

PHASE II GEOENVIRONMENTAL SITE ASSESSMENT

Site:	Wilson Road, Huyton
References:	18-824-R2-1
Date:	21 May 2026
Client:	DJL Construction NW Ltd





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QUALITY ASSURANCE

Report references

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EXECUTIVE SUMMARY

SITE DESCRIPTION AND HISTORY

Site Address	Wilson Road, Huyton, Liverpool L36 6AE
Grid Reference	E 345759, N 389967
Site Area	4.54 Ha
Proposed Development	DJL Construction NW Ltd intends to construct a steel-framed industrial warehouse building with associated access, parking and landscaping.
Current Site Use	The subject site comprises an irregular-shaped parcel of land located east of Liverpool and is currently occupied by John Mason International Movers and associated car and lorry parking. Site activities at John Mason International Movers include international shipping, packing, loading containers, service and collection. The site comprises a large steel-framed two-storey warehouse with a brick front along the western side of the building, situated in the south of the site. An electricity substation is present in the west of the site. A further small brick building is present in the northwest. The northern area of the site is used for vehicle/HGV and equipment storage. The east and southeast of the site is currently used to store caravans
Site History	The earliest historical mapping dated 1849-1850 records Logwood Farm and Logwood Corn Mill in the central sector. The Corn Mill is no longer recorded by 1892. By 1974, Logwood Farm is no longer present on-site and a large warehouse is recorded in the south of the site. Additional structures are recorded in the northwestern sector of the site, including a Canning Factory. By 1977, two further structures are present to the south of the warehouse and an electricity substation is recorded in the northwest. The buildings in the north and to the south of the warehouse are no longer recorded by 2015. The warehouse is present to the current day.

ENVIRONMENTAL SETTING

Geology	Superficial Geology	Glacial Till – Diamicton (CLAY, SAND, GRAVEL)
	Bedrock Geology	Pennine Lower Coal Measures Formation (West) – MUDSTONE, SILTSTONE and SANDSTONE
		Pennine Middle Coal Measures Formation (North) – SANDSTONE
		Pennine Middle Coal Measures Formation (North) – MUDSTONE, SILTSTONE and SANDSTONE.
		Etruria Formation (East) – MUDSTONE, SANDSTONE and CONGLOMERATE.



Geology <i>...Continued</i>	Faults	A fault bisects the central portion of the site, trending north to south, with the downthrow to the west. There is a fault bisecting the northeastern portion of the site, trending northwest to southeast, with the downthrow to the southwest. The fault at the western boundary trends from north to south, with the downthrow to the east.
Geomorphology	It is likely that the site was historically levelled to form the current level development platform.	
Hydrogeology	The site is underlain by a Secondary Undifferentiated superficial aquifer and a Secondary A bedrock aquifer. The site is not located within a groundwater source protection zone, however there is a Zone 3 - Total Catchment 225 m southeast of the site. There are no groundwater/potable abstractions within 1 km of the site.	
Hydrology	Prescot Brook (Logwood Mill Brook) runs along the eastern site boundary. The site is predominantly located within a currently defined "Flood Risk Zone 1" with a low risk of flooding from rivers. However the land surrounding Logwood Mill Brook to the east is within "Flood Risk Zone 3", defined as an area with a high risk of flooding from rivers.	
Utility Locations	Utility connections are available throughout Wilson Road. A surface water sewer is recorded to cross the north of the site. Combined sewers are recorded along the northern boundary and in the south of the site, with connections to the existing warehouse. An electricity substation is present in the northwest of the site.	
Landfill Sites and Waste Sites	No active landfill sites have been identified within 250 m of the site boundary. However, there is one historical landfill EA/NRW records 88 m NW of the site at Brickfields, Knowsley, Merseyside for inert waste. There are ten historical waste sites within 250 m of the site. Furthermore, there are 19 licensed waste sites within 250 m of the site. Forty-three waste exemptions have been identified within 250 m of the site.	
Radon	The site is situated in an area where less than 1% of homes are above the "Action Level". Therefore, the BGS reports that radon protective measures are not necessary for the construction of new dwellings or extensions.	
Unexploded Ordnance	The site is recorded to be at a moderate risk from unexploded ordnance. Brimstone have completed a Stage 1 Preliminary UXO Risk Assessment (Ref: PRA-26-3004, dated 03/03/2026). The report suggests that further investigation and a Stage 2 Detailed Risk Assessment is not required. However, a UXO Safety Briefing is prudent to all personnel conducting groundworks.	
Hazardous Installations	No hazardous installations that could potentially prejudice the construction of the proposed commercial development have been identified.	



E3P GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation comprising: ✿ 12 x window sample probeholes; ✿ 4 x rotary boreholes; and ✿ 9 x environmental monitoring installations. Given the active nature of the site, exploratory hole locations could not be completed within the majority of the warehouse. WS112B was positioned on a raised platform within the warehouse, however it was not possible to penetrate the full depth of the concrete.
Ground Conditions	Made Ground – GL–5.40 m bgl Made Ground was encountered in all exploratory hole locations to a maximum proven depth of 5.40 m bgl (RB103). However, Made Ground was generally present to a depth of less than 2.00 m bgl. Typically, the Made Ground comprises greyish brown sandy gravel of mudstone, sandstone and limestone from ground level. In the majority of locations, this is underlain by dark brown slightly sandy gravelly clay extending to a proven depth of 2.00 m bgl (WS106, WS107, WS108). Reworked topsoil, comprising sandy gravel or gravelly sand, was recorded at three locations (WS104, WS106, WS108). Concrete was encountered at four locations (WS101, WS112A, RB102, RB105) from ground level to a maximum depth of 0.35 m bgl (WS101). WS112B was positioned on a raised platform within the warehouse and encountered concrete to a depth in excess of 0.40 m bgl, it was not possible to penetrate the full depth of the concrete. Superficial – 0.80–5.45 m bgl Natural superficial deposits were identified within all exploratory hole locations at a depth of between 0.80 – 5.45 m bgl (WS108), with the exception of RB103 where the Made Ground deposits were directly underlain by bedrock. The natural deposits primarily consisted of either sandy CLAY or sandy gravelly CLAY, proven from depths of between 0.80–5.45 m bgl. Cohesive deposits generally ranged in consistency and strength, varying from firm low strength to very stiff high strength. A band of COAL was encountered within the cohesive deposits in WS109 at 1.60 – 1.80 m bgl. Brown gravelly fine to coarse SAND was identified within four exploratory locations, locally interbedded within the cohesive deposits between 0.30–4.00 m bgl. Where deposits were identified, the stratum was noted at a thickness of between 0.30–0.70 m and the soils were recorded to be loose.



Ground Conditions ...Continued	Bedrock Geology – 1.70 – 40.00 m bgl Bedrock was identified within all of the rotary boreholes and two of the window sample boreholes at depths of between 1.70 – 40.00 m bgl. Rockhead was encountered at depths of between 1.70 m and 3.10 m bgl. The bedrock generally comprises red/grey SANDSTONE, or grey MUDSTONE with the presence of MUDSTONE, SANDSTONE and SILTSTONE bands or coal traces. Coal seams were identified within RB101 between 3.80 – 4.90 m bgl, RB102 between 3.00 – 3.60 m bgl, and multiple seams within RB105 between 6.20 – 7.00 m bgl, 7.60 – 8.50 m bgl, 15.10 – 15.70 m bgl, and 21.40 – 22.30 m bgl. Groundwater Groundwater strikes were recorded in the natural superficial deposits within three of the exploratory hole locations, between 2.00–2.50 m bgl. Subsequent monitoring completed to date has recorded groundwater between 0.60–2.94 m bgl. Visual/Olfactory Evidence of Contamination No visual or olfactory evidence of contamination was encountered during the ground investigation.
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CONTAMINATED LAND ASSESSMENT

Human Health Risk Assessment	No elevated concentrations of heavy metals, PAHs, or TPHs have been identified in the chemical soil analysis. Given the sites' prolonged use as industrial land, there is still considered to be a potential residual risk from areas that were not previously investigated. However, given the low sensitivity of the proposed development and the limited areas of potential soft landscaping, it is considered that all residual risk can be mitigated through the installation of a suitable clean cover system in any soft landscaping areas. Asbestos has been identified within WS103 (<0.001%), WS107 (<0.001%) and WS112A (0.069%) in the shallow Made Ground deposits. It should be assumed that asbestos fibres are present throughout the Made Ground; therefore, it is recommended that any enabling works resulting in ground disturbance be completed in accordance with an asbestos management plan, with suitable control measures implemented (e.g., appropriate PPE, RPE, and air monitoring). No visual signs of asbestos-containing materials (ACMs) were encountered during the ground investigation. Asbestos is likely to be present within the existing structures. A pre-demolition asbestos survey will be required within all existing buildings within the site boundary.
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Controlled Waters Risk Assessment	Chemical analysis of groundwater and leachate has primarily identified elevated concentrations of heavy metals, with a single instance of elevated fluoranthene in the groundwater sample compared to Environmental Quality Standards (EQS), and a single instance of elevated selenium compared to Drinking Water Standards (DWS). Logwood Mill Brook located at the eastern boundary is considered to be the primary receptor. The identified contaminants are generally of low solubility and mobility, therefore migration towards the brook is considered unlikely. Surface water samples should be obtained from the brook to establish baseline conditions prior to the instigation of remediation works.
Ground Gas Risk Assessment	Although elevated concentrations of methane and carbon dioxide have been recorded, no flow has been observed, therefore the hazardous gas flow rates fall within a CS1 classification. Fundamentally, due to the site being underlain by shallow coal workings, the site should be classified as CS2 as the risk from mining-related gas is high. A post remediation assessment will be required following the completion of the drill and grouting works to confirm the ground gas classification. As part of the detailed design, a Gas Protection Design Report will be required.
Potable Water Infrastructure	Based on the assessment of current site conditions, an allowance for barrier pipe should be made. The pipeline selection will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during the ground investigation.

COAL MINING ASSESSMENT

Coal Mining Assessment	The intrusive ground investigation comprising five, deep, rotary boreholes identified intact shallow coal seams within three of the rotary boreholes, ranging in thickness between 0.60 m to 1.10 m, from depths between 3.00 m bgl to 22.30 m bgl. It is likely that RB102 is positioned at the Tenlands Mine sub-crop, given coal was identified directly beneath the superficial deposits at 3.00-3.60 m bgl. RB105 is positioned to the south of the Tenlands Mine sub-crop and encountered rockhead at 2.30 m bgl and coal at 6.20 m bgl. Coal was not encountered in RB103, located to the east of the mapped fault in the central, eastern sector. In RB104 to the south of the site, evidence of possible coal extraction was identified from 6.40 m bgl to 12.90 m bgl where broken ground followed by a void was encountered. Directly beneath the void, a potential steel structure was noted from 12.80-12.90 m bgl which may indicate an object left in a pillar and stall mine. There is insufficient rock cover above the identified coal seams and evidence of shallow workings has been identified, therefore proof drilling will be required across the proposed building footprint and infrastructure with pressure grouting.
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**Coal Mining
Assessment**
...Continued

Where voids are identified, a secondary (and, if necessary, tertiary) grid will be implemented with subsequent pressure grouting.

The Mining Remediation Authority and Local Planning Authority will require a specification for the consolidation of Abandoned Mine Workings to be prepared to ensure all works are fully designed with suitable verification processes.

GEOTECHNICAL ASSESSMENT

Underground Obstructions & Subterranean Hazards	Significant obstructions will be present beneath the existing warehouse. WS112B was positioned on a raised platform within the warehouse, however it was not possible to penetrate the full depth of the concrete. As part of the process of creating a suitable platform for development, all subterranean obstructions will need to be excavated and removed beneath new structures and infrastructure. This will facilitate the construction of the proposed plots as intended.
Allowable Bearing Capacity	The localised gravelly SAND identified between 1.00–3.00 m bgl is noted to be loose, with an ABC of between 52.18–90.73 kN/m². MUDSTONE and SANDSTONE bedrock at 2.00 m bgl has been identified to be dense, with an ABC of 456.77 kN/m². Soft CLAY was identified at depths of between 1.00–3.00 m bgl in WS102, WS103, WS106, WS107 and WS108, with an ABC in the range of 49.96–80.46 kN/m². Firm CLAY was identified between 1.00–4.00 m bgl, with an ABC of between 82.91–150.26 kN/m². Stiff to very stiff CLAY was recorded at depths of between 2.00 m and 5.00 m bgl, with an ABC of >150 kN/m².
Foundation Options	The suitable target founding stratum has been identified as the underlying stiff to very stiff clays and the mudstone and sandstone bedrock. Prior to the construction of any foundation solution, a programme of remediation and enabling works will be required to remove existing foundation and slab structures and re-engineer the site to provide suitable development platform levels. Upon removal of the relict foundations and infrastructure, it is likely that an engineered foundation solution will be required. The final foundation solution will be dependent on the structural loadings, and elevation and should be designed by a suitably qualified structural engineer with detailed designs from a specialist contractor. Foundation loads associated with pad foundations or piled foundations shall be designed such that the resulting bearing pressure imposed on the stabilised mine workings does not exceed 160 kN/m². The foundation design should consider both dead and imposed loading conditions, together with any local stress concentrations, to ensure that excessive loading is not transferred to the treated strata which could otherwise result in localised instability or unacceptable post-treatment settlement.



Foundation Near Trees	Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.
Heave Precautions Near Trees	The clay soils are classified as Medium Volume Change Potential, and where present at a shallow depth within the conjectured zone of potential tree influence, heave precautions will be required within the construction of a shallow foundation and to the underside of floor slabs.
Building Floor Slabs	A ground bearing slab will be viable, but it will need to be constructed on a granular sub-base with the thickness designed by a structural engineer to ensure that settlement tolerance is taken into consideration.
Soakaway Drainage	Soakaway drainage is unlikely to be suitable for the proposed development, given the presence of Made Ground and low permeability superficial deposits.
Sulphate Assessment	The soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1 in accordance with BRE Special Digest 1 (2005).
Highway & Infrastructure Construction	Where a proposed highway or infrastructure is to be constructed, remediation works will be required to ensure the site is engineered to a suitable geotechnical design specification.
CBR Design %	Granular soils can be re-engineered to ensure 5% within the subgrade during favourable climatic conditions. Natural clay soils will provide a CBR in the order 3-5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to <2%, which will require specialist engineering of the subgrade.
Enabling Earthworks	Development levels are unknown at this time; however, an element of cut/fill work may be required following the removal of underground obstructions. As part of the earthworks design, materials should be assessed and characterised prior to re-use in the construction of upfill to a geotechnical design. All future earthworks should be completed in accordance with a Geotechnical Design Report (GDR) that will consider the ground model within the context of the potential for settlement induced by surcharge from earthworks, dynamic and permanent loading of the development and all known hazards.
Civil Engineering Excavations	The E3P Intrusive Ground Investigation has identified the presence of weathered/competent bedrock at a shallow depth, the presence of which will impede the excavation materials to form sewerage and drainage infrastructure and foundations. Shallow groundwater is present, therefore de-watering of excavations may be required. Trench collapse is considered possible in areas of deep Made Ground and granular deposits, particularly during wet conditions, it is considered that all excavations are supported or battered back in accordance with the guidance contained in CIRIA R97 or through structural engineer design.
Waste Characterisation	Any material that is to be disposed off-site should undergo assessment using Technical Guidance. WM3: <i>Waste Classification – Guidance on the classification and assessment of waste</i> . This can be done upon request and in line with the Environment Agency sampling frequencies.



RECOMMENDATIONS

Based on the findings of the Geoenvironmental site assessment and the various conclusions drawn, the following additional works are recommended to be completed in due course.

- ✳ Further post-demolition ground investigation.
- ✳ Foundations and floor slabs to be designed by a structural engineer.
- ✳ Settlement Analysis for earthworks design.
- ✳ Geotechnical Design Report.
- ✳ Geotechnical Earthworks Specification.
- ✳ Remediation and Enabling Works Strategy.
- ✳ Asbestos Management Plan.
- ✳ Performance Specification for Consolidation of Abandoned Mine Workings.
- ✳ Specification for Mitigation of Hazardous Ground Gases & Verification Plan.
- ✳ Construction phase Surface Water Management Plan.
- ✳ Vibration monitoring and assessment by a specialist consultant will be required if ground engineering works are to be completed in proximity to sensitive structures and infrastructure.



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APPENDIX II – GLOSSARY

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APPENDIX IV – DRAWINGS

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APPENDIX VI – EXPLORATORY HOLE LOGS

APPENDIX VII – CHEMICAL TESTING RESULTS

APPENDIX VIII – GEOTECHNICAL TESTING RESULTS

APPENDIX IX – ORIGIN OF CHEMICAL ASSESSMENT CRITERIA

DRAWING LIST

18-824 - 001 - Site Location Plan
18-824 - 002 - Proposed Development Plan
18-824 - 003 - Historical Features Plan
18-824 - 004 - Site Features Plan
18-824 - 006 - Exploratory Hole Location Plan
18-824 - 007 - Depth of Made Ground Plan
18-824 - 011 - Conceptual Site Model
18-824 - 012 - Depth to Bedrock Plan
18-824 - 014 - Contamination Exceedances Plan
18-824 - 018 - Coal Mining Issues Plan



1. INTRODUCTION

1.1. BACKGROUND

DJL Construction NW Ltd (the client) commissioned E3P to undertake a Phase II Geoenvironmental Site Assessment at Wilson Road, Huyton, Liverpool, L36 6AE.

This report is required to determine potential contaminated land liabilities, remediation requirements and geotechnical engineering works that will be required as a part of the proposed site redevelopment.

1.2. PROPOSED DEVELOPMENT

DJL Construction NW Ltd intends to construct a steel-framed industrial warehouse building with associated access, parking and landscaping. Drawing 18-824-002 (APPENDIX IV) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.1.

Figure 1.1 Proposed Development Layout





1.3. OBJECTIVES

The objectives of the geoenvironmental investigation are as follows:

- ✦ Undertake a phase of sampling and analysis to provide an overview of the environmental issues identified.
- ✦ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site concerning the site's future use and off-site receptors.
- ✦ Assess the geotechnical information and provide recommendations concerning foundations, pavement construction and floor slabs.
- ✦ Assess the coal mining-related information and provide recommendations regarding any future treatment; and
- ✦ Provide recommendations regarding future works required.

1.4. SCOPE OF WORKS

The scope of work includes the elements included in Table 1.1.

