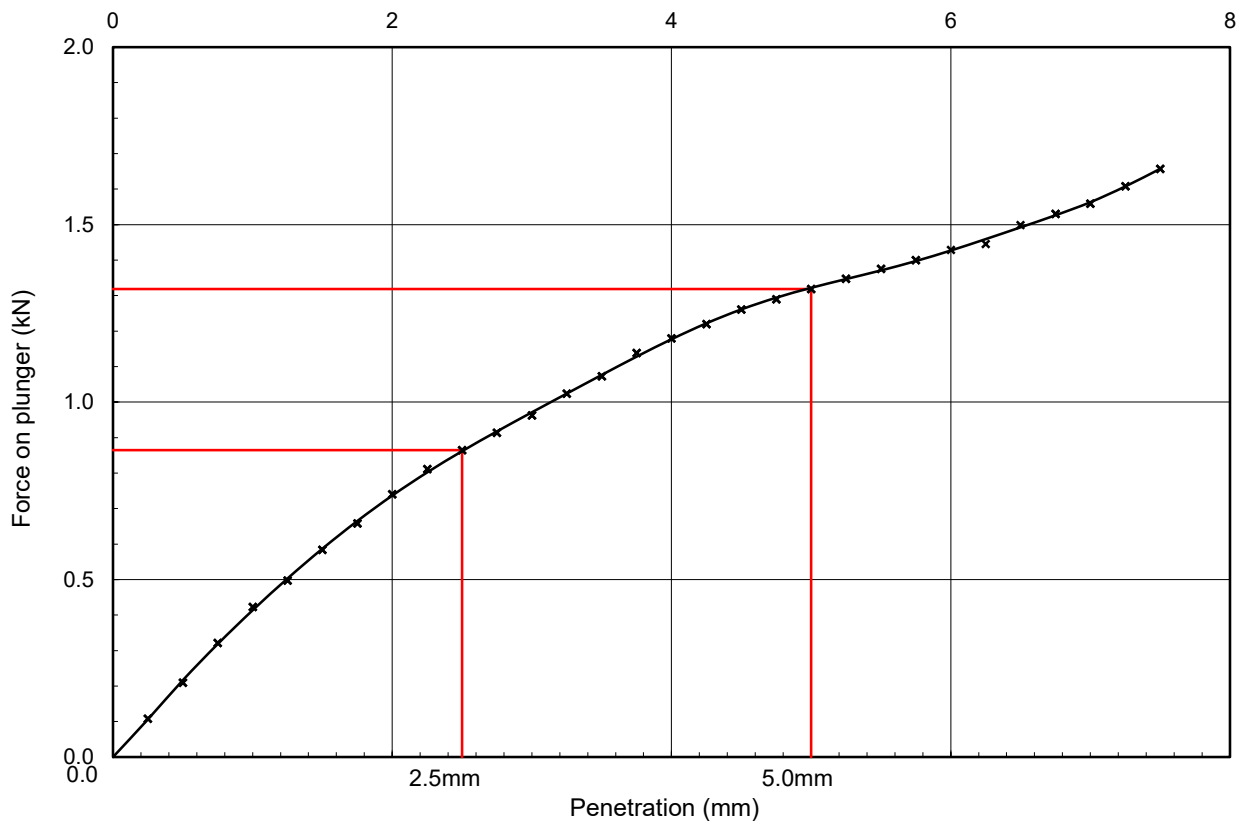
Contract No C9170
Test No CBR 06
Depth (m) 0.25
Test Date 16/12/2024

Test Location Parcel B MCBR 103
Non Engineering Description Light brown mottled grey slightly gravelly very clayey SAND. Gravel is fine to coarse.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 19 %
CBR Value: 6.6 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



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28/01/2025

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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