Table 1.1 **Scope of Works**

Ground Investigation	✦ Design of suitable ground investigation. ✦ Window sample probeholes with the construction of environmental monitoring installations. ✦ Rotary boreholes ✦ Soil and groundwater sampling
Testing and Monitoring	✦ In-situ geotechnical testing ✦ Chemical and geotechnical analysis ✦ Groundwater monitoring ✦ Ground gas monitoring
Assessment and Reporting	✦ Factual and interpretative reporting ✦ Contamination risk assessment and conceptual site model ✦ Geotechnical assessment and interpretation

1.5. LIMITATIONS

The limitations of this report are presented in APPENDIX I.

1.6. RISK CLASSIFICATION

The description of risk classification and the likely action required as set out in CIRIA C552 are included in APPENDIX III.



1.7. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed or with whom an assignment has been agreed. Should any third party wish to use or rely upon the report's contents, written approval must be sought from E3P; a charge may be levied against such consent.



2. E3P GROUND INVESTIGATION

2.1. GENERAL OVERVIEW

A ground investigation has been designed based on the findings of the E3P desk study (ref: 18-824-R1-1, dated May 2026), with exploratory holes advanced to target specific potential contaminant sources and features as identified in the initial CSM. The potential on-site sources of contamination are summarised as follows:

- ✳ Historical Tanks
- ✳ Logwood Corn Mill
- ✳ Canning Factory
- ✳ Vehicle/Equipment Storage (leaks/ spillages)
- ✳ Made Ground is associated with historical construction and demolition activities
- ✳ Potential ACMs within the existing warehouse
- ✳ Electrical Substation
- ✳ Shallow coal workings

The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed between 16th March 2026 and 20th March 2026. The works are summarised in Table 2.1.

2.2. LIMITATIONS

Given the active nature of the site, exploratory hole locations could not be completed within the majority of the warehouse. Further post demolition investigation will be required. WS112B was positioned on a raised platform within the warehouse, however it was not possible to penetrate the full depth of the concrete.

2.3. SCOPE OF INVESTIGATION

A summary of the fieldwork completed is included in Table 2.1.

Table 2.1 Summary of Fieldwork

POTENTIAL SOURCE / RAIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
Former Factory/Works	WS101	Window Sample Probehole	3.42	1.00 – 3.00
Former Building	WS102		5.12	N/A
General Ground Conditions	WS103		3.43	1.00 – 3.00
	WS104		3.42	0.50 – 1.50
	WS105		5.01	2.00 – 4.00



POTENTIAL SOURCE / RAIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions	WS106	Window Sample Probehole	3.40	1.00 – 2.00
	WS107		4.44	2.00 – 3.00
Former Brook	WS108		5.45	N/A
Former Buildings	WS109		3.40	1.00 – 3.00
	WS110		2.21	1.00 – 2.00
General Ground Conditions	WS111		2.36	1.00 – 2.00
Former Farm Buildings	WS112A		3.15	N/A
Existing Warehouse (Raised Platform)	WS112B		0.40	
Investigation of Potential Shallow Mine Workings	RB101	Rotary Borehole	40.00	N/A
	RB102		40.00	
	RB103		40.00	
	RB104		40.00	
	RB105		40.00	

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples and install groundwater and ground gas monitoring wells.

The series of rotary boreholes were advanced to investigate the potential presence of shallow mine workings. These boreholes were drilled in accordance with the MRA permissions process and industry best practices.

The sampling locations are illustrated in Drawing 18-824-006 (APPENDIX IV). The ground conditions encountered are indicated on the logs, which are provided in APPENDIX VII.

The locations were surveyed by GPS to Ordnance Datum with an accuracy of <10mm.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, selected wells were purged and samples of groundwater recovered for chemical analysis.

2.4. INSITU STANDARD PENETRATION TEST (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60-degree cone (SPT(C)) was used instead of the sampling tube. The results are shown in the borehole logs in APPENDIX VI, presented in Table 6.2 and discussed in Section 6.0.



2.5. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical geotechnical analysis, summarised in Table 2.2.

Table 2.2 Summary of Laboratory Analysis

CHEMICAL ANALYSIS	
✳	Metals
✳	pH, total sulphate, water-soluble sulphate (2:1 extract)
✳	Sulphide
✳	Cyanide
✳	Phenols
✳	Speciated polycyclic aromatic hydrocarbons (PAHs)
✳	Asbestos identification and quantification
✳	Banded total petroleum hydrocarbons (TPHs)
✳	Total Organic Carbon (TOC)
GEOTECHNICAL ANALYSIS	
✳	Atterberg limits determinations
✳	Moisture content
✳	Single stage triaxial tests
✳	Oedometer tests

2.6. STORAGE, PRESERVATION AND TRANSPORT OF SAMPLES

Measures taken to ensure the quality and integrity of the collected samples, from collection to receipt of the samples by the laboratory, are summarised in Table 2.3.

Table 2.3 Sample Integrity Information

SUBJECT	CHEMICAL SAMPLING	
Storage	Soil Glass jars supplied by the laboratory were used for the collection of soil samples to be analysed for VOCs. Plastic tubs were used to collect soil samples for metals analysis and asbestos screening. Glass vials supplied by the laboratory were used for the collection of samples to be analysed for VOCs. Samples to be analysed for lower volatility compounds were stored in laboratory-prepared glass jars.	Groundwater Glass vials supplied by the laboratory were used for the collection of samples to be analysed for VOCs. Samples to be analysed for lower volatility compounds were stored in laboratory-prepared glass jars.
Preservation	Soil and groundwater sample containers were filled to minimise headspace prior to sealing and stored at a low temperature within cool boxes with cooling aids to minimise the loss of volatile contaminants and reduce microbial activity during the collection of samples.	



SUBJECT	CHEMICAL SAMPLING	
Sample Integrity	Dedicated disposable nitrile gloves were worn and changed between sample collections to prevent cross-contamination.	Groundwater samples were collected using dedicated plastic tubing, which was changed between monitoring well locations to prevent cross-contamination.
Transport	Samples were stored and shipped in dedicated sample boxes provided by the laboratory. Sample details were recorded on the laboratory chain of custody form enclosed with the samples prior to dispatch. Scheduling information for the samples was confirmed with the laboratory via email.	

Chemical analysis has been undertaken by an accredited laboratory with the testing results summarised and discussed in Section 4.0 and the testing certificates included in APPENDIX VII.

Geotechnical samples were collected as required per location immediately after excavation, labelled and sealed to minimise moisture loss. The geotechnical samples were collected and couriered by a dedicated courier to an accredited geotechnical testing laboratory. The testing results are summarised and discussed in Section 6.0 and the testing certificates included in APPENDIX VIII.



3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation generally confirms the published geology and identifies the strata set out in Table 3.1.

Table 3.1 Summary of Strata

HOLE	MADE GROUND	REWORKED TOPSOIL	CONCRETE	SANDY CLAY	SLIGHTLY SANDY GRAVELLY CLAY	SLIGHTLY CLAYEY SLIGHTLY GRAVELLY SAND	NO RECOVERY	BEDROCK	COAL	VOID/ BROKEN GROUND
WS101	0.35 – 1.00	–	0.00 – 0.35	1.00 – 3.42	–	–	–	–	–	–
WS102	0.00 – 0.70	–	–	4.00 – 5.12	1.30 – 3.00 3.40 – 3.70	0.70 – 1.30	3.00 – 3.40 3.70 – 4.00	–	–	–
WS103	0.00 – 1.00	–	–	1.60 – 3.43	1.00 – 1.60	–	–	–	–	–
WS104	0.20 – 1.80	0.00 – 0.20	–	2.40 – 3.42	1.80 – 2.40	–	–	–	–	–
WS105	0.00 – 1.30	–	–	4.00 – 5.01	1.30 – 3.00	3.30 – 4.00	3.00 – 3.20	–	–	–
WS106	0.10 – 2.00	0.00 – 0.10	–	–	2.00 – 3.40	–	–	–	–	–
WS107	0.60 – 1.00 1.40 – 2.00	0.00 – 0.60	–	2.00 – 4.00 4.00 – 4.44	–	–	1.00 – 1.40	–	–	–
WS108	0.00 – 2.00	–	–	3.90 – 5.45	2.00 – 3.90	–	–	–	–	–
WS109	0.00 – 1.00	–	–	–	1.00 – 1.60 1.80 – 3.40	–	–	–	1.60 – 1.80	–
WS110	0.00 – 0.80	–	–	0.80 – 1.00	1.30 – 1.90	1.00 – 1.30	–	1.90 – 2.21	–	–
WS111	0.00 – 0.80	–	–	0.80 – 1.70	–	–	–	1.70 – 2.36	–	–
WS112A	0.25 – 0.70	–	0.00 – 0.25	–	1.00 – 3.15	0.70 – 1.00	–	–	–	–
WS112B	–	–	0.00 – 0.40*	–	–	–	–	–	–	–
RB101	0.00 – 1.70	–	–	–	1.70 – 3.10	–	–	3.10 – 3.80 4.90 – 40.00	3.80 – 4.90	–



HOLE	MADE GROUND	REWORKED TOPSOIL	CONCRETE	SANDY CLAY	SLIGHTLY SANDY GRAVELLY CLAY	SLIGHTLY CLAYEY SLIGHTLY GRAVELLY SAND	NO RECOVERY	BEDROCK	COAL	VOID/ BROKEN GROUND
RB102	0.20 – 1.60	–	0.00 – 0.20	–	1.60 – 3.00	–	–	3.60 – 14.30 15.30 – 40.00	3.00 – 3.60 14.30 – 15.30	–
RB103	0.00 – 5.40	–	–	–	–	–	–	5.40 – 40.00	–	–
RB104	0.00 – 0.80 12.80 – 12.90	–	–	–	0.80 – 2.30	–	–	2.30 – 6.40 12.80 – 40.00	–	6.40 – 12.80
RB105	0.25 – 0.50	–	0.00 – 0.25	–	0.50 – 2.30	–	–	2.30 – 6.20 7.00 – 7.60 8.50 – 10.60 10.60 – 15.10 15.70 – 21.40 22.30 – 40.00	6.20 – 7.00 7.60 – 8.50 15.10 – 15.70 21.40 – 22.30	–

*Base of Made Ground Not Encountered



3.2. MADE GROUND

Made Ground was encountered in all exploratory hole locations to a maximum proven depth of 5.40 m bgl (RB103). However, Made Ground was generally present to a depth of less than 2.00 m bgl.

Typically, the Made Ground comprises greyish brown sandy gravel of mudstone, sandstone and limestone from ground level. In the majority of locations, this is underlain by dark brown slightly sandy gravelly clay extending to a proven depth of 2.00 m bgl (WS106, WS107, WS108).

Reworked topsoil, comprising sandy gravel or gravelly sand, was recorded at three locations (WS104, WS106, WS108).

Concrete was encountered at four locations (WS101, WS112A, RB102, RB105) from ground level to a maximum depth of 0.35 m bgl (WS101). WS112B was positioned on a raised platform within the warehouse and encountered concrete to a depth in excess of 0.40 m bgl, it was not possible to penetrate the full depth of the concrete.

In RB103, a blackish brown sandy gravel of mudstone, sandstone, coal, brick and limestone was recorded between depths of 0.20 m and 5.40 m bgl.

A Depth of Made Ground Plan is presented as Drawing 18-824-007 in APPENDIX IV.

3.3. SUPERFICIAL GEOLOGY

Natural superficial deposits were identified within all exploratory hole locations at a depth of between 0.80 – 5.45 m bgl (WS108), with the exception of RB103 where the Made Ground deposits were directly underlain by bedrock.

The natural deposits primarily consisted of either sandy CLAY or sandy gravelly CLAY, proven from depths of between 0.80–5.45 m bgl. Cohesive deposits generally ranged in consistency and strength, varying from firm low strength to very stiff high strength.

A band of COAL was encountered within the cohesive deposits in WS109 at 1.60 – 1.80 m bgl.

Brown gravelly fine to coarse SAND was identified within four exploratory locations, locally interbedded within the cohesive deposits between 0.30–4.00 m bgl. Where deposits were identified, the stratum was noted at a thickness of between 0.30–0.70 m and the soils were recorded to be loose.

3.4. BEDROCK GEOLOGY

Bedrock was identified within all of the rotary boreholes and two of the window sample boreholes at depths of between 1.70 – 40.00 m bgl. Rockhead was encountered at depths of between 1.70 m and 3.10 m bgl.

The bedrock generally comprises red/grey SANDSTONE, or grey MUDSTONE with the presence of MUDSTONE, SANDSTONE and SILTSTONE bands or coal traces.

Coal seams were identified within RB101 between 3.80 – 4.90 m bgl, RB102 between 3.00 – 3.60 m bgl, and multiple seams within RB105 between 6.20 – 7.00 m bgl, 7.60 – 8.50 m bgl, 15.10 – 15.70 m bgl, and 21.40 – 22.30 m bgl.



3.5. GROUNDWATER

Water strikes were only recorded within three of the exploratory hole locations. The depth of the water strikes are shown on the exploratory hole records in APPENDIX VI and are summarised in Table 3.2.

Table 3.2 Summary of Groundwater Strikes

LOCATION	DEPTH TO STRIKE (m)	OBSERVATIONS
WS102	2.00	Slow ingress in CLAY
WS105	2.00	Slow ingress in CLAY
WS107	2.50	Slow ingress in CLAY

Monitoring was undertaken using an electronic dip meter and interface probe to record the depth to groundwater and the thickness of any free-phase hydrocarbon product.

3.6. GEOLOGICAL CROSS-SECTION

Geological cross-section is included in APPENDIX IV, and snapshots are shown in Figure 3.1 and Figure 3.2.

Figure 3.1 Geological Cross Section (North-South)

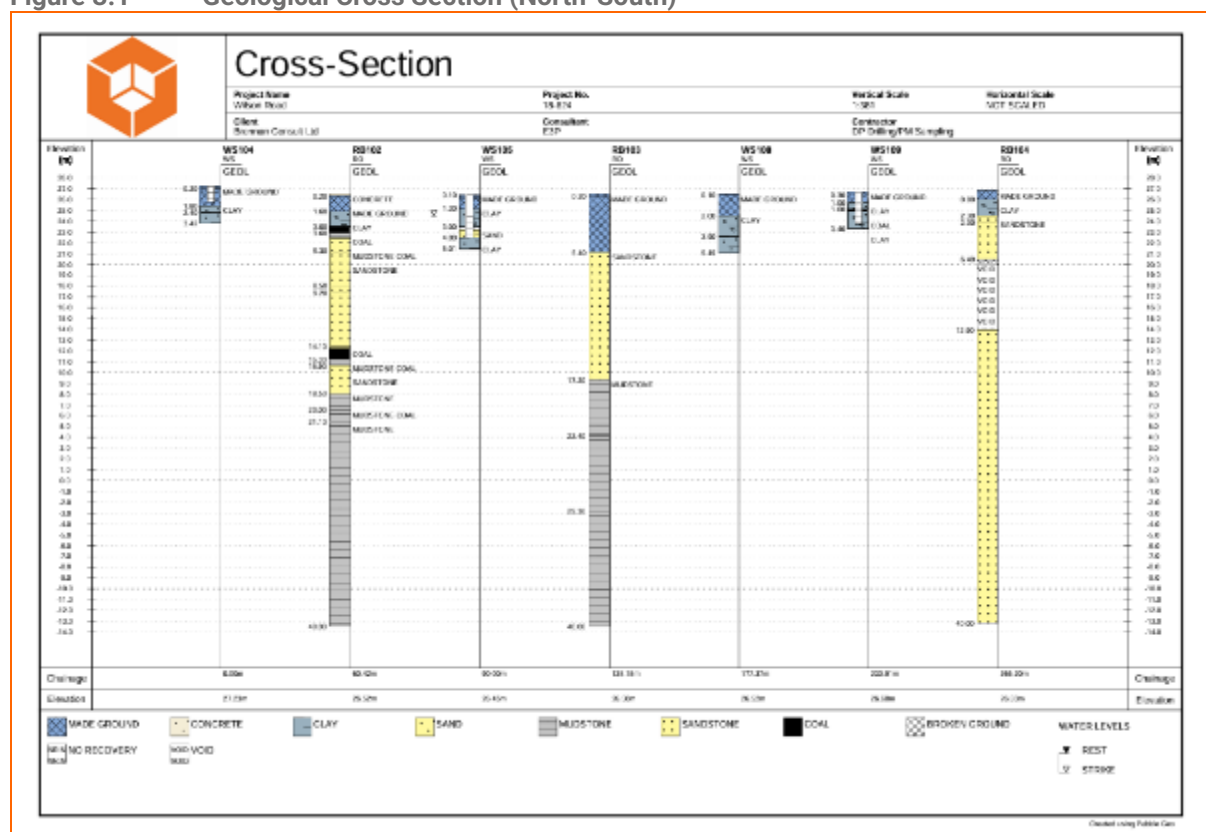
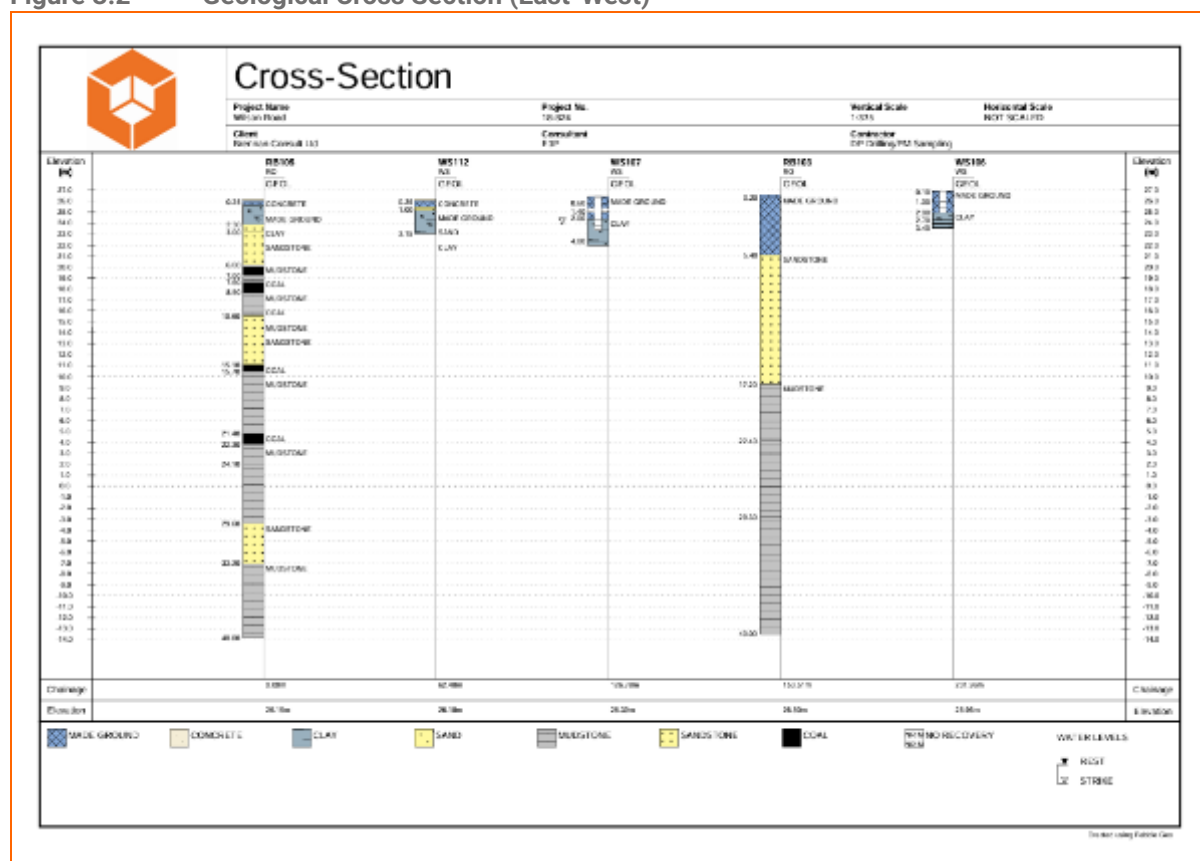




Figure 3.2 Geological Cross Section (East-West)



3.7. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has not been identified during the site investigation.

3.8. OBSTRUCTIONS

Identified obstructions are summarised in Table 3.3.

Table 3.3 Summary of Obstructions

LOCATION	DEPTH (m)	STRATUM	OBSERVATIONS
WS112B	0.40	Made Ground (Concrete)	Unable to penetrate concrete within raised platform.
RB104	12.80 – 12.90	Broken Ground / Void	Possible steel left in a pillar and stall mine at 12.80-12.90 m bgl.



4. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative land risk assessment with respect to human health, controlled waters and ground gas to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

4.1. DEVIATING SAMPLES

Best practice sampling procedures including the use of appropriate sampling containers and adhering to the laboratory holding times for each contaminant analysis, were undertaken in order to avoid samples being deviating.

A deviation was noted for sample WS101 at 0.80 m, relating to the use of an incorrect container/insufficient material provided.

Deviations were also noted for the groundwater sample from WS101, relating to the holding time for BTEX, dissolved organic carbon, hexavalent chromium, metals, TPH, total cyanide and pH.

The deviations are not considered to affect the overall conclusions.

4.2. SAMPLE ANALYSIS POPULATION

Table 4.1 summarises the chemical analysis testing scheduled.

Table 4.1 Summary of Testing Schedule

TYPE OF SAMPLE	NUMBER OF SAMPLES	DETERMINANDS
Made Ground	8	Heavy Metals, PAHs, Banded TPH, Asbestos ID, Sulphates, Total Cyanide, Total Phenols, pH, Total Organic Carbon
	3	Asbestos Quantification
	3	Leachate analysis
CLAY	3	Heavy Metals, PAHs, Banded TPH, Sulphates, Total Cyanide, Total Phenols, pH, Total Organic Carbon
Groundwater	1	Heavy Metals, PAHs, Speciated TPH, Total Cyanide, Total Phenols, pH, Dissolved Organic Carbon, VOCs, SVOCs

4.3. HUMAN HEALTH RISK ASSESSMENT

At Tier 2 stage, the long-term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

Where Tier 2 screening values are not provided by LQM, other screening values have been used as referenced.



The Tier 2 screening values for a commercial end use have been utilised for this assessment due to the proposed commercial development. To remain conservative at an early stage, the screening values based on a 1% SOM have been utilised for this assessment.

The results of the comparison have been summarised in Table 4.2.

Table 4.2 Summary of Inorganic and Hydrocarbon Toxicity Assessment for a Commercial End Use

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
Arsenic	mg/kg	640	11	15.0	–	1	No Further Action
Cadmium	mg/kg	190	11	1.20	–	1	No Further Action
Chromium (VI)	mg/kg	33	11	<1.80	–	1	No Further Action
Lead	mg/kg	2300**	11	200	–	1	No Further Action
Mercury	mg/kg	58	11	<0.30	–	4	No Further Action
Nickel	mg/kg	980	11	32.0	–	1	No Further Action
Selenium	mg/kg	12000	11	1.80	–	1	No Further Action
Copper	mg/kg	68000	11	52.0	–	1	No Further Action
Zinc	mg/kg	730000	11	470	–	1	No Further Action
Cyanide – Total	mg/kg	791	11	<1.00	–	1	No Further Action
Phenols – Total	mg/kg	440	11	<1.00	–	1	No Further Action
Asbestos	Fibres	NFD	8	<0.001 <0.001 0.069	WS103 - 0.10m WS107 - 0.50m WS112A - 0.30m	3	Further Action Required
Naphthalene	mg/kg	190	11	<0.05	–	4	No Further Action
Acenaphthylene	mg/kg	83000	11	0.10	–	2	No Further Action
Acenaphthene	mg/kg	84000	11	0.68	–	1	No Further Action
Fluorene	mg/kg	63000	11	0.56	–	1	No Further Action
Phenanthrene	mg/kg	22000	11	3.30	–	2	No Further Action
Pyrene	mg/kg	520000	11	6.90	–	2	No Further Action
Benzo(a) Anthracene	mg/kg	23000	11	3.50	–	2	No Further Action
Chrysene	mg/kg	54000	11	3.20	–	2	No Further Action
Benzo(b) Fluoranthene	mg/kg	170	11	3.70	–	2	No Further Action
Benzo(k) Fluoranthene	mg/kg	350	11	1.00	–	2	No Further Action
Benzo(a) Pyrene	mg/kg	44	11	4.00	–	2	No Further Action
Indeno (123-cd) Pyrene	mg/kg	1200	11	1.50	–	2	No Further Action
Dibenzo (a,h) Anthracene	mg/kg	35	11	0.50	–	2	No Further Action
Benzo(ghi) Perylene	mg/kg	500	11	2.1	–	2	No Further Action
TPH C5-C6 (aliphatic)*	mg/kg	3200	11	<0.1	–	4	No Further Action
TPH C6-C8 (aliphatic)*	mg/kg	7800	11	<0.01	–	4	No Further Action
TPH C8-C10 (aliphatic)*	mg/kg	3200	11	<0.02	–	4	No Further Action
TPH C10-C12 (aromatic)*	mg/kg	7800	11	<2.0	–	4	No Further Action
TPH C12-C16(aromatic)*	mg/kg	2000	11	4.5	–	4	No Further Action
TPH C16-21 (aromatic)*	mg/kg	16000	11	33	–	1	No Further Action
TPH C21-35 (aromatic)*	mg/kg	36000	11	660	–	1	No Further Action



Notes

PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas inhalation

Abbreviations: GAC = general assessment criteria, N = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; PL = Contaminant pathway of that contaminant.

*The Tier 2 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 2 values for aliphatic compounds for the volatile and semi volatile fractions (C5-C12) and the Tier 2 values for aromatic compound for the non-volatile fractions (C12-C35). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

**The Tier 2 GAC for lead has been taken from CL:AIRE C4SL.

Referring to Table 4.2, the results of this direct comparison indicates that the data exceeds the screening criteria for a commercial end use for the following contaminant:

- ☛ Asbestos (Amosite and Chrysotile) - <0.001 to 0.069%

No further exceedances were identified.

4.3.1. EXPOSURE PATHWAYS

The main exposure pathway based on the Tier 2 exceedance is:

- ☛ Fibre/dust inhalation (PL3).

4.3.2. HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

Asbestos in the form of loose amosite fibres has been identified in the granular Made Ground within WS103 at a concentration of <0.001% wt/wt (trace fibres). Asbestos in the form of chrysotile has also been identified within WS107 at <0.001% wt/wt (trace fibres) and within WS112A at a concentration of 0.069% wt/wt in the shallow Made Ground deposits.

Impacted soils should be managed in accordance with the asbestos risk mitigation conceptual site model presented in Figure 4.1. It should be assumed that asbestos fibres are present throughout the Made Ground, therefore it is recommended that any enabling works resulting in ground disturbance be completed in accordance with an asbestos management plan with suitable control measures implemented (e.g. appropriate PPE, RPE and air monitoring).

No visual signs of asbestos-containing materials (ACMs) were encountered during the ground investigation. Asbestos is likely to be present within the existing structures. A pre-demolition asbestos survey will be required within all existing buildings within the site boundary.



Figure 4.1 Asbestos Risk Mitigation Conceptual Site Model



Notes

- **ND None Direct**
- **0.001% Soils may contain <0.001% asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression) 0.1% Soils at a depth of > 1.00m bgl may contain <0.1% asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.**
- **Undefined – this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.**

Chemical analysis of the natural clay superficial deposits has identified these soils to be acceptable for use as subsoil within any proposed landscaped areas; however, further chemical validation samples may be required to meet the regulatory sampling frequency.



4.4. CONTROLLED WATERS SENSITIVITY

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 4.3.

Table 4.3 Controlled Waters Conceptual Model and Sensitivity Profile

DISCUSSION		SENSITIVITY RATING
Contaminant Source		
Made Ground Soil analysis has not identified any elevated concentrations of heavy metals, PAHs, and TPHs which would potentially pose a risk to identified controlled waters receptors. No visual or olfactory evidence of contamination was identified during the ground investigation.		Low
Former Mill/Factory/Works, Historical Tanks, Vehicle/Equipment Storage Based on the site's former use as a mill and factory, there is the potential for mobile contaminants (TPH, S/VOCs) to be present within the Made Ground and shallow groundwater. Fuel spillages and leaks associated with former tanks and vehicle/equipment storage across the site may also present a potential source of TPHs, volatile PAHs, S/VOCs. The risk is reduced due to the presence of hardstanding across large areas of the site.		Low to Moderate
Pathway		
Vertical Migration The majority of the site has been found to be underlain by cohesive superficial geology directly beneath the Made Ground deposits. Overall, cohesive geology is less permeable than granular geology, therefore reducing the likelihood of vertical migration from the overlaying Made Ground into the underlying aquifer. However, where Made Ground directly overlies the bedrock, the risk of vertical migration of compounds is significantly increased.		Low to Moderate
Lateral Migration Lateral migration of contaminants is considered possible due to the presence of granular Made Ground deposits across the site.		Moderate
Receptors		
Aquifer Classification in Superficial Drift Deposits	Secondary Undifferentiated aquifer	Low
Aquifer Classification in Bedrock	Secondary A Aquifer	Moderate
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not affected.	Low
Distance to the closest Groundwater Abstraction Point	None identified within a 1km radius.	Low
Is the Site Located Within 50 m of a Surface Watercourse?	Prescot Brook (Logwood Mill Brook) runs along the eastern site boundary.	High

The ICSM developed within the context of the site setting has identified a viable pollutant pathway, which would be the lateral migration of potentially mobile phase-soluble contaminants towards the adjacent Brook.



4.5. CONTROLLED WATERS RISK ASSESSMENT

The Tier 2 assessment in line with LCRM (2025) has included a comparison of leachate analysis from samples of the Made Ground and a groundwater sample to drinking water standards (DWS) and environmental quality standards (EQS).

EQS will be viewed as a priority given the pollutant linkage is with the nearby surface watercourse, however where there are no regulatory guidance values for EQS, the DWS will be utilised in their absence.

The water sample was obtained utilising a bailer. The results of chemical analysis are presented in Table 4.4.



Table 4.4 Comparison of Groundwater and Leachate Analysis with Tier 2 Screening Levels

DETERMINAND	UNIT	EQS AA 1,2	DWS 2, 3,4	NO OF GW SAMPLES	MAX CONC IN GROUNDWATER SAMPLES	LOCATION OF EXCEEDANCE	NO OF LEACHATE SAMPLES	MAX CONC IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
Arsenic	µg/l	50	10	1	2.0	–	3	2.9	–	No Further Assessment
Cadmium	µg/l	0.08- 0.25	5	1	0.05	–	3	<0.08	–	
Chromium (VI)	µg/l	3.4	–	1	<5.0	–	3	<5.0	–	
Chromium (III)	µg/l	4.7	50	1	0.30	–	3	3.1	–	
Copper	µg/l	1	2000	1	7.6	WS101	3	14 9.9 3.9	WS103 (0.10) WS109 (0.10) WS106 (1.20)	Further Assessment Required
Total Cyanide	µg/l	1	50	1	<1.0	–	3	8.9	WS106 (1.20)	Further Assessment Required
Lead	µg/l	1.2	10	1	2.7	WS101	3	7.7 5.9 2.2	WS109 (0.10) WS103 (0.10) WS106 (1.20)	Further Assessment Required
Mercury	µg/l	–	1.0	1	<0.05	–	3	<0.5	–	No Further Assessment
Nickel	µg/l	4	20	1	9.3	WS101	3	1.8	–	Further Assessment Required
Selenium	µg/l	–	10	1	17	WS101	3	<4.0	–	
Zinc	µg/l	10.9	3000 ⁶	1	6.6	–	3	15 12	WS106 (1.20) WS103 (0.10)	
pH	6–9			1	7.7	–	3	10.4	WS103 (0.10)	
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	–	1	<0.01	–	3	<0.01	–	No Further Assessment
Anthracene	µg/l	0.1	–	1	0.02	–	3	<0.01	–	
Benzo(a) Pyrene	µg/l	0.00017*	0.01	1	<0.01	–	3	<0.01	–	
Benzo (b) Fluoranthene	µg/l	0.00017*	0.1	1	<0.01	–	3	<0.01	–	
Benzo (k) Fluoranthene	µg/l	0.00017*		1	<0.01	–	3	<0.01	–	
Indeno(123-cd)pyrene	µg/l	0.00017*		1	<0.01	–	3	<0.01	–	
Benzo(ghi)Perylene	µg/l	0.00017*		1	<0.01	–	3	<0.01	–	
Fluoranthene	µg/l	0.0063	–	1	0.05	WS101	3	<0.01	–	Further Assessment Required

Aromatic Hydrocarbon



DETERMINAND	UNIT	EQS AA 1,2	DWS 2, 3,4	NO OF GW SAMPLES	MAX CONC IN GROUNDWATER SAMPLES	LOCATION OF EXCEEDANCE	NO OF LEACHATE SAMPLES	MAX CONC IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
TPH C5-C7 (Benzene)	µg/l	10	1	1	<1.0	–	3	<1.0	–	No Further Assessment
TPH C7-C8 (Toluene)	µg/l	74	700	1	<1.0	–	3	<1.0	–	
TPH C8-C10 (Xylene)	µg/l	30	300	1	<1.0	–	3	<1.0	–	
TPH C10-C12 (Naphthalene)	µg/l	2	90	1	<10	–	3	<10	–	
TPH C12-C16	µg/l	-	90	1	<10	–	3	<10	–	
TPH C16-C35	µg/l	-	90	1	<10	–	3	<10	–	
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000 ⁵	1	<1.0	–	3	<1.0	–	No Further Assessment
TPH C6-C8	µg/l	–	1000 ⁵	1	<1.0	–	3	<1.0	–	
TPH C8-C10	µg/l	–	300	1	<1.0	–	3	<1.0	–	
TPH C10-C12	µg/l	–	300	1	21	–	3	<10	–	
TPH C12-C16	µg/l	–	300	1	45	–	3	<10	–	
TPH C16-C21	µg/l	–	300 ^{**}	1	15	–	3	<10	–	
TPH C21-C35	µg/l	–	300 ^{**}	1	62	–	3	<10	–	
Volatile Organic Compounds										
MTBE (Methyl Tertiary Butyl Ether)	µg/l	–	–	1	<3.0	–	3	<3.0	–	No Further Assessment
Benzene	µg/l	10	–	1	<1.0	–	3	<1.0	–	
Toluene	µg/l	74	700	1	<1.0	–	3	<1.0	–	
Ethylbenzene	µg/l	–	300	1	<1.0	–	3	<1.0	–	
p & m-xylene	µg/l	30	500	1	<1.0	–	3	<1.0	–	
o-xylene	µg/l	30	50	1	<1.0	–	3	<1.0	–	

#Solubility <0.01µg/l

AA – Annual Average

*Polyaromatic hydrocarbons (PAH) – Benzo(a)pyrene (BaP), Benzo(b)fluoranthene,

Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water.

**There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 (legislation.gov.uk)
2. The Water Supply (Water Quality) Regulation 2018 (legislation.gov.uk)



3. *Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum (who.int)*
4. *CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance (claire.co.uk)*
5. *A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.*
6. *Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996*



This comparison indicates that the data exceeds the EQS and DWS values for the following inorganic compounds:

Table 4.5 Summary of Controlled Waters Risk Assessment

EXCEEDANCE (GROUNDWATER)	OF	EQS	EXCEEDANCE (LEACHATE)	OF	EQS	EXCEEDANCE OF DWS (GROUNDWATER)
☛ Copper			☛ Copper			☛ Selenium
☛ Lead			☛ Cyanide			
☛ Nickel			☛ Lead			
☛ Fluoranthene			☛ Zinc			
			☛ pH			

It should be noted that leaching tests were undertaken alongside groundwater testing. The leachate test is aggressive (de-ionised water) and is not in aqueous equilibrium (steady state) within the solid sample. This may cause rapid dissolution and overestimation of the aqueous phase concentrations compared to groundwater in contact with contaminated soils. Although dissolution may be reduced for highly hydrophobic contaminants, such as B(a)P it is likely that the initial leaching will remove the most readily available hydrocarbons and subsequent flushing would reduce the leachable concentrations.

4.5.1. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

The site was historically used as a farm, with a Corn Mill in the central sector. A Canning Factory/Works was also located in the northwest of the site and a number of tanks were noted on historical mapping. More recently the site has been used to store vehicles. This increases the risk of mobile contaminants within the underlying Made Ground, however the risk is reduced in areas of hardstanding. The intrusive investigation has identified site wide Made Ground, however no instances of visual or olfactory evidence of contamination within the deposits were noted.

Chemical soil analysis has not identified any significantly elevated concentrations of heavy metals, PAHs or TPHs which could potentially pose a risk to the identified controlled water receptors. However, further investigation will be required beneath the existing building to confirm the absence of any significant impact.