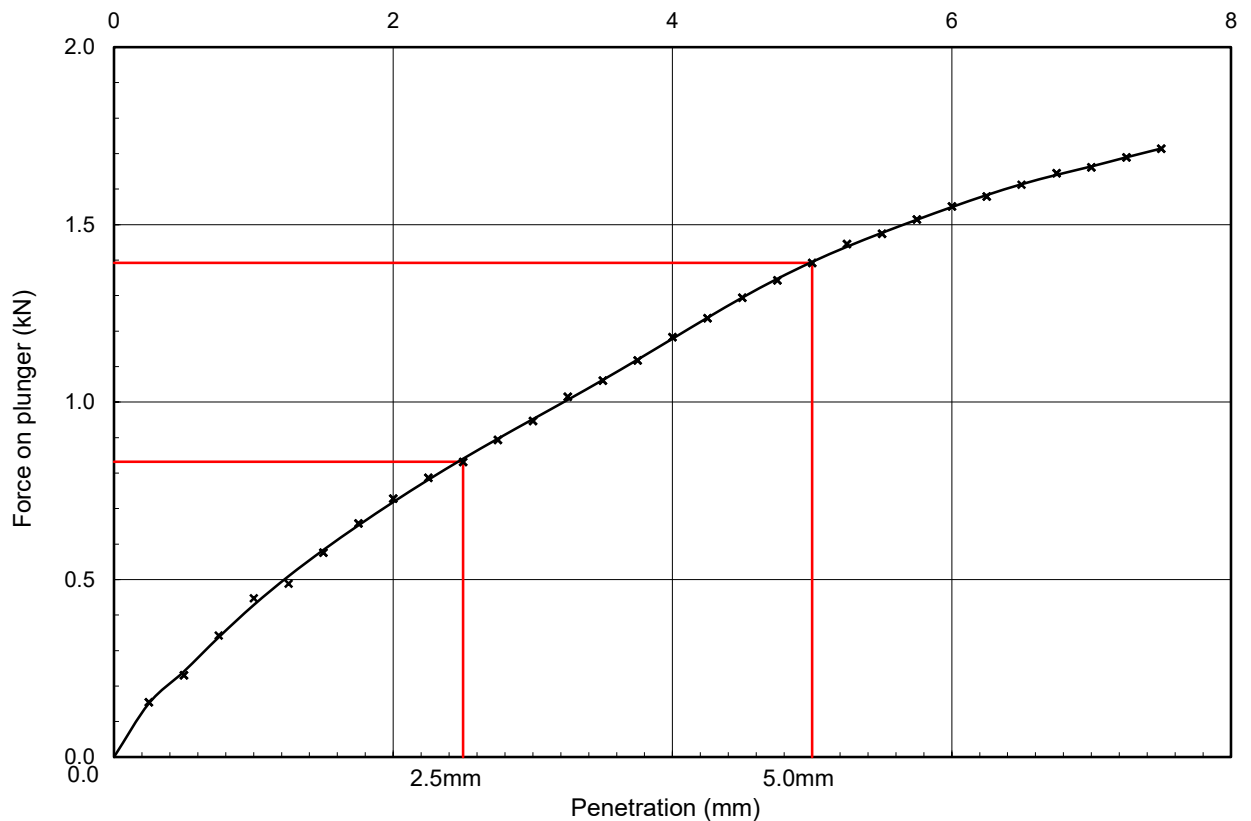
Contract No C9170
Test No CBR 07
Depth (m) 0.30
Test Date 16/12/2024

Test Location Parcel B MCBR 102
Non Engineering Description Light brown mottled grey slightly gravelly very clayey SAND. Gravel is fine to coarse.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 20 %
CBR Value: 7.0 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



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28/01/2025

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Site IMBERHORNE LANE
Client IDOM Merebrook (Keston) Limited
Engineer