Given the site is predominantly underlain by cohesive deposits beneath the Made Ground, the lateral and vertical migration of compounds potentially contained within the deposits is substantially limited. Where granular superficial geology was recorded, there is an increased risk of vertical and lateral migration to the identified controlled water receptors. Additional risk is posed to the underlying aquifer in areas where shallow bedrock geology has been identified (<5.00m bgl), as cohesive deposits are not present in significant quantities required to provide a natural aquitard protecting the underlying aquifer. There are no groundwater/potable abstractions within 1km, therefore the sensitivity of the aquifer is reduced.

Chemical analysis of groundwater and leachate analysis has primarily identified elevated concentrations of heavy metals, with a singular instance of elevated fluoranthene in the groundwater sample when compared to Environmental Quality Standards (EQS), and a single instance of elevated selenium when compared to Drinking Water Standards (DWS).

Logwood Mill Brook located at the eastern boundary is considered to be the primary receptor. The identified contaminants are generally of low solubility and mobility, therefore migration towards the brook is considered unlikely.

The proposed end use of the site attains to a commercial unit, the majority of the surrounding areas of the main structure will be covered by hardstanding. The implementation of hardstanding will help to



reduce the amount of infiltration generated. This will in turn reduce the amount of contaminants present in leachate off the site and reduce the risk further to the underlying aquifer and adjacent brook.

Surface water samples should be obtained from the brook to establish baseline conditions prior to the instigation of remediation works.

4.6. GROUND GAS RISK ASSESSMENT

4.6.1. RATIONALE

Hazardous ground gas qualitative risk assessment is based on a conceptual site model (CSM) similar to that used for soil and groundwater contamination sources (i.e., source pathway receptor pollutant linkages).

The risk can be assessed based on knowledge of the ground conditions and CSM and a measure of hazardous gas concentrations and gas flow at the site within monitoring standpipes.

4.6.1. SOURCES AND PATHWAYS OF GROUND GAS

Table 4.6 summarises the potential sources and pathways of ground gas within the context of the recorded site setting and proposed development.

Table 4.6 Identified Potential Sources of Ground Gas

SOURCE
Made Ground Made Ground was encountered in all exploratory hole locations to a maximum proven depth of 5.40 m bgl; typically comprising sandy gravel to depths of approximately 1.70 m bgl which is commonly in turn underlain by dark brown slightly sandy gravelly clay extending to a proven depth of 2.00 m bgl. Where Made Ground has been proven in excess of 2.00 m bgl the likelihood of hazardous ground gas elevation is marginally increased. However, no evidence of visual or olfactory evidence of contamination has been identified within any of the Made Ground deposits which could potentially generate ground gases or volatile vapours.
Superficial Strata Natural superficial deposits were identified within all exploratory hole locations at depths of between 0.80 m and 5.45 m bgl (WS108), with the exception of RB103 where the Made Ground deposits were directly underlain by bedrock. The natural deposits primarily consisted of either sandy CLAY or sandy gravelly CLAY with occasional instances of interbedded gravelly fine to coarse SAND identified between 0.70 – 4.00 m bgl. No gassing sources have been identified in the superficial deposits.
Bedrock Strata Bedrock was identified within all of the rotary boreholes and two of the window sample boreholes at a depth of between 1.70 – 40.00 m bgl. The bedrock present generally consisted of interbedded SANDSTONE, MUDSTONE and SILTSTONE. Intact coal seams have been identified between 3.00–22.30 m bgl. The site is located within a development high risk area. Geological mapping records the Tenlands Mine (Ravenhead Main Delf) sub-crop in the west of the site. The Bastions Mine sub-crops to the north of the site. The strata is shown to dip to the south, beneath the subject site. Nearby workings are recorded between 110-290 m bgl. In addition, the ground investigation has found evidence of shallow workings within RB104 in the south of the site. Unflooded abandoned mine workings generate carbon dioxide (CO ₂) through various geological and chemical processes. The oxidation of pyrite (iron sulfide) in the presence of oxygen and water produces sulfuric acid, which reacts with carbonate minerals like limestone, releasing CO ₂ .



Additionally, aerobic decomposition of organic material in the mine, such as coal, produces CO₂ as a byproduct. CO₂ can also desorb from coal seams due to pressure changes. Geological factors, including fractures and permeability of surrounding rock, influence the migration and accumulation of CO₂, which poses a potential risk for gas ingress into overlying structures.

Any methane (thermogenic gas) originally trapped in coal seams or organic material would have likely been released during mining operations or shortly after abandonment due to pressure changes, leaving little potential for ongoing methane production. Therefore, any detected methane is isolated pockets with the mine workings not considered a source of generating a persistent CH₄ source.

Unflooded mine workings are generally not capable of generating a persistent source of methane because the conditions necessary for methane production—such as anaerobic (oxygen-free) environments—are absent. Methane is typically produced through the anaerobic decomposition of organic material, which requires waterlogged, oxygen-depleted conditions. In unflooded and well-ventilated mines, oxygen is present, which supports aerobic rather than anaerobic processes. This prevents the methane-generating bacteria (methanogens) from thriving.

Landfill Sites

No active landfill sites have been identified within 250 m of the site boundary. However, there is one historical landfill EA/NRW records 88 m NW of the site at Brickfields, Knowsley, Merseyside for inert waste.

Other Gases

The BGS reports that no radon protective measures are necessary in the construction of new dwellings or extensions.

4.6.2. MONITORING FREQUENCY

The CIRIA C665 guidance on gas risk assessment includes recommendations for periods frequencies for monitoring visits. These recommendations take into account the nature of the proposed development and the likely generation potential of the source.

The proposed development comprises an industrial warehouse, which would be classified as a Type D development (low sensitivity) in accordance with BS8485:2015+A1:2019. It is considered that the likely generation potential of the identified gas sources (taking into account the likelihood of future increases in gas generation) would be best classified as moderate.

Therefore, within the context of the proposed commercial end-use and ground gas generation potential, the gas assessment requires six visits over three months, with at least two sets of readings at low or falling atmospheric pressure.

4.6.3. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in:

- ✳ CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007).
- ✳ BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
- ✳ CL:AIRE Publication “Good Practice for Risk Assessment for Coal Mine Gas Emissions” (October 2021)



BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

Where:

q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe.

C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A 'worst case check' may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole with the maximum concentration in any hole to present the plausible worst case conditions. Adoption of the worst case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 4.7.

Table 4.7 Site Characterisation by GSV (BS8485:2015+A1:2019)

CS	HAZARD POTENTIAL	GSV (L/HR) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes

- 1) The CS is equivalent to the characteristic GSC in CIRIA C665.
- 2) The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.
- 3) Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.
- 4) The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.



4.6.4. MONITORING FREQUENCY

Concentrations of methane (CH₄), carbon dioxide (CO₂) and oxygen (O₂) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 300 seconds (5 minutes) at each location, increasing to 600 seconds if elevated concentrations identified, at which points the maximum concentration of CH₄ and CO₂, together with the lowest concentration of O₂ were recorded.

In addition to the raw data, results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015+A1:2019. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can be determined.

4.6.5. SUMMARY OF MONITORING RESULTS

Table 4.8 presents the ground gas and groundwater monitoring results to date.



Table 4.8 Summary of Ground Gas Monitoring Results

LOCATION	STRATA	DATE	CH ₄ PEAK (%v/v)	CH ₄ STEADY (%v/v)	CH ₄ Q _{HG} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{HG} (l/hr)	O ₂ PEAK (%V/V)	ATMOS START (MB)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS101	Sandy CLAY	01/04/26	0.1	0.1	0.0001	0.1	0.1	0.0001	20.6	1021	Falling	0.1	0.1	1.00 - 3.00	3.00	0.60
		23/04/26	0.1	0.1	0.0001	0.3	0.3	0.0003	20.3	1029	Steady	0.1	0.1		3.00	0.64
		11/05/26	0.1	0.1	0.0001	0.9	0.7	0.0009	13.4	1009	Steady	0.1	0.1		2.88	1.32
WS103	Sandy gravelly CLAY	01/04/26	28.2	28.0	0.0282	4.2	4.2	0.0042	0.2	1020	Falling	0.1	0.1	1.00 - 3.00	2.85	Dry
		23/04/26	36.3	35.6	0.0363	5.6	5.6	0.0056	0.1	1028	Steady	0.1	0.1		2.85	Dry
		11/05/26	30.4	30.3	0.0304	5.1	5.1	0.0051	0.1	1009	Steady	0.1	0.1		2.85	Dry
WS104	MADE GROUND	01/04/26	0.7	0.6	0.0007	2.4	2.4	0.0024	2.7	1020	Falling	0.1	0.1	0.50 - 1.50	1.49	Dry
		23/04/26	0.1	0.1	0.0001	3.0	3.0	0.0030	0.1	1028	Steady	0.1	0.1		1.49	Dry
		11/05/26	0.7	0.6	0.0007	2.4	2.4	0.0024	0.1	1020	Steady	0.1	0.1		1.49	Dry
WS105	Sandy gravelly CLAY	01/04/26	0.1	0.1	0.0001	1.1	1.1	0.0011	19.0	1020	Falling	0.1	0.1	2.00 - 4.00	2.18	2.02
		23/04/26	0.1	0.1	0.0001	2.1	2.1	0.0021	18.0	1028	Steady	0.1	0.1		2.18	2.02
		11/05/26	0.1	0.1	0.0001	1.1	1.1	0.0011	18.9	1020	Steady	0.1	0.1		2.18	2.10
WS106	MADE GROUND	01/04/26	0.1	0.1	0.0001	3.9	3.8	0.0039	8.6	1020	Falling	0.1	0.1	1.00 - 2.00	2.00	1.96
		23/04/26	0.1	0.1	0.0001	4.8	4.8	0.0048	6.6	1028	Steady	0.1	0.1		2.00	1.96
		11/05/26	0.1	0.1	0.0001	3.9	3.9	0.0039	5.9	1020	Steady	0.1	0.1		2.10	2.00
WS107	Sandy CLAY	01/04/26	0.1	0.1	0.0001	0.4	0.4	0.0004	18.6	1021	Falling	0.1	0.1	2.00 - 3.00	2.95	2.53
		23/04/26	0.1	0.1	0.0001	1.4	1.4	0.0014	16.8	1029	Steady	0.1	0.1		2.95	2.55
		11/05/26	0.1	0.1	0.0001	0.1	0.4	0.0004	17.8	1020	Steady	0.1	0.1		2.97	2.55
WS109	Sandy gravelly CLAY	01/04/26	2.4	2.4	0.0024	3.6	3.6	0.0036	7.9	1021	Falling	0.1	0.1	1.00 - 3.00	2.97	2.94
		23/04/26	8.0	8.0	0.0080	4.3	4.3	0.0043	6.1	1029	Steady	0.1	0.1		2.97	Dry
		11/05/26	2.5	2.4	0.0025	3.6	3.6	0.0036	7.9	1021	Steady	0.1	0.1		2.97	2.90
WS110	Clayey gravelly SAND	01/04/26	0.1	0.1	0.0001	0.1	0.1	0.0001	20.0	1021	Falling	0.1	0.1	1.00 - 2.00	1.57	1.53
		23/04/26	0.1	0.1	0.0001	0.5	0.5	0.0005	19.2	1029	Steady	0.1	0.1		1.57	1.50
		11/05/26	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1021	Steady	0.1	0.1		1.57	1.54



LOCATION	STRATA	DATE	CH ₄ PEAK (%v/v)	CH ₄ STEADY (%v/v)	CH ₄ Q _{HG} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{HG} (l/hr)	O ₂ PEAK (%V/V)	ATMOS START (MB)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS111	Sandy CLAY	01/04/26	0.1	0.1	0.0001	0.5	0.5	0.0005	19.6	1020	Falling	0.1	0.1	1.00 - 2.00	1.94	Dry
		23/04/26	0.1	0.1	0.0001	2.4	2.4	0.0024	18.6	1028	Steady	0.1	0.1		1.94	Dry
		11/05/26	0.1	0.1	0.0001	0.5	0.5	0.0005	19.7	1020	Steady	0.1	0.1		1.94	Dry

Notes

CIRIA Characteristic Situation		Q _{HG}						
	CS1	<0.07	Typical Max CO ₂ <5 % Typical Max CH ₄ <1 %				Values in BOLD exceed CS1 Thresholds	
	CS2	<0.7	Flow rate not to exceed 70 l/hr otherwise consider increase to CS3				Values in BLUE denote water above level of response zone (flooded)	
	CS3	<3.5						
	CS4	<15	Quantitative Risk Assessment required to evaluate scope of protective measures					



4.6.6. GROUNDWATER

The water level within two of the monitoring wells (WS101, WS105) was recorded to be above the top of the response zone or within 0.50 m of the top of the response zone (flooded) during the monitoring visits completed to date, thus rendering the monitoring data for these wells unreliable.

WS103, WS104 and WS111 were noted to be dry during all monitoring visits completed to date.

Groundwater levels were observed between depths of 0.60 m and 2.94 m bgl.

4.6.7. BAROMETRIC PRESSURE

The visits completed to date were undertaken during periods of relatively high pressure, with the highest pressure recorded at 1029 m bar (Visit 2). Visit 1 was undertaken during a period of falling atmospheric pressure and Visits 2 and 3 were undertaken during periods of steady pressure.

Therefore, in order for the ground gas monitoring visits to be deemed as completed over representative conditions, future visits need to be completed during falling and/or low-pressure conditions.

4.6.8. GAS FLOW

During the monitoring completed to date, flow rates were recorded to be 0.1 l/hr (limit detection of the analyser).

4.6.9. GAS CONCENTRATIONS

Within both WS103 and WS109, elevated methane concentrations were detected during all monitoring visits completed to date. Significantly elevated methane was detected in WS103, with peak concentrations ranging from 28.2% v/v to 36.3% v/v. Peak methane concentrations recorded in WS109 ranged between 2.4% v/v to 8.0 % v/v.

Carbon dioxide concentrations were recorded at concentrations ranging from 0.1% v/v to 5.6% v/v (WS103).

Significantly depleted oxygen was also recorded in WS103 and WS104 (0.1 % v/v to 2.7 % v/v).

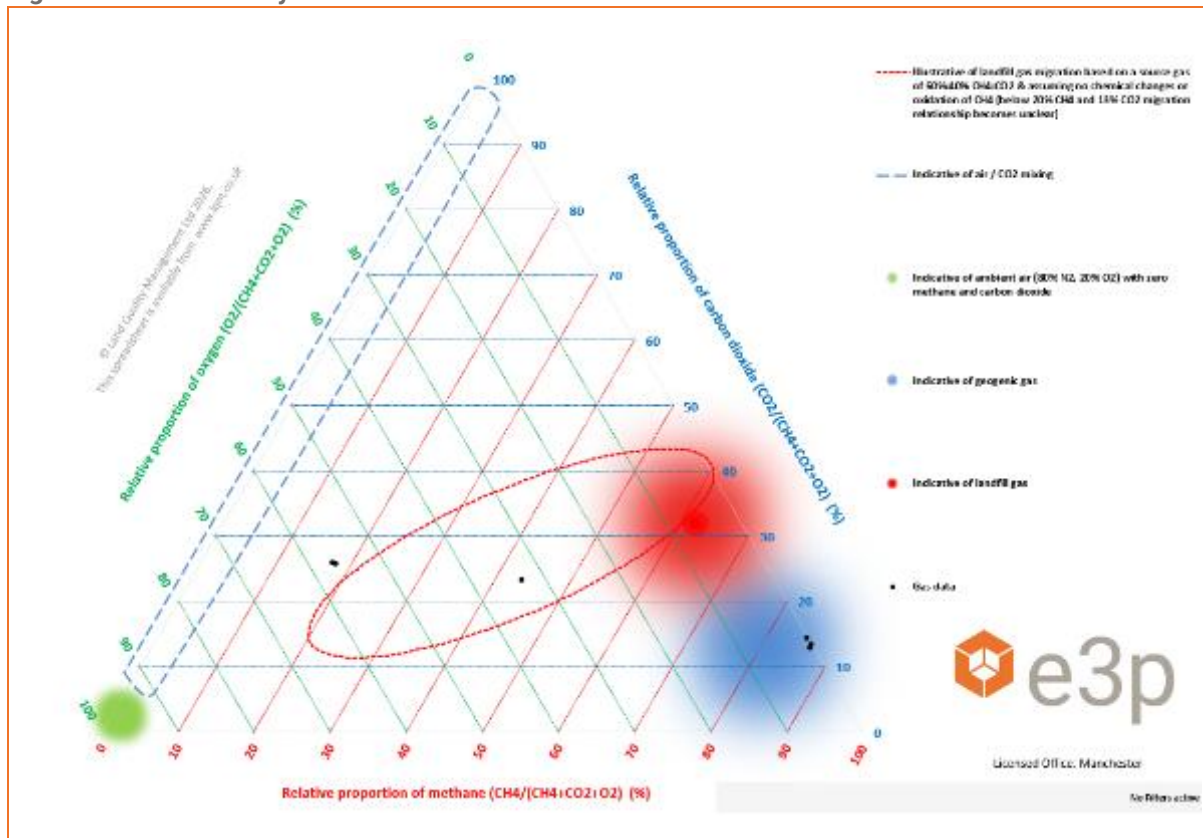
4.6.1. TERNARY PLOT FOR GROUND GAS

A ternary gas plot is a triangular plot of three variable which equal 100%. They allow the composition of gas to be identified and can help to identify the potential source of gas. As carbon dioxide is present in natural soils (such as Glacial Till), this can lead to uncertainty about whether it is necessary to increase the gas regime. On this basis, a ternary plot has been used as an assessment tool for the gas monitoring data to identify if there is a true risk.

Figure 4.2 shows the ternary gas plot for the elevated gas monitoring data from WS103 and WS109.



Figure 4.2 Ternary Gas Plot



The ternary gas plot suggests that the significantly elevated methane recorded in WS103 is indicative of a geogenic gas source.

The gas monitoring data for WS109 may be indicative of landfill gas migration, however the closest historical landfill is recorded 88 m northwest of the site for inert waste.

4.6.2. RADON RISK

Ground gas monitoring to date suggest that the site will fall into the bracket for Characteristic Situation 1, however, the site is in an area where less than 1% of homes are above the Radon Action Level, therefore radon protection measures are not required to be incorporated into any proposed new dwellings.

4.6.3. CONCLUSION

The determined Characteristic Situation for each standpipe for each visit is presented in Table 4.9. Where the monitoring well was flooded, the data has been excluded from Table 4.9.



Table 4.9 Gas Profile and Location

WELL	MAX FLOW (l/hr)	MAX CH ₄ (%V/V)	MAX CH ₄ Q _{hg} (l/hr)	MAX CO ₂ (%V/V)	MAX CO ₂ Q _{hg} (l/hr)	CHARACTERISTIC SITUATION
WS101	<i>Flooded</i>					
WS103	0.10	36.3	0.0363	5.60	0.0056	Minimum CS2 Required
WS104	0.10	0.70	0.0007	3.00	0.0030	Minimum CS2 Required
WS105	<i>Flooded</i>					
WS106	0.10	0.10	0.0001	4.80	0.0048	Minimum CS2 Required
WS107	0.10	0.10	0.0001	1.40	0.0014	Minimum CS2 Required
WS109	0.10	8.00	0.0080	4.30	0.0043	Minimum CS2 Required
WS110	0.10	0.10	0.0001	0.50	0.0005	Minimum CS2 Required
WS111	0.10	0.10	0.0001	2.40	0.0024	Minimum CS2 Required

Although elevated concentrations of methane and carbon dioxide have been recorded, no flow has been observed, therefore the hazardous gas flow rates fall within a CS1 classification.

Unflooded mine workings are generally not capable of generating a persistent source of methane because the conditions necessary for methane production—such as anaerobic (oxygen-free) environments—are absent. Methane is typically produced through the anaerobic decomposition of organic material, which requires waterlogged, oxygen-depleted conditions. Decaying timber was identified within the shallow Made Ground in WS103 which may be contributing to the production of methane. It is also considered possible that the former sewage works adjacent to the east is a residual source of methane.

Concentrations of carbon monoxide and hydrogen sulphide were recorded below the analysers' limit of detection and therefore are not considered to be a cause for concern.

A Radon Class 1 has been applied to the site; therefore, no radon protective measures are required in the construction of new residential dwellings.

Fundamentally, due to the site being underlain by shallow coal workings, the site should be classified as CS2 as the risk from mining related gas is high.

A post remediation assessment will be required following the completion of the drill and grouting works to confirm the ground gas classification.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed with the local authority prior to their adoption on site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

As part of the detailed design, a Gas Protection Design Report will be required to mitigate hazardous ground gasses in accordance with BS8485 and CIRIA 735 and with consideration of CL:AIRE Good Practice for Risk Assessment for Coal Mine Gas Emissions (2021). This can only be completed as and when the post remediation gas regime is understood, and the sub-structure is designed.



4.7. POTABLE WATER SUPPLY

This section provides a summary of the site investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites."

Table 4.10 Pipeline Selection Assessment

CONTAMINANT GROUP	PE THRESHOLD (mg/kg)	CONCENTRATIONS AT CURRENT PIPELINE DEPTH (mg/kg)
Total VOC	0.5	N/A
Total BTEX And MTBE	0.1	N/A
Total SVOCs (Excluding PAH and those substances marked with an *)	2	N/A
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<1.00
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	4.5
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	160
Phenols (From SVOC Analysis)*	2	N/A
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	N/A
Ethers*	0.5	N/A
Nitrobenzene*	0.5	N/A
Ketones*	0.5	N/A
Aldehydes*	0.5	N/A
Amines	Fail	N/A
Other Considerations		
Are there any exceedances of the PE threshold outside of the pipeline depth?	Yes – elevated concentrations of TPH C21-C35 have been identified at a concentration of 660 mg/kg in WS112A at 0.30 m bgl.	
Is free product present in soil and groundwater?	No free phase products have been identified.	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	Groundwater level appears to remain consistent across the site, with hardstanding limiting the free infiltration of rainwater which could potentially mobilise hydrocarbon impact.	
Will soils impacted with above determinands likely be utilised elsewhere on site?	Currently unknown.	
Will soils be imported to site as part of any future earthworks?	Currently unknown. The importation of materials may affect the WIR Risk Assessment which should be updated after completion.	

Notes: Pipeline depth normally between 0.75m – 1.35 m

The pipeline selection will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during this site investigation.



4.8. DEVELOPED CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis and risk assessment, the conceptual model shown in Table 4.11 has been prepared for the site.



Table 4.11 Developed Conceptual Site Model

CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
HUMAN HEALTH		
Made Ground (Historical Development, Tanks, Mill, Factory, off-site Sewage Works, Tanks, Garage, Works) Heavy metals, PAHs, TPHs Electrical Substation PCBs	Accidental ingestion and/or dermal contact with contaminated soil and/or leachate. PL1/PL2 Inhalation of contaminated dust PL3	Human Health – construction workers Human Health – end users
Discussion No elevated concentrations of heavy metals, PAHs, or TPHs which would pose a significant risk to proposed end users via a dermal contact or ingestion have been identified in the chemical soil analysis. Given the sites use as industrial land, there is still considered to be a potential residual risk from areas not investigated to date. However, when considering the low sensitivity of the proposed development, and the limited areas of potential soft landscaping it is considered all residual risk can be mitigated through the installation of a suitable clean cover system in any soft cover areas. An electrical substation is present in the northwest sector of the site. This feature was constructed during the 1970's, meaning that PCBs may have been used within the electrical infrastructure. Sampling for PCBs will be required when access is available.		
Probability: Likely	Consequence: Minor	Level of Risk: Low
Made Ground (Historical Development, Tanks, Mill, Vehicle Storage, Factory, off-site Tanks, Garage, Works) TPHs, volatile PAHs (naphthalene), S/VOCs	Inhalation of vapours PL4 Migration through permeable strata and preferential pathways PL5	Human Health – end users Human Health – Off-site receptors
Discussion No elevated concentrations of volatile contaminants have been identified and the soil data analysis has not identified any detectable concentrations of TPH C5-C6 that might otherwise be indicative of VOC impact. In addition, no visual or olfactory evidence of contamination has been identified in the underlying Made Ground or natural superficial deposits. Further post demolition investigation is required in the location of the existing warehouse to confirm the presence/absence of any impact.		
Probability: Low Likelihood	Consequence: Mild	Level of Risk: Low



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
Made Ground (Historical Development), Existing Buildings Asbestos (Asbestos containing materials (ACM) and loose fibres)	Inhalation (of fibres) Construction works disturbing bound material and releasing fibres. PL3	Human Health – construction workers, end land users, and users of adjacent sites

Discussion

Asbestos in the form of loose amosite fibres has been identified in the granular Made Ground within WS103 at a concentration of <0.001% wt/wt (trace fibres). Asbestos in the form of chrysotile has also been identified within WS107 at <0.001% wt/wt (trace fibres) and within WS112A at a concentration of 0.069% wt/wt in the shallow Made Ground deposits.

It should be assumed that asbestos fibres are present throughout the Made Ground, therefore it is recommended that any enabling works resulting in ground disturbance be completed in accordance with an asbestos management plan with suitable control measures implemented (e.g. appropriate PPE, RPE and air monitoring).

No visual signs of asbestos-containing materials (ACMs) were encountered during the ground investigation. Asbestos is likely to be present within the existing structures. A pre-demolition asbestos survey will be required within all existing buildings within the site boundary.

Probability: Likely	Consequence: Medium	Level of Risk: Moderate
Made Ground (Historical Development, Tanks, Mill, Vehicle Storage, Factory, off-site Tanks, Garage, Works) Organic contaminants such as hydrocarbons, solvents	Ingestion of tainted water supply. PL7	Human Health – End users Water pipeline

Discussion

Based upon the current site conditions, barrier pipe is likely to be required to mitigate any potential risks associated with unidentified areas of potential contamination. A UKWIR pipeline assessment is suggested following completion of remedial works, as site conditions are likely to vary from current.

Probability: Low Likelihood	Consequence: Mild	Level of Risk: Low
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CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
CONTROLLED WATERS		
Made Ground (Historical Development, Tanks, Mill, Vehicle Storage, Factory, off-site Tanks, Garage, Works) Heavy Metals, TPHs, PAHs, S/VOCs	Contact with contaminated groundwater PL2 Migration to the Secondary A bedrock aquifer PL5 Migration to Logwood Mill Brook PL5	Human Health – site personnel Human Health – Consumer Aquatic ecosystems

Discussion

Chemical analysis of groundwater and leachate analysis has primarily identified elevated concentrations of heavy metals, with a singular instance of elevated fluoranthene in the groundwater sample when compared to Environmental Quality Standards (EQS), and a single instance of elevated selenium when compared to Drinking Water Standards (DWS).

Logwood Mill Brook located at the eastern boundary is considered to be the primary receptor. The identified contaminants are generally of low solubility and mobility, therefore migration towards the brook is considered unlikely.

Surface water samples should be obtained from the brook to establish baseline conditions prior to the instigation of remediation works.

Probability: Low Likelihood	Consequence: Mild	Level of Risk: Low
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GROUND GAS

Made Ground (Historical Development, Tanks, off-site Sewage Works, Tanks, Garage, Works), Underlying coal workings Methane and carbon dioxide	Inhalation of ground gas PL4 Accumulation of ground gas in confined spaces (asphyxiation or explosion) PL4	Human Health – site personnel Human Health – end users Infrastructure and services
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Discussion

Within both WS103 and WS109, elevated methane concentrations were detected during all monitoring visits completed to date. Significantly elevated methane was detected in WS103, with peak concentrations ranging from 28.2% v/v to 36.3% v/v. Peak methane concentrations recorded in WS109 ranged between 2.4% v/v to 8.0 % v/v. Carbon dioxide concentrations were recorded at concentrations ranging from 0.1% v/v to 5.6% v/v (WS103).

Although elevated concentrations of methane and carbon dioxide have been recorded, no flow has been observed, therefore the hazardous gas flow rates fall within a CS1 classification. Fundamentally, due to the site being underlain by shallow coal workings, the site should be classified as CS2 as the risk from mining related gas is high.

A post remediation assessment will be required following the completion of the drill and grouting works to confirm the ground gas classification.



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
As part of the detailed design, a Gas Protection Design Report will be required.		
Probability: High Likelihood	Consequence: Medium	Level of Risk: High
Radon	Inhalation of ground gas PL4 Accumulation of ground gas in confined spaces (carcinogenic)	Human Health – site personnel Human Health – end users

Discussion

The site is situated within an area where less than 1% of homes are deemed to be affected by Radon. Therefore, no precautionary measures are required in the construction of the proposed development.

Probability: Unlikely	Consequence: Minor	Level of Risk: Very Low
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INFRASTRUCTURE AND DEVELOPMENT

Made Ground Sulphate from potential ash within the Made Ground	Sulphate attack on PL6	Building concrete
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Discussion

Chemical analyses for pH and soluble sulphate content suggests that the soils generally meet class DS-1, AC-1. All concrete should be designed in accordance with this classification.

Probability: Low Likelihood	Consequence: Minor	Level of Risk: Very Low
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Made Ground Phytotoxic contaminants	Direct contact (plant uptake) PL8	Flora
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Discussion

The chemical data has identified phytotoxic contaminants (heavy metals) within Made Ground deposits.

Given the proposed development comprises a large commercial unit, any areas of proposed landscaping are suggested to have a cover system which would sever potential pathways to proposed end users (flora).

Probability: Low Likelihood	Consequence: Minor	Level of Risk: Very Low
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PL1 = Soil Ingestion, PL2 = Dermal Contact and Ingestion, PL3 = Dust Inhalation, PL4 = Vapour/Gas Inhalation, PL5 = Vertical/Lateral Migration, PL6 = Corrosion of Concrete, PL7 = Tainting of Water Supply, PL8 = Uptake by Plants



FROM CIRA 552 (2001)		RISK ASSESSMENT MATRIX			
		Consequence			
		SEVERE	MEDIUM	MILD	MINOR
Probability	HIGH LIKELIHOOD	Very High	High	Moderate	Moderate / Low
	LIKELY	High	Moderate	Moderate / Low	Low
	LOW LIKELIHOOD	Moderate	Moderate/ Low	Low	Very Low
	UNLIKELY	Moderate / Low	Low	Very Low	Very Low



5. MINING ASSESSMENT

Based on the preliminary coal mining risk assessment detailed within report ref: (18-824-R1-1, dated May 202), an intrusive coal mining assessment is required to determine the potential risk of shallow coal workings, with the details provided within the following section.

5.1. SCOPE OF INTRUSIVE GROUND INVESTIGATION

In due consideration of the potential presence of the Tenlands Mine (Ravenhead Main Delf) sub-crop in the west of the site, a series of rotary boreholes has been advanced in accordance with Mining Remediation Authority Permission ref: 31312 to assess the potential presence of shallow workings within this seam and the potential for ground instability to induce a future subsidence event within the proposed development.

5.2. SUMMARY OF GROUND INVESTIGATION WORK

Rotary Boreholes to Investigate Workings in Coal

Five rotary boreholes have been advanced at the locations detailed within the E3P Exploratory Hole Location Plan (Drawing 18-824-006) at positions to interject the potential coal seams and assess the potential for any workings.

Table 5.1 Rotary Boreholes

ROTARY BOREHOLE	DEPTH TO ROCKHEAD (m bgl)	EVIDENCE OF MINING/SEAM	REMARKS
RB101	3.10	Intact coal: 3.80–4.90 m bgl	No loss of flush, voided, or broken ground encountered during drilling
RB102	3.60	Intact coal: 3.00–3.60 m bgl Intact coal: 14.30–15.30 m bgl	
RB103	5.40	No coal encountered	
RB104	2.30	Broken Ground: 6.40–6.80 m bgl Void: 6.80–12.90 m bgl Hard drilling and potential steel encountered: 12.80–12.90m bgl	Broken ground and voided ground with total loss of flush encountered 6.80–12.90 m bgl.
RB105	2.30	Intact coal: 6.20–7.00 m bgl Intact coal: 7.60–8.50 m bgl Intact coal: 15.10–15.70 m bgl Intact coal: 21.40–22.30 m bgl	No loss of flush, voided, or broken ground encountered during drilling.



5.3. SUMMARY OF COAL MINING ISSUES

The intrusive ground investigation comprising five, deep, rotary boreholes identified intact shallow coal seams within three of the rotary boreholes, ranging in thickness between 0.60 m to 1.10 m, from depths between 3.00 m bgl to 22.30 m bgl.

It is likely that RB102 is positioned at the Tenlands Mine sub-crop, given coal was identified directly beneath the superficial deposits at 3.00-3.60 m bgl. RB105 is positioned to the south of the Tenlands Mine sub-crop and encountered rockhead at 2.30 m bgl and coal at 6.20 m bgl.

The coal identified in RB101 at 3.80-4.90 m bgl and in RB102 at 14.30–15.30 m bgl is considered to represent the Bastions Mine which sub-crops to the north of the site. The depth of the coal suggests that the Bastions Mine may sub-crop closer to the site boundary than it is currently mapped.

Coal was not encountered in RB103, located to the east of the mapped fault in the central, eastern sector.

In RB104 to the south of the site, evidence of possible coal extraction was identified from 6.40 m bgl to 12.90 m bgl where broken ground followed by a void was encountered. Directly beneath the void, a potential steel structure was noted from 12.80-12.90 m bgl which may indicate an object left in a pillar and stall mine.

There is insufficient rock cover above the identified coal seams and evidence of shallow workings has been identified, therefore proof drilling will be required across the proposed building footprint and infrastructure with pressure grouting. Where voids are identified, a secondary (and, if necessary, tertiary) grid will be implemented with subsequent pressure grouting.

Additionally, further instances of shallow coal are likely to be encountered at the location of the sub-crop. Where this interacts with proposed foundations coal will need to be removed and the footing founded beneath. A minimum of 1m cover must remain to manage potential gassing issued from an exposed coal crop. Any extractions required should be completed under an Incidental Coal Extraction permit application with the Mining Remediation Authority, with appropriate mitigation measures adopted to the substructure that will be designed by the structural engineers.

Given the historical mining setting of the site, there remains a risk that unrecorded mine entries may be present within the development area. In addition, the shallow depth to coal measures and evidence of historically disturbed and broken ground indicate the potential presence of former bell pits and other shallow artisanal workings which may not be identified within available Coal Authority records. Such features represent a potential geotechnical hazard due to the possibility of localised collapse, variable ground conditions and zones of weakened or poorly compacted infill material. Accordingly, an allowance for unforeseen shallow mining features should be incorporated within the development risk assessment and any intrusive investigation or remediation strategy.

The Mining Remediation Authority and Local Planning Authority will require a specification for the consolidation of Abandoned Mine Workings to be prepared to ensure all works are fully designed with suitable verification processes.



6. GEOTECHNICAL ASSESSMENT

6.1. SOIL CONSISTENCY

Undrained shear strength values were measured using laboratory undrained triaxial tests. The results of the tests are presented in Table 6.1, which indicates that the clay soils vary from soft to very stiff. Strength test data are generally consistent with the field descriptions of the aforementioned soils.

Table 6.1 Summary of Laboratory Undrained Shear Strength Triaxial Test

LOCATION/DEPTH	LABORATORY DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m ²)	CONSISTENCY
WS101 2.50–3.00 m	Grey, brown silty slightly sandy slightly gravelly CLAY	71	Firm
WS103 2.50–3.00 m	Grey, brown silty slightly sandy slightly gravelly CLAY	90	Stiff
WS108 4.50–5.00 m	Grey, brown silty slightly sandy slightly gravelly CLAY	30	Soft

Results of the standard penetration tests, including undrained shear strengths derived from SPTs are included in Table 6.2.