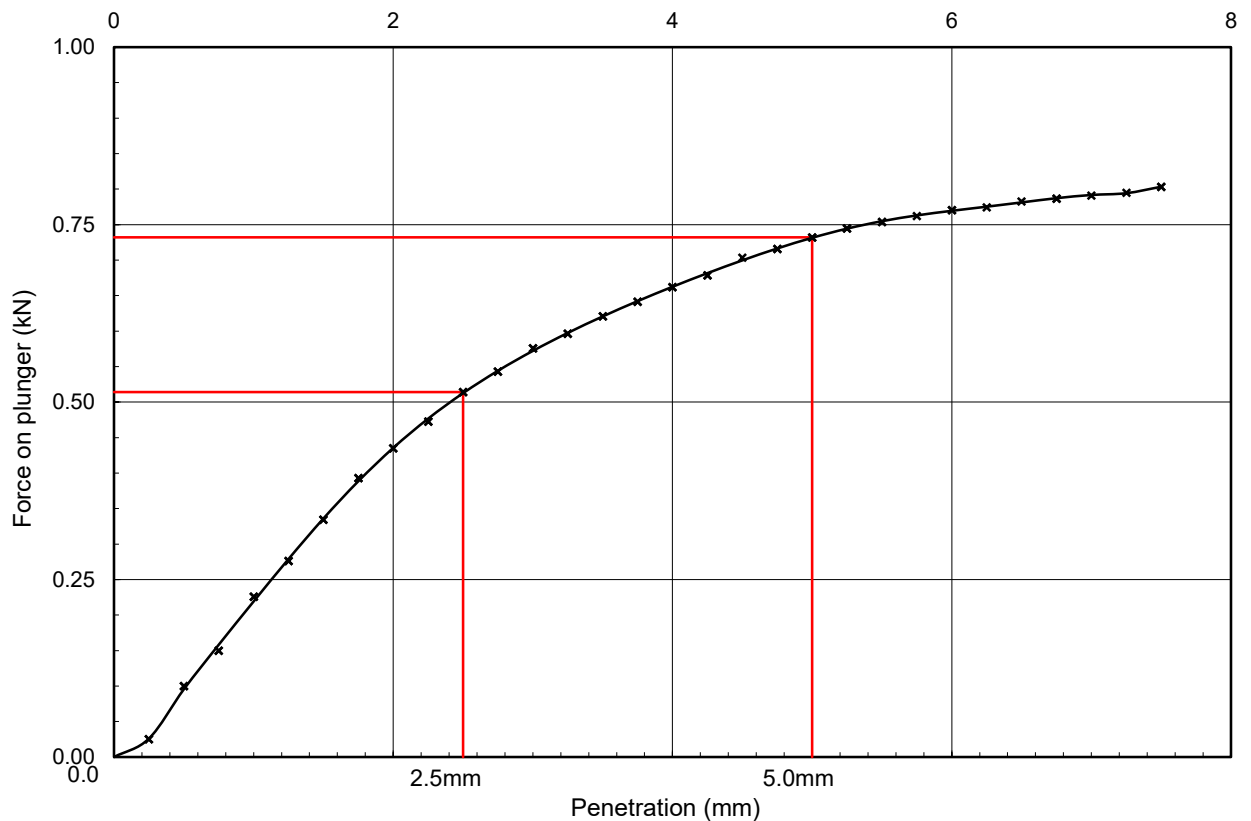
Contract No C9170
Test No CBR 08
Depth (m) 0.30
Test Date 16/12/2024

Test Location Parcel B MCBR 101
Non Engineering Description Light brown mottled grey slightly gravelly very clayey SAND. Gravel is fine to coarse.
Weather Overcast
Remarks No Particles greater than 20mm found beneath the plunger

Test Details:

Surcharge: 0.0 kg
Seating Load: 50 N
Moisture Content: 24 %
CBR Value: 3.9 %

The test load was applied using a hand operated screw jack.
The surcharge mass applied to the surface of the test area on a 250mm diameter ring. The rate of loading was maintained at 1.0 mm per minute.



Originator

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R.J.N.
28/01/2025

CALIFORNIA BEARING RATIO

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APPENDIX 6

- Groundwater Chemistry
- Laboratory Analysis Certificates

Merebrook
First Floor
1 Leonard Place
Westerham Road
Keston
BR2 6HQ

t: 01689 889980

e: mbaylis@idom.com
coliveira@idom.com

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

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 25-000704

Project / Site name:	Parcel A - Imberhorne Lane	Samples received on:	09/01/2025
Your job number:	21949BA	Samples instructed on/ Analysis started on:	09/01/2025
Your order number:	25-2-FDO-LABS	Analysis completed by:	15/01/2025
Report Issue Number:	1	Report issued on:	15/01/2025
Samples Analysed:	2 water samples		

Signed:



Rachel Chappell
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-000704

Project / Site name: Parcel A - Imberhorne Lane

Your Order No: 25-2-FDO-LABS

Lab Sample Number	420611			420612	
Sample Reference	MWS101-EW			MWS103-EW	
Sample Number	None Supplied			None Supplied	
Water Matrix	Other water			Other water	
Depth (m)	None Supplied			None Supplied	
Date Sampled	08/01/2025			08/01/2025	
Time Taken	None Supplied			None Supplied	
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status		

General Inorganics

pH (L099)	pH Units	N/A	NONE	7.4	7.4
Total Cyanide	µg/l	10	NONE	< 10	< 10
Sulphate as SO ₄	µg/l	45	NONE	26900	21100
Sulphide	µg/l	5	NONE	< 5.0	< 5.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	2.55	1.72

Total Phenols

Total Phenols (monohydric)	µg/l	10	NONE	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	NONE	0.63	0.42
Cadmium (dissolved)	µg/l	0.02	NONE	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	NONE	0.8	0.5
Copper (dissolved)	µg/l	0.5	NONE	1.9	4.4
Lead (dissolved)	µg/l	0.2	NONE	0.3	< 0.2
Mercury (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	NONE	3	3.3
Selenium (dissolved)	µg/l	0.6	NONE	0.9	0.8
Zinc (dissolved)	µg/l	0.5	NONE	0.9	2

Calcium (dissolved)	mg/l	0.012	NONE	87	80
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0

Analytical Report Number: 25-000704

Project / Site name: Parcel A - Imberhorne Lane

Your Order No: 25-2-FDO-LABS

Lab Sample Number	420611	420612
Sample Reference	MWS101-EW	MWS103-EW
Sample Number	None Supplied	None Supplied
Water Matrix	Other water	Other water
Depth (m)	None Supplied	None Supplied
Date Sampled	08/01/2025	08/01/2025
Time Taken	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection
		Test Accreditation Status

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	NONE	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0	< 3.0
Benzene	µg/l	3	NONE	< 3.0	< 3.0
Toluene	µg/l	3	NONE	< 3.0	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0	< 3.0
o-xylene	µg/l	3	NONE	< 3.0	< 3.0

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

Analytical Report Number : 25-000704

Project / Site name: Parcel A - Imberhorne Lane

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited matrices: SW, PW, GW, except B - SW, GW, Hg - SW, PW, Al - SW, PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Sulphide in water	Determination of sulphide in water by ion selective electrode	In-house method	L029-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Total Petroleum Hydrocarbons with carbon banding in water by GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
BTEX and/or Volatile Organic Compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method based on USEPA 8260	L073B	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5-diphenylcarbazide, followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method by continuous flow analyser	L080-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total cyanide in water	Determination of total cyanide in water by distillation followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total Petroleum Hydrocarbons in water by HS-GC-MS	Determination of total petroleum hydrocarbons in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method	L088-PL	W	NONE
pH of water at 20°C (automated)	Determination of pH of water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE, LL	In-house method	L099-PL	W	NONE

Analytical Report Number : 25-000704

Project / Site name: Parcel A - Imberhorne Lane

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAHs) in water by extraction in dichloromethane followed by GC-MS. Accredited matrices (PAHs): SW, PW, GW	In-house method based on USEPA 8270	L102B	W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, FSE, LL; PrW, DI PrW (Al, Cu, Fe, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