Table 6.2 Standard/Cone Penetration Test Results

LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
WS101	1.00	Sandy CLAY	9	9.07	N/A	Medium strength	Stiff	45.37	93.27
WS101	2.00		20	17.39	N/A	High strength	Very Stiff	86.97	178.80
WS101	3.00		50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS102	1.00	Gravelly SAND	8	8.07	Loose	N/A	N/A	N/A	80.65
WS102	2.00	Gravelly CLAY	11	10.05	N/A	Medium strength	Stiff	50.24	103.30
WS102	3.00		8	6.96	N/A	Low strength	Firm	34.79	71.52
WS102	4.00	Sandy CLAY	13	10.98	N/A	Medium strength	Stiff	54.92	112.91
WS102	4.70		22	18.34	N/A	High strength	Very Stiff	91.68	188.50
WS103	1.00	Gravelly CLAY	7	7.06	N/A	Low strength	Firm	35.29	72.55
WS103	2.00	Sandy CLAY	16	14.62	N/A	Medium strength	Stiff	73.08	150.26
WS103	3.00		50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS104	1.00	MADE GROUND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS104	2.00	Gravelly CLAY	11	10.05	N/A	Medium strength	Stiff	50.24	103.30
WS104	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS105	1.00	MADE GROUND	4	4.03	Loose	N/A	N/A	N/A	40.33
WS105	2.00	Gravelly CLAY	20	18.27	N/A	High strength	Very Stiff	91.35	187.82
WS105	3.00	Gravelly SAND	6	5.22	Loose	N/A	N/A	N/A	52.18
WS105	4.00	Sandy CLAY	18	15.21	N/A	High strength	Very Stiff	76.04	156.33
WS105	4.70		50	41.67	N/A	Very high strength	Very Stiff	208.37	428.41
WS106	1.00	MADE GROUND	20	20.16	Medium Dense	N/A	N/A	N/A	201.63



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
WS106	2.00	Sandy CLAY	5	4.57	N/A	Low strength	Firm	22.84	46.96
WS106	3.00		32	27.83	N/A	High strength	Very Stiff	139.14	286.08
WS106	3.30		50	43.04	N/A	Very high strength	Very Stiff	215.20	442.46
WS107	1.00	MADE GROUND	5	5.04	Loose	N/A	N/A	N/A	50.41
WS107	2.00	Sandy CLAY	6	5.48	N/A	Low strength	Firm	27.41	56.35
WS107	3.00		9	7.83	N/A	Low strength	Firm	39.13	80.46
WS107	4.00		50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS108	1.00	MADE GROUND	6	6.05	Loose	N/A	N/A	N/A	60.49
WS108	2.00	Gravelly CLAY	7	6.39	N/A	Low strength	Firm	31.97	65.74
WS108	3.00		12	10.44	N/A	Medium strength	Stiff	52.18	107.28
WS108	4.00	Sandy CLAY	13	10.98	N/A	Medium strength	Stiff	54.92	112.91
WS108	5.00		41	34.01	N/A	Very high strength	Very Stiff	170.07	349.67
WS109	1.00	Sandy CLAY	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS109	2.00		20	18.27	N/A	High strength	Very Stiff	91.35	187.82
WS109	3.00		50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS110	1.00	Gravelly SAND	9	9.07	Loose	N/A	N/A	N/A	90.73
WS110	2.00	MUDSTONE	50	45.68	Dense	N/A	N/A	N/A	456.77
WS111	1.00	Sandy CLAY	15	15.12	N/A	High strength	Very Stiff	75.61	155.46
WS111	2.00	SANDSTONE	50	45.68	Dense	N/A	N/A	N/A	456.77
WS112A	1.00	Gravelly CLAY	14	14.11	N/A	Medium strength	Stiff	70.57	145.09
WS112A	2.00		20	18.27	N/A	High strength	Very Stiff	91.35	187.82



NOTES

* The Allowable Bearing Capacity (ABC) should be considered indicative.

The interpretation of in situ mass undrained shear strength (c_u) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).

Allowable bearing capacity on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.

**Where the SPT fell through under self-weight, the N-value has been recorded as 1 for comparative purposes.



6.2. SOIL PLASTICITY

The Atterberg limits determinations, summarised in Table 6.3, show the clay to be of moderate plasticity.

Table 6.3 Summary of Plasticity Index Test Results

LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
WS101	2.00	19.0	14	38	24	95	22.8	Medium
WS102	5.00	17.1	14	40	26	85	22.1	
WS104	3.00	14.5	14	38	24	96	23.04	
WS105	2.00	17.6	14	37	23	94	21.62	
WS107	4.00	17.6	14	37	23	94	21.62	
WS108	2.00	19.3	14	39	25	93	23.25	
WS111	1.00	15.7	15	37	22	93	20.46	
WS112A	1.00	20.0	15	37	22	96	21.12	

The results of the Atterberg limits testing confirmed that the soils would be deemed to be “Medium Volume Change Potential” in accordance with the classification system utilised by the LABC / NHBC industry guidance.

6.3. CONSOLIDATION

An undisturbed sample of Glacial Till was submitted for oedometer analysis. The results are provided in Table 6.4.

Table 6.4 Oedometer Consolidation Results

LOCATION	DEPTH (m)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE (kPa)	Mv (m ² /year)	Cv (m ² /year)
WS107	3.50-4.00	U100	20.3	75	0.24	4.46
				150	0.20	4.41
				300	0.07	4.07
				600	0.03	3.64
				75	0.00	

When considered at over-burdened pressure with an additional load of 110 kPa the coefficient of volume compressibility (Mv) was 0.20 m²/MN. The material is considered to be of medium compressibility.

The rate at which settlement is likely to occur is determined by the coefficient (Cv). As shown in Table 12.4, the coefficient ranges from 3.64 m²/yr to 4.46 m²/yr. The rate at which settlement will occur is increased by the presence of sand within the Glacial Till and it is likely that settlement will occur over a period of years.



6.4. PH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in APPENDIX VII (summarised in Table 6.5), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1 in accordance with BRE *Special Digest 1* (2005).

Table 6.5 Summary of pH and Sulphate Data

LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
WS101	0.80	0.0482	7.5	DS-1, AC-1
WS101	1.10	0.0274	7.9	DS-1, AC-1
WS103	0.10	0.113	11.6	DS-1, AC-1
WS104	0.90	0.164	8.0	DS-1, AC-1
WS106	1.20	0.044	7.9	DS-1, AC-1
WS107	0.50	0.189	8.0	DS-1, AC-1
WS109	0.10	0.0806	11.5	DS-1, AC-1
WS109	1.40	0.0719	5.4	DS-1, AC-3z
WS110	0.10	0.0447	9.6	DS-1, AC-1
WS111	0.90	0.0253	7.6	DS-1, AC-1
WS112A	0.30	0.04	8.6	DS-1, AC-1

6.4.1. HIGHWAYS AND CONCRETE

MCHW Series 600 provides a criteria of 1500 mg/l for water-soluble sulphate within 500mm of any concrete surface. A second criteria of 300mg/l is given with respect to soils within 500mm of steel structures.

6.5. GROUNDWATER

Table 6.6 Summary of Groundwater Strikes

LOCATION	DEPTH (m bgl)	DESCRIPTION OF STRIKE	STRATA	EVIDENCE OF CONTAMINATION
Site Investigation Water strike Information				
WS102	2.00	Slow Ingress	CLAY	No
WS105	2.00	Slow Ingress	CLAY	No
WS107	2.50	Slow Ingress	CLAY	No
Groundwater Monitoring Summary from Installations				
WS101	0.60-1.32	N/A	CLAY	No
WS105	2.02-2.10		CLAY	No
WS106	1.96-2.00		CLAY	No
WS107	2.53-2.55		CLAY	No
WS109	2.90-2.94		CLAY	No
WS110	1.50-1.54		CLAY	No

The presence of groundwater appears common within the superficial geology between 1.50 to 2.50 m bgl.

Water strikes were recorded during the intrusive investigation, these were typically associated with the natural cohesive deposits which created a perched waterbody.



6.6. SITE PREPARATION

Our assessment has been based on the fact that the site will be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Document for Highway Works (MCHW)*. This should include the following:

- ✦ Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.
- ✦ Demolition of all existing buildings and removal of all concrete hardstanding.
- ✦ Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
- ✦ Buried structures and old foundations should be excavated from below the proposed development footprint with the resulting void backfilled.

6.7. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the safe allowable bearing capacity (ABC) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 6.7.

Table 6.7 Summary of ABC

GRANULAR SOILS			
Description	Depth (Range m bgl)	Relative Density	Allowable Bearing Capacity (kN/m ²)
Gravelly SAND	1.00–3.00	Loose	52.18–90.73
MUDSTONE	2.00	Dense	456.77
SANDSTONE	2.00	Dense	456.77
COHESIVE SOILS			
Description	Depth (Range m bgl)	Undrained Shear Strength (Cu) (kN/m ²)	Allowable Bearing Capacity (kN/m ²)
Soft low strength CLAY	1.00–3.00	22.84–39.13	49.96–80.46
Firm medium strength CLAY	1.00–4.00	40.33–73.08	82.91–150.26
Stiff high strength CLAY	2.00–4.70	75.61–139.14	155.46–286.08
Very stiff, very high strength CLAY	3.00–5.00	170.07–217.41	349.67–447.00

The localised gravelly SAND identified between 1.00–3.00 m bgl is noted to be loose, with an ABC of between 52.18–90.73 kN/m².

MUDSTONE and SANDSTONE bedrock at 2.00 m bgl has been identified to be dense, with an ABC of 456.77 kN/m².

Soft CLAY was identified at depths of between 1.00–3.00 m bgl in WS102, WS103, WS106, WS107 and WS108, with an ABC in the range of 49.96–80.46 kN/m². Firm CLAY was identified between 1.00–4.00



m bgl, with an ABC of between 82.91–150.26 kN/m². Stiff to very stiff CLAY was recorded at depths of between 2.00 m and 5.00 m bgl, with an ABC of >150 kN/m².

6.8. FOUNDATION OPTIONS APPRAISAL

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe allowable bearing capacity, the following recommendations have been developed for the site of the potential foundation solutions that may be adopted for future commercial development. The suitable target founding stratum has been identified as the underlying stiff to very stiff clays and the mudstone and sandstone bedrock.

Prior to the construction of any foundation solution, a programme of remediation and enabling works will be required to remove existing foundation and slab structures and re-engineer the site to provide suitable development platform levels.

Upon removal of the relict foundations and infrastructure, it is likely that an engineered foundation solution will be required.

The final foundation solution will be dependent on the structural loadings, and elevation and should be designed by a suitably qualified structural engineer with detailed designs from a specialist contractor.

Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirement of NHBC standards.

Where foundations are located over treated shallow workings. spread and trench fill foundations (strips and rafts) are required to be suitably reinforced to span soft spots (3m span and 1.5m cantilever). It is desirable to maintain bearing pressures below 160kN/m² at the grouted horizons – Piles are not generally suitable unless founded below the grouted horizons (typically, this is also a potential for pile installation to disturb workings or shafts Refer to CIRIA SP32 and C758 for details.

Foundations which encounter coal, should be brought to a depth below the coal. The sides of foundations should be protected when they are in contact with coal.

6.9. GROUND FLOOR SLABS

A ground bearing slab will be viable, but it will need to be constructed on a granular sub-base with the thickness designed by a structural engineer to ensure that settlement tolerance is taken into consideration.

6.10. SETTLEMENT

The site has been appraised through desk based information and site investigation data in order to inform geotechnical risk where possible. Table 6.8 has been formulated to determine if settlement risks are required to be further appraised. Where any item is determined to be appraised a settlement appraisal for the site should be prepared upon receipt of development levels and layout.



Table 6.8 Summary of Geotechnical Information for Settlement

RISK	COMMENT	ASSESSMENT
Site is located in an area deemed to be at Risk from Ground Dissolution from desk based information.	The site is stated to have a negligible risk of ground dissolution based on BGS data searches.	No further assessment
Site is in an area where geology is reported as having a compressible risk from desk based information.	The site is stated to have a negligible risk based on BGS data searches.	No further assessment
Do historical maps indicate relic excavation features such as opencast or ponds that have been infilled.	None identified.	No further assessment
Has the site been proven to be underlain by anthropogenic materials to an unknown specification?	Yes, filled ground to a maximum proven depth of 5.40 m bgl (RB103).	Further assessment required
Have oedometers and/or ground conditions reported compressible stratum on site?	Yes, testing suggests that the clay is considered to be of medium compressibility.	Further assessment required
Have High walls been identified on site that could result in differential settlement?	None identified.	No further assessment
Has any evidence been observed on site indicating settlement (non-structural assessment)	None identified.	No further assessment
Is voided ground present beneath the site?	Yes - In RB104 to the south of the site, evidence of possible coal extraction was identified from 6.40 m bgl to 12.90 m bgl where broken ground followed by a void was encountered.	Further assessment required
Is the site in an area where a mobile groundwater regime is present in influencing distance of foundations and infrastructure?	The site is likely to be within a mobile groundwater regime given the close proximity of Logwood Mill Brook.	Further assessment required
Will the site be subject to changes in site levels that may induce heave or settlement?	To be confirmed.	Further assessment required

The site has been appraised as having a potential future settlement risk. In order to determine the level of risk and appropriate mitigation options a detailed settlement appraisal is required for the site. This does not form a part of the structural engineers settlement calculations associated with the sub structure however loadings will need to be considered for surcharging both static and variable pressures.



6.11. HEAVE PRECAUTIONS

In areas underlain by cohesive soils where the proposed structure is within the conjectured zone of tree influence, foundations will require the incorporation of specialist heave precautions due to the potential for volumetric soil movement associated with seasonal moisture variation and root activity.

The specific foundation solution, including the requirement for heave protection measures (e.g. increased foundation depth, compressible material, and reinforcement), will be defined by the geotechnical engineer within the plot-specific foundation key plan, which should be referred to during the detailed design and construction stages.

6.12. DRAINAGE

Where loose or soft materials have been identified at drainage levels, there will need to be consideration for the use of reinforced pipe bedding.

Shrinkage and heave of clay soils can affect pipelines. To protect against the effects of heave, drainage should be designed:

- ✦ To take account of potential ground movement as shown in Table 6.9, including where pipes and services pass through substructure walls or foundations.
- ✦ With gradients which may need to be steeper.
- ✦ To use alternative means of catering for the movement when sufficient falls cannot be provided, for example, by deepening the excavation and laying pipework on a granular bedding of suitable thickness to reduce the extent of potential movement.

Table 6.9 Potential Ground Movement for Drainage

VOLUME CHANGE POTENTIAL	HIGH	MEDIUM	LOW
Potential Ground Movement	150mm	100mm	50mm

6.13. EXCAVATIONS

Site observations indicated that excavations should be feasible in the near surface with normal plant; however, obstructions are anticipated in the near surface, including former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

However, due to the depth and variability of the Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.

If local pumping of groundwater is required during the advancement of excavations for the proposed foundations, then consideration should be given to the potential for dewatering gravels in the surrounding areas that may cause structural damage to building substructures in close proximity to the site.



Table 6.10 Civil Engineering Excavation Risk Matrix

RISK ITEM	PRESENT	COMMENT
Running Sand	No	Not identified.
Water Ingress to Excavation	Yes	Minor water ingress will require localised dewatering/sump pumping during the construction of site drainage infrastructure. Ingress of water into foundation excavation will potentially flood foundation excavations, limiting the viability
Shallow Bedrock	Yes	Shallow bedrock is present which may impede the excavation to form drainage infrastructure and foundations.

6.14. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated into the site works:

- ✿ Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub formations to foundations and pavement construction.
- ✿ Excavations where access is required should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support system in accordance with CIRIA R97 should be utilised.
- ✿ It is considered that dewatering may be required, especially following periods of heavy rainfall. Removal of surface water and water withing trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required, and consideration should be given to provision of space for settling tanks or an attenuation pond.
- ✿ Where access to confined spaces is required, appropriate mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.
- ✿ The presence of potential contamination and mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.
- ✿ The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risk, reduce their impact and finally, to include the use of personnel protective equipment (PPE).



6.15. DEVELOPED GEOTECHNICAL RISK REGISTER

POTENTIAL CONSTRAINT	LOCATION ON-SITE	ASSESSMENT AND MITIGATION
Remediation of contaminated soils	TBC	It should be assumed that asbestos fibres are present throughout the Made Ground, therefore it is recommended that any enabling works resulting in ground disturbance be completed in accordance with an asbestos management plan with suitable control measures implemented (e.g. appropriate PPE, RPE and air monitoring). A pre-demolition asbestos survey will be required within all existing buildings within the site boundary. Further investigation is required post-demolition.
Bedrock	All	Rockhead was encountered at depths of between 1.70 m and 3.10 m bgl. Shallow bedrock may impede the excavation to form drainage infrastructure and foundations.
Cohesive Stratum overlying shallow Bedrock (<3.00m)	All	
Obstructions	(Warehouse, Existing Structures)	Existing foundations beneath the warehouse will need to be removed and grubbed out.
Artificially levelled and filled platforms	All	The site has been artificially levelled to create the development platform, with areas of deep Made Ground identified.
Trench collapse	All	Due to the variable ground conditions across site, trial trench collapse is possible site wide and will require trench boxes to prevent collapse.
Drainage Invert levels	TBC	Localised areas of loose sands have been identified between 1.00-3.00 m bgl.
Mature Trees	North East	Mature and semi mature trees are present along the northern and eastern site boundaries
Volume Change Potential Clay	All	The clay soils are of medium volume change potential.
Concrete Design	All	The concrete classification is DS-1, AC-1. All concrete should be designed based in accordance with the identified concrete classifications.
Low-Permeability Ground	All	Cohesive superficial deposits are likely to be of low permeability.
Services/Sensitive Structures	TBC	A formal utility survey has not been completed. A surface water sewer is recorded to cross the north of the site. Combined sewers are recorded along the northern boundary and in the south of the site, with connections to the existing warehouse. An electricity substation is present in the northwest of the site.



POTENTIAL CONSTRAINT	LOCATION ON-SITE	ASSESSMENT AND MITIGATION
Abnormal Foundation Solutions	All	It is likely that an engineered foundation solution will be required.
Areas Not Investigated	South (Warehouse)	The area beneath the existing warehouse was not investigated. Post demolition ground investigation works will be required.
Surface Water Features	East	Logwood Mill Brook is located at the eastern site boundary.
Mining	All	Evidence of shallow mine workings has been identified, therefore mine stabilisation works will be required.
Consolidation & Settlement	All	The site has been appraised as having a potential future settlement risk. In order to determine the level of risk and appropriate mitigation options a detailed settlement appraisal is required for the site.
Enabling Earthworks	All	Enabling works are required to prepare the site for the proposed development.

6.16. FURTHER WORKS

Based on the findings of the intrusive site investigation, the following additional works are recommended to be completed in due course:

- ✳ Further post demolition ground investigation.
- ✳ Foundations to be designed by structural engineer.
- ✳ Settlement Analysis for earthworks design.
- ✳ Geotechnical Design Report.
- ✳ Geotechnical Earthworks Specification.
- ✳ Remediation and Enabling Works Strategy.
- ✳ Asbestos Management Plan.
- ✳ Performance Specification for Consolidation of Abandoned Mine Workings.
- ✳ Specification for Mitigation of Hazardous Ground Gases & Verification Plan.
- ✳ Construction phase Surface Water Management Plan.

Vibration monitoring and assessment by a specialist consultant will be required if ground engineering works are to be completed in proximity to sensitive structures and infrastructure.

END OF REPORT

Appendix I: Limitations





GENERAL

This report and any associated works (together comprising the "Services") were compiled and carried out by E3P for the client (as present in Section 1) under the E3P "Terms of Business" or with those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.