APPENDIX 7

- Field Monitoring Records
- Groundwater Level Data
- Hazardous Soil Gas Data

GAS MONITORING RECORD ROUND 1

Location Reference	Time	Flow and Pressure Measurements				Gas Measurements								VOC Measurements		Dip Measurements		Comments		
		Flow		Atmospheric Pressure	Differential Pressure	Methane Max	Methane Steady	Methane LEL	Carbon Dioxide Max	Carbon Dioxide Steady	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Time Taken to Reach Steady State	Hexane	PID	Depth to Water		Depth to Base	
		max	steady																	
		l hr ⁻¹																		
MWS101	09:00	9.6	0	997	0	0	0	0	0.3	0.3	20.3	0	0	60.000	0.000	1	0.56	1.66	-	
MWS103	09:30	0	0	997	0	0	0	0	0.1	0.1	20.2	0	0	60.000	0.000	0	0.62	1.73	-	
MWS106	09:45	0	0	997	0	0	0	0	0.9	0.9	9.6	0	0	60.000	0.000	1	Dry	1.00	-	
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Weather:		Slightly rainy. Atmospheric Pressure falling during the past 30 hours.				nr = not recorded					Gas Analyser		PID		Site:				Imberhorne Lane, Parcel A	
						Model:					GFM436		MiniRae 3000		Project Number:				21949ba	
						Serial Number:					12228		592-931891		Monitored By:				Finn Leahy	
						Date of Last Calibration:					17/10/2024		01/02/2024		Date:				18/12/2024	

GAS MONITORING RECORD ROUND 2

Location Reference	Time	Flow and Pressure Measurements				Gas Measurements								VOC Measurements		Dip Measurements		Comments		
		Flow		Atmospheric Pressure	Differential Pressure	Methane Max	Methane Steady	Methane LEL	Carbon Dioxide Max	Carbon Dioxide Steady	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Time Taken to Reach Steady State	Hexane	PID	Depth to Water		Depth to Base	
		max	steady																	
		l hr ⁻¹																		
MWS101	13:10	0	0	999	0	0	0	0	0.4	0.4	20.3	0	0		0.000	0	0.45	1.66	Groundwater sample taken	
MWS103	13:40	0	0	1000	0	0	0	0	0.7	0.7	19.6	0	0		0.000	0	0.60	1.73	Groundwater sample taken	
MWS106	14:00	0	0	999	0	0	0	0	0.5	0.5	11.3	0	0		0.000	1	DRY	1.00	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	
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Weather:		Overcast and cloud. Atmospheric pressure falling during the past 5 hours				nr = not recorded					Gas Analyser		PID		Site:				Imberhorne Lane, Parcel A	
						Model:					GFM436		MiniRae 3000		Project Number:				21949ba	
						Serial Number:					12228		592-931891		Monitored By:				Matt Baylis	
						Date of Last Calibration:					17/10/2024		01/02/2024		Date:				08/01/2025	

APPENDIX 8 ▪ Risk Assessment Methodology

RISK ASSESSMENT METHODOLOGY (FOLLOWING CIRIA C552, 2001)

The potential sources of contamination at the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment.

The existence of a pollutant linkage requires a pathway by which the receptor could be exposed to the source.

Where a complete pollutant linkage is deemed to be present, the level of *risk* is then determined taking into account the *likelihood* of significant impact and the *severity* of potential impact using the following classification tables which broadly follow the method set out in CIRIA C552.

Table A1: Classification of Severity (or Consequence)

CLASSIFICATION	DEFINITION
Severe	Short term (acute) risk to human health likely to result in “significant harm” as defined by the Environment Protection Act 1990, Part IIA. Short term risk of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem or organism forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).
Medium	Chronic damage to Human Health (“significant harm” as defined in DETR, 2000). Pollution of sensitive water resources, significant change in a particular ecosystem or organism forming part of such ecosystem.
Mild	Pollution of non sensitive water resources. Significant damage to crops, buildings, structures and services (“significant harm” as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.

Table A2: Classification of Likelihood (Probability)

CLASSIFICATION	DEFINITION
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Table A3: Risk Estimation – Combination of Consequence and Probability(after CIRIA C552 and R&D66)

		MAGNITUDE OF POTENTIAL CONSEQUENCE (SEVERITY) OF RISK			
		SEVERE	MEDIUM	MILD	MINOR
LIKELIHOOD OF RISK	HIGH LIKELIHOOD	Very High Risk	High Risk	Moderate Risk	Low Risk
	LIKELY	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	LOW LIKELIHOOD	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	UNLIKELY	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table A4: Description of the Classified Risks and Likely Reaction Required

CLASSIFICATION	DEFINITION
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX 9 ▪ Gas Risk Assessment