Unless explicitly agreed otherwise, in writing, this report has been prepared under E3P Standard Terms and Business as included within our proposal to the Client.

Project-specific appointment documents may be agreed upon at our discretion and a charge may be levied for both the time to review and finalise appointment documents and also for associated changes to the appointment terms. E3P reserves the right to amend the fee should any changes to the appointment terms create an increased risk to E3P.

The report needs to be considered in light of the proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEOENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: This section covers reports with the following titles or combination of titles: Phase 1; Desktop Study; Geoenvironmental Assessment; Development Appraisal; Preliminary Environmental Risk Assessment; Constraints Report; Due Diligence Report; Geotechnical Development Review; Environmental Statement; Environmental Chapter; Baseline Environmental Assessment; Project Scope Summary Report (PSSR), Program Environmental Impact Report (PEIR), Geotechnical Development Risk Register; Agricultural Land Assessment; Mineral Safeguarding Assessment; Desk Top Coal Mining Risk Assessment; Hydrogeological Appraisal; Construction Environmental Management Plan; and Site Water Management Plan.

The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walkover inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects' responses may not have been received from all parties. E3P cannot be held responsible for any disclosures that are provided post-production of our report and will not automatically update our report.

The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, E3P reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the site.

Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and does not constitute or replace full and proper surveys completed by suitably qualified and experienced specialists in these fields.

E3P does not warrant work/data undertaken/provided by others.



INTRUSIVE INVESTIGATION REPORTS

Coverage: The following report titles (or combination) may cover this category of work: Geoenvironmental Site Investigation; Geotechnical Assessment; GIR (Ground Investigation Reports); Preliminary Environmental And Geotechnical Risk Assessment; Preliminary Summary; Coal Mining Risk Assessment, Ground Gas Addendum; and, Geotechnical Risk Register.

The investigation has been undertaken to provide information concerning either:

- The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
- Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.

The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

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

For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.

For geotechnical investigations, the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.

The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.

The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report

The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, E3P has used reasonable skill and care to extrapolate conditions between these points based on assumptions to develop our interpretation and conclusions.

The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation and at the time of the investigation.

Conditions can change between investigation points both spatially and over time and these interpretations should therefore be considered indicative. The assessment of extreme weather events and their impact on ground conditions is not within the scope of E3P's work

The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of



any future changes or amendments to these values. Specific assumptions associated with the risk assessment process have been outlined within the body or associated appendix of the report.

Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

Where soil contamination concentrations recorded as part of this investigation are used for commentary on the potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed and the waste classification and any subsequent disposal option agreed upon with licenced subcontractors and/or the relevant regulators.

The results of the asbestos testing are factually reported and interpretation is given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and/or trace loose asbestos fibres within the soil matrix at the site.

If costs have been included in relation to additional site works, and/or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.

In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIATION AND ENABLING WORK STRATEGY REPORTS

These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected based on the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

The outputs of the Detailed Quantitative Risk Assessments are based upon the manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.

Before adoption on-site, assessment criteria will need to be discussed and agreed upon with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales



associated with the Regulatory Authority engagement are not within the control of E3P. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

E3P does not accept liability for any subcontract work that has not been completed in strict accordance with an approved E3P Remediation and Enabling Works Strategy.

GEOTECHNICAL DESIGN REPORT (GDR)

The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS AND BUILD PHASE MITIGATION)

These reports are factual and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of earthworks or remedial works.

The data is presented and will be compared with assessment criteria.

Appendix II: Glossary





ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
MRA	Mining Remediation Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAP L	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAP L	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation



MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AI RE	Contaminated Applications in Land: Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection
PFAS	Per- and Poly-Fluorinated Substances	PFOA	Perfluorooctanoic Acid

Appendix III: CIRIA 552 Risk Classification





CIRIA C552:2001 – Classification of Consequence

CLASSIFICATION	CATEGORY	DEFINITION
SEVERE	Humans	Short-term (acute) risk to human health likely to result in “significant harm” as defined by the Environmental Protection Act 1990, Part 2a
	Controlled Water	Short-term risk of pollution of sensitive water resource
	Property	Catastrophic damage to buildings/property
	Ecology	Short-term risk to a particular ecosystem or organism forming part of such ecosystem
MEDIUM	Humans	Chronic damage to human health (“significant harm” as defined in DEFRA, 2006)
	Controlled Waters	Pollution of sensitive water resources
	Ecological Systems	Significant change in a particular ecosystem or organism forming part of such ecosystem
	Humans	Chronic damage to human health (“significant harm” as defined in DEFRA, 2006)
MILD	Controlled Waters	Pollution of non-sensitive water resources
	Property	Significant damage to buildings, structures, crops and services (“significant harm” as defined in DEFRA, 2006) and damage to sensitive buildings/structures and services
	Ecological Systems	Damage to the environment
MINOR	Humans	Non-permanent health effects to human health that are easily prevented by the use of PPE
	Property	Easily repairable effects of damage to buildings, structures and services
	Financial / Project	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve

CIRIA 552:2001 Classification of Probability

RISK	DEFINITION
LOW	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
LOW MODERATE	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the Site.
MODERATE	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or



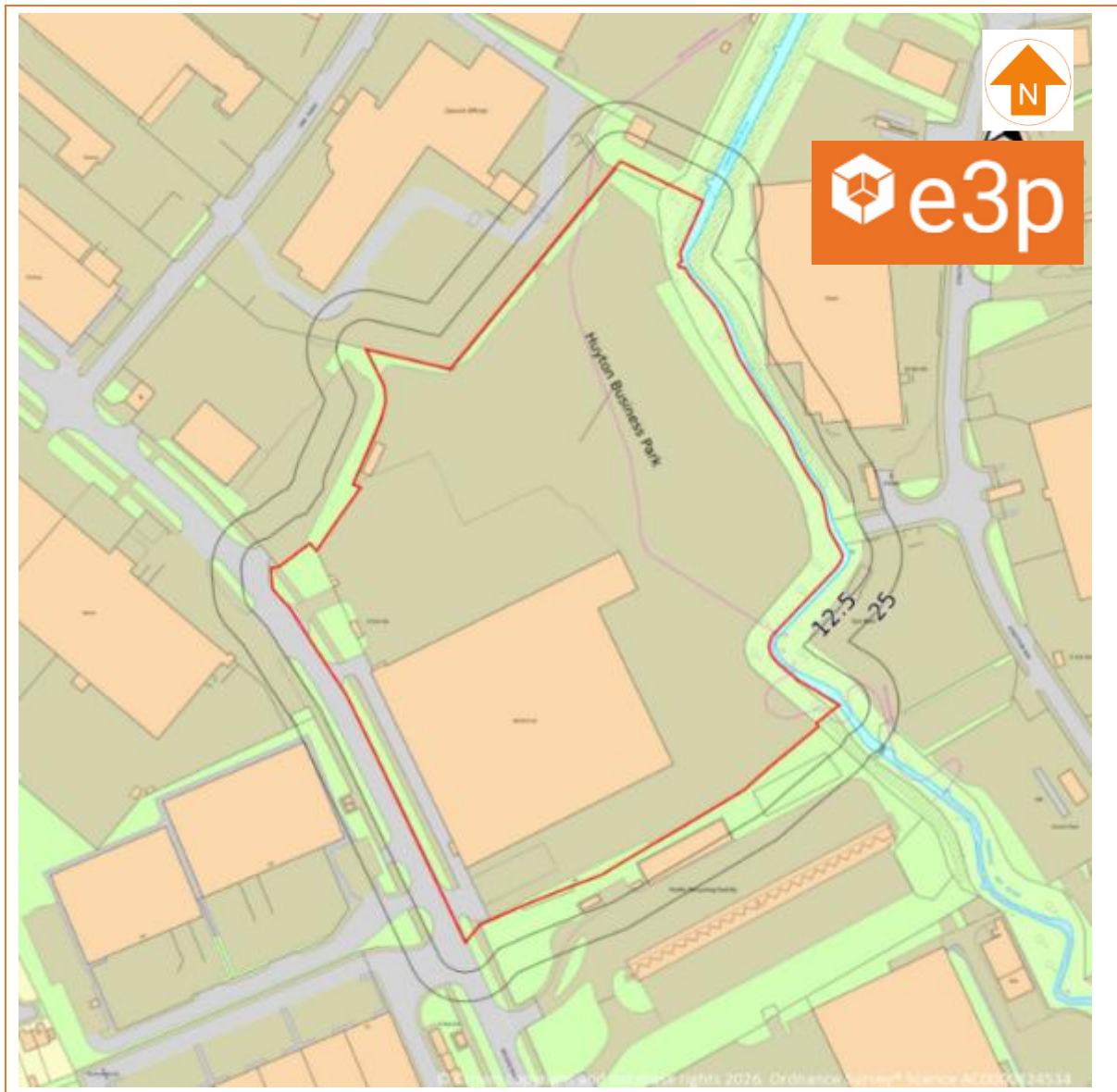
	undertake further environmental improvements. Redevelopment of the Site will likely require further site investigation.
MODERATE HIGH	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment, including intrusive ground investigations.
HIGH	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine the level of risk and associated liability.

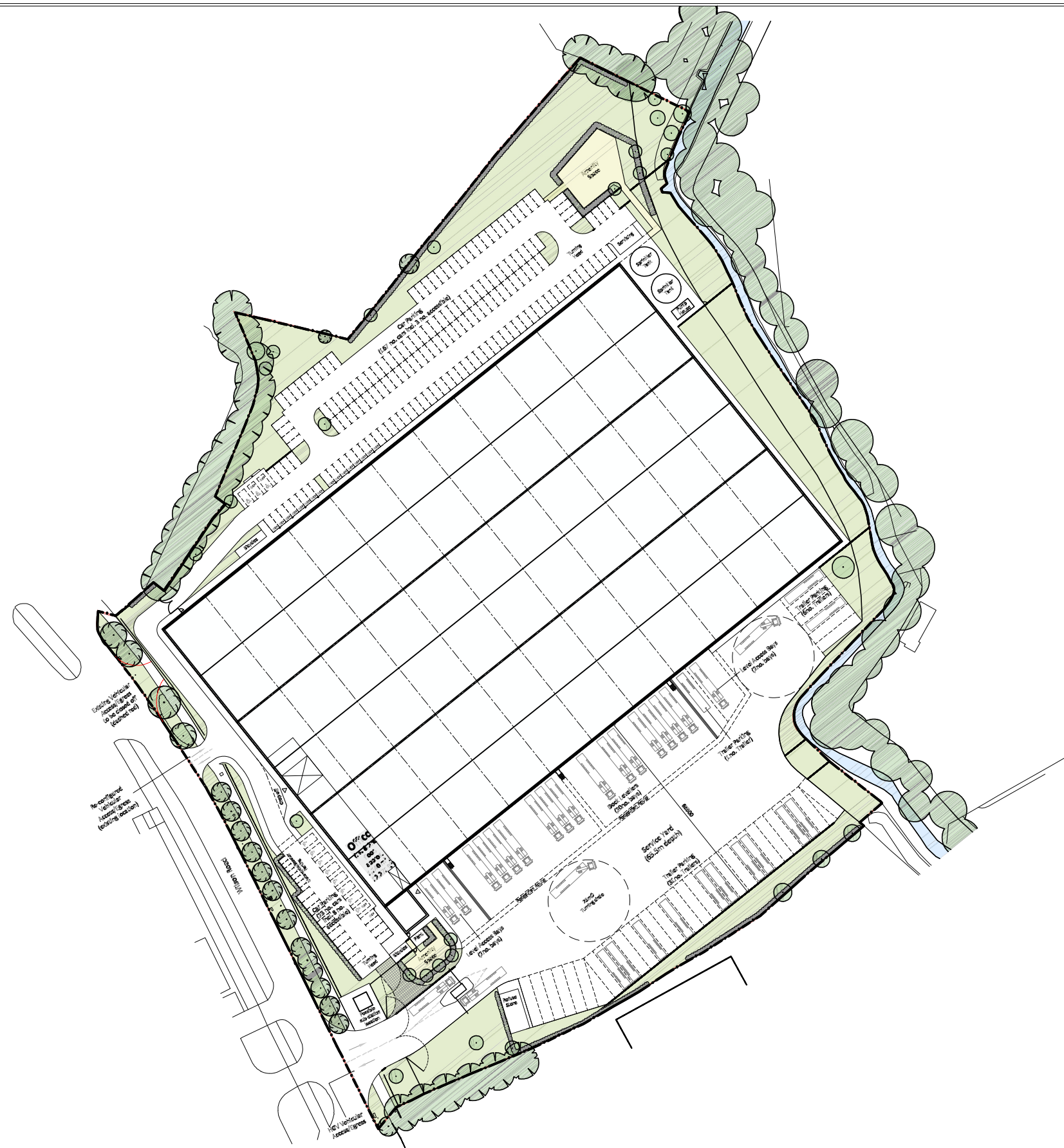
Appendix IV: Drawings



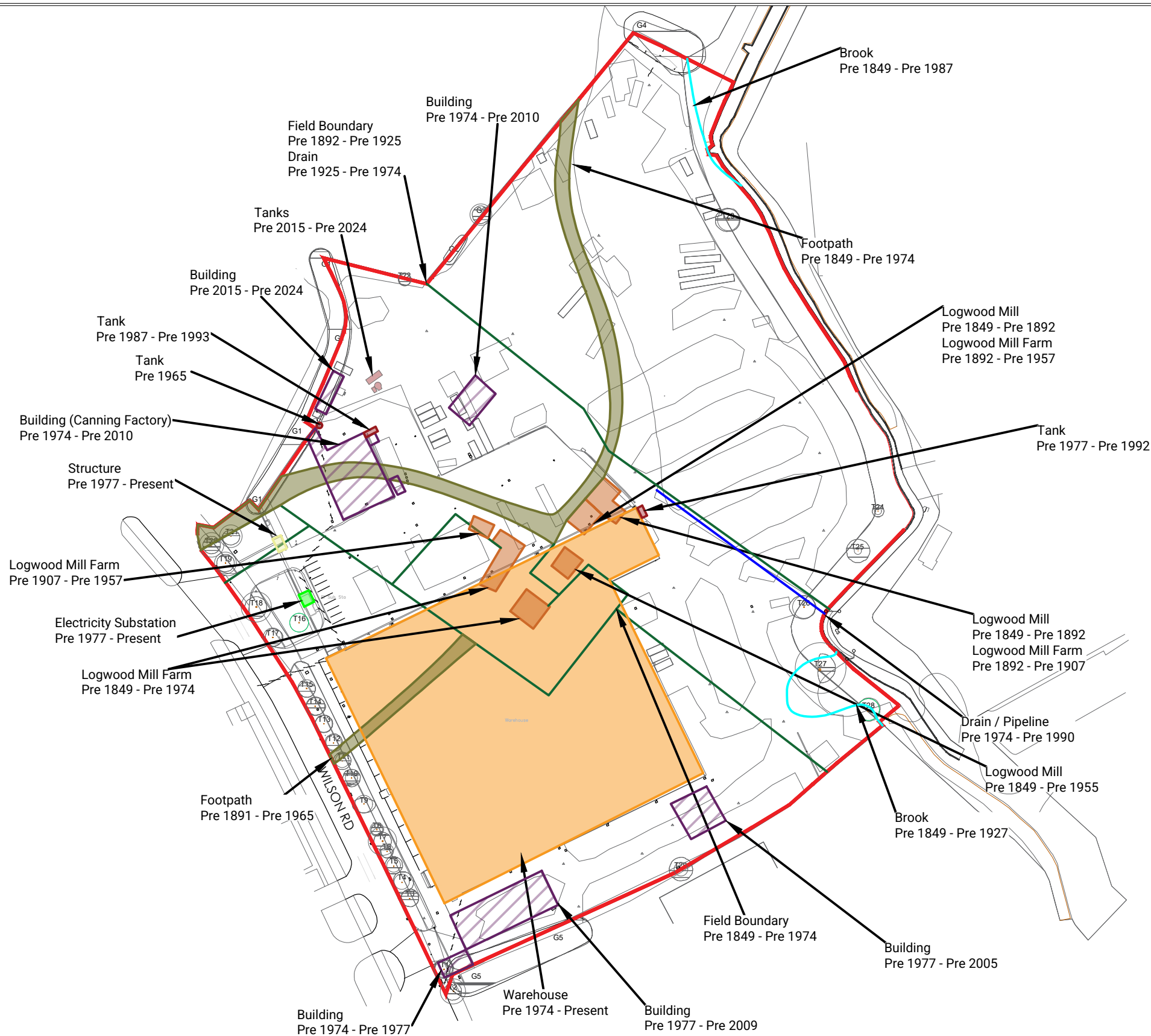


DRAWING 18-824-R1-001 – SITE LOCATION MAP





Notes:						Client: DJL Construction NW Ltd		Job No: 18-824		Date: 06.03.2026		 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk											
								Drawing No: 002		Scale: NTS													
<table><tr><td>P1</td><td>REVA</td><td>06.03.2026</td><td>TG</td><td>HT</td><td>HT</td></tr><tr><td>Phase</td><td>Issue</td><td>Date</td><td>Drawn</td><td>Checked</td><td>PM</td></tr></table>						P1	REVA	06.03.2026	TG	HT	HT	Phase	Issue	Date	Drawn	Checked	PM	Job Title: Wilson Road, Huyton		Drawing Title: Proposed Development Plan		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.	
P1	REVA	06.03.2026	TG	HT	HT																		
Phase	Issue	Date	Drawn	Checked	PM																		



Key	
	Logwood Mill / Logwood Mill Farm
	Structure
	Warehouse
	Tank
	Building
	Footpath
	Electricity Substation
	Footpath
	Field Boundary
	Brook
	Drain