MODIFIED WILSON AND CARD GAS CHARACTERISTIC SITUATION

SITE: Imberhorne Lane, Parcel A JOB NUMBER: 21949ba 15/01/2025

Modified Wilson and Card Classification

					BS 8485:2015+A1:2019 Gas Protection Scores - refer to standard for full guidance			
					Minimum Gas Protection Score Required			
Characteristic Situation	Risk Classification	Gas Screening Value Threshold (L hr ⁻¹)	Additional Factors	Typical Source of Generation	Type A Building	Type B Building	Type C Building	Type D Building
1	very low risk	<0.07	typically methane not to exceed 1% and/or carbon dioxide 5% otherwise consider increase to situation ²	natural soils with low organic content; 'typical' made ground	0	0	0	0
2	low risk	0.07 to <0.7	borehole air flow rate not to exceed 70 L hr ⁻¹ otherwise consider increase to situation ³	natural soils with high peat/organic content; 'typical' made ground	3.5	3.5	2.5	1.5
3	moderate risk	0.7 to <3.5		old landfill, inert waste, mineworking flooded	4.5	4	3	2.5
4	moderate to high risk	3.5 to <15	quantitative risk assessment required to evaluate scope of protective measures	mineworking susceptible to flooding, completed landfill	6.5 ^{A)}	5.5 ^{A)}	4.5	3.5
5	high risk	15 to <70		mineworking unflooded inactive with shallow workings near surface	hazard too high for this method to define protection measures	6 ^{A)}	5.5	4.5
6	very high risk	>70		recent landfill site	hazard too high for this method to define protection measures	hazard too high for this method to define protection measures	hazard too high for this method to define protection measures	6

BS 8485:2015+A1:2019 Gas Protection Measures - refer to standard for full guidance					
Select two or more elements from the following three types of protection to achieve score (only one element per type permitted)					
Structural Barrier	Score ^{A)}	Ventilation Measures		Score	Gas Resistant Membrane
Precast suspended segmental subfloor (i.e. beam and block)	0	Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)		0.5	Gas resistant membrane meeting all of the following criteria: 1. sufficiently impervious, both in the sheet material and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane. A membrane with a methane gas transmission rate <40.0 ml/day/m2/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1:2007 manometric method) is regarded as sufficiently impervious. 2. sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions 3. sufficiently strong* to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc) and to withstand in-service stresses (e.g. settlement if placed below a floor slab) 5. capable, after installation, of providing a complete barrier to the entry of the relevant gas 6. verified in accordance with CIRIA C735 * For example, reinforced LDPE (virgin polymer) membranes having a minimum mass per unit area of 370 g/m2 and not significantly less than 0.4 mm thickness between the reinforcement scrim (tested in accordance with Procedure D (2 mm diameter tip) of BS EN ISO 9863-1:2016) installed above floor slabs are considered sufficiently strong to meet the performance criteria (see also C.3). Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast-in-situ floor slabs
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5	Passive sub floor dispersal layer	Very good performance ^{E)}	2.5	
			Good performance ^{E)}	1.5	
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 ^{B)}	Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers ^{E)}		1.5 to 2.5	
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing ^{C) D)}	2	Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket ^{E)}		1.5 to 2.5	
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing ^{C) D)}	2.5	Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park) ^{F)}		4	

- Notes**

A) The scores are conditional on breaches of floor slabs, etc., being effectively sealed

C) The score is conditional on the waterproofing being provided by a suitable structural barrier with the design and detailing of the walls and floor meeting the requirements for Type B protection. The score cannot be assigned for Type A (waterproof membrane) or Type C (drained cavity wall).

E) Refer to BS 8485:2015 Annex B to determine performance and assign score
- B) To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in

D) If a membrane is installed beneath and around the basement to provide Type A waterproofing (BS 8102:2009), it can be assigned a gas protection score in accordance with Table 7, if it meets all the criteria for a gas resistant membrane in that table

F) Assumes that the car park is vented to deal with car exhaust fumes, designed to Buildings Regulations 2000, Approved Document F

Building Types

Type A
Private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises.

FOR TYPE A BUILDINGS ACTIVE VENTILATION MEASURES ARE INAPPROPRIATE

- Type B**
Private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the building, including the gas protection measures. Multiple occupancy. Small to medium size rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.
- Type C**
Commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).
- Type D**
Industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C).

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