Notes:					
P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

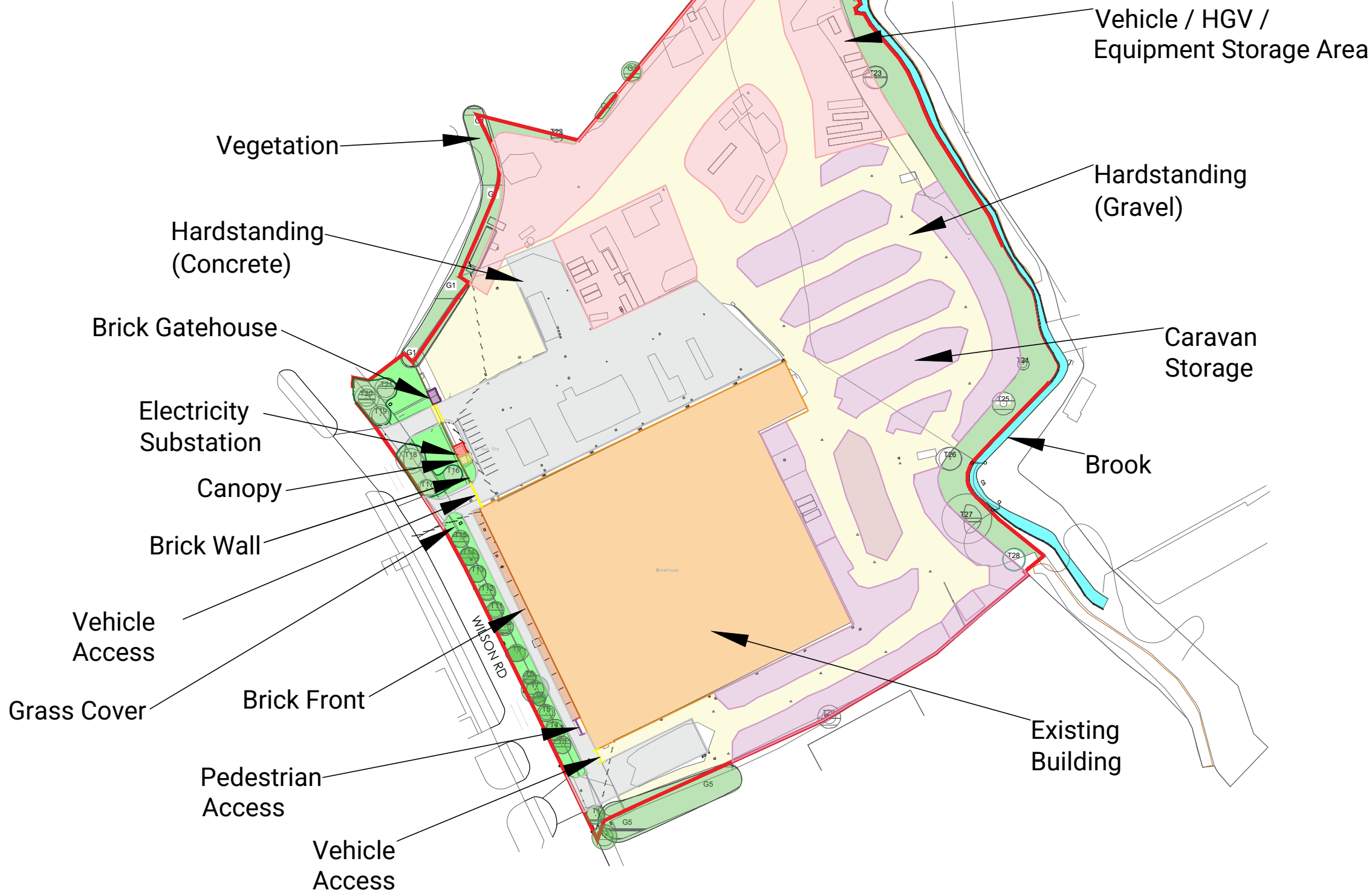
Client:	
DJL Construction NW Ltd	
Job Title:	
Wilson Road, Huyton	

Job No:	18-824
Drawing No:	003
Date:	18.05.2026
Scale:	NTS
Drawing Title:	
Historical Features Plan	



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Key	
	Brick Front
	Existing Building
	Caravan Storage
	Vegetation
	Grass Cover
	Brook
	Pedestrian Access
	Vehicle Access
	Hardstanding (Concrete)
	Hardstanding (Gravel)
	Brick Gatehouse
	Electricity Substation
	Canopy
	Brick Wall

Notes:					
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Phase	Issue	Date	Drawn	Checked	PM

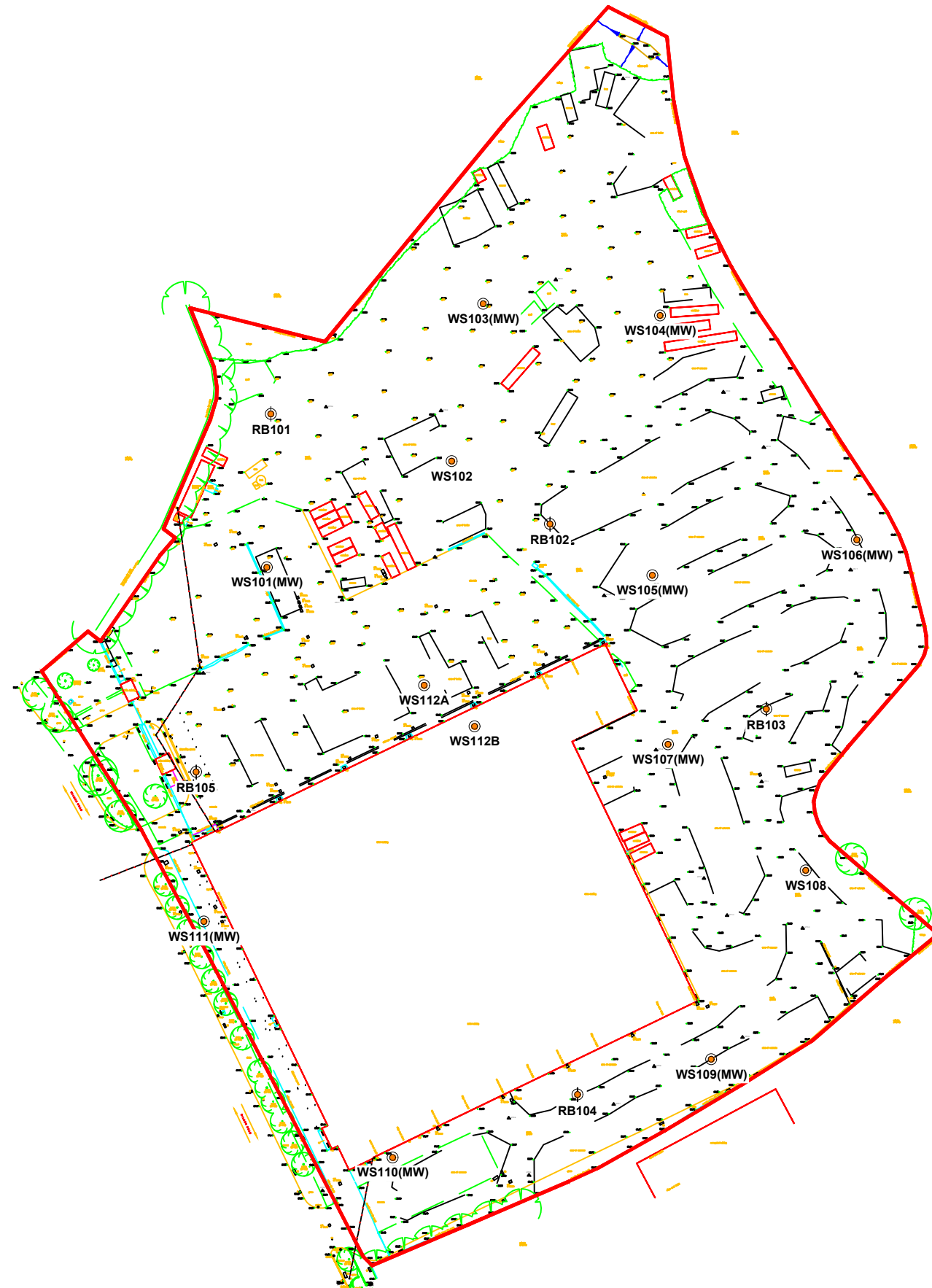
Client:
DJL Construction NW Ltd
Job Title:
Wilson Road, Huyton

Job No:
18-824
Drawing No:
004
Date:
18.05.2026
Scale:
NTS
Drawing Title:
Site Features Plan



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- Location Symbols
-  Approximate Window Sample Probehole Location
 -  Approximate Window Sample Probehole Location with Install
 -  Approximate Rotary Borehole Location

Notes:					

Client:
DJL Construction NW Ltd

Job No:
18-824
Drawing No:
006
Date:
18.05.2026
Scale:
NTS



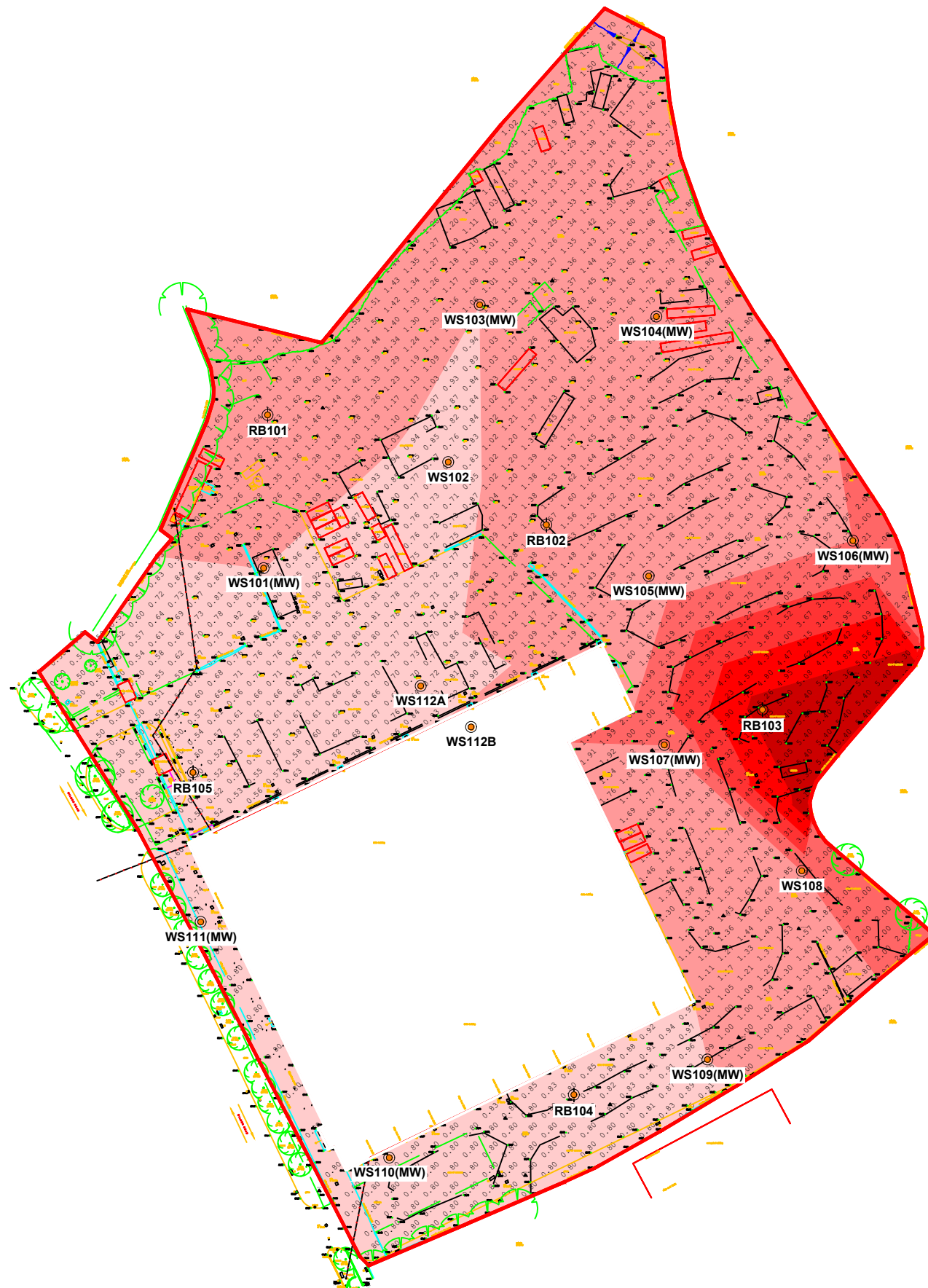
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Website: www.e3p.co.uk

P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

Job Title:
Wilson Road, Huyton

Drawing Title:
Exploratory Hole Location Plan

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- Location Symbols
- Approximate Window Sample Probehole Location
 - Approximate Window Sample Probehole Location with Install
 - Approximate Rotary Borehole Location

- Made Ground Depth (m)
- Depth of Made Ground 0.00 - 0.99m
 - Depth of Made Ground 1.00 - 1.99m
 - Depth of Made Ground 2.00 - 2.99m
 - Depth of Made Ground 3.00 - 3.99m
 - Depth of Made Ground 4.00 - 4.99m
 - Depth of Made Ground >5.00m

Notes:

P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

Client:

DJL Construction
NW Ltd

Job Title:

Wilson Road, Huyton

Job No:	18-824	Date:	18.05.2026
Drawing No:	007	Scale:	NTS

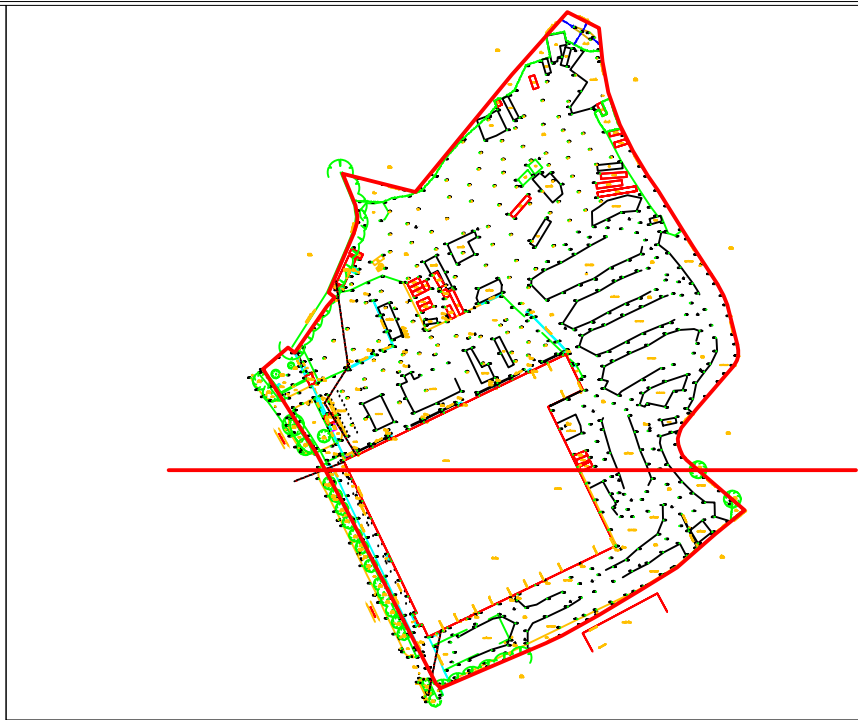
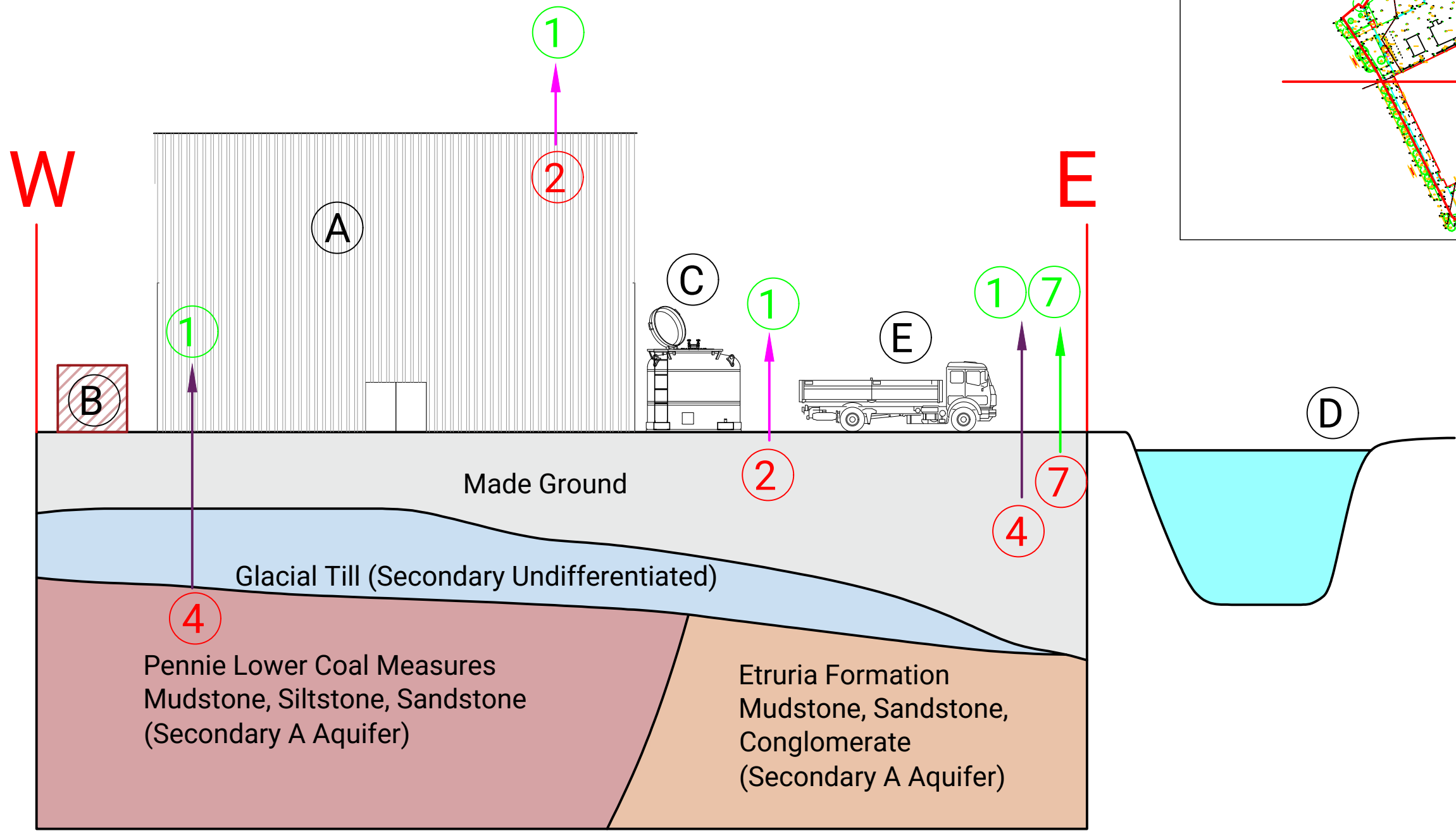
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Depth To Made Ground Plan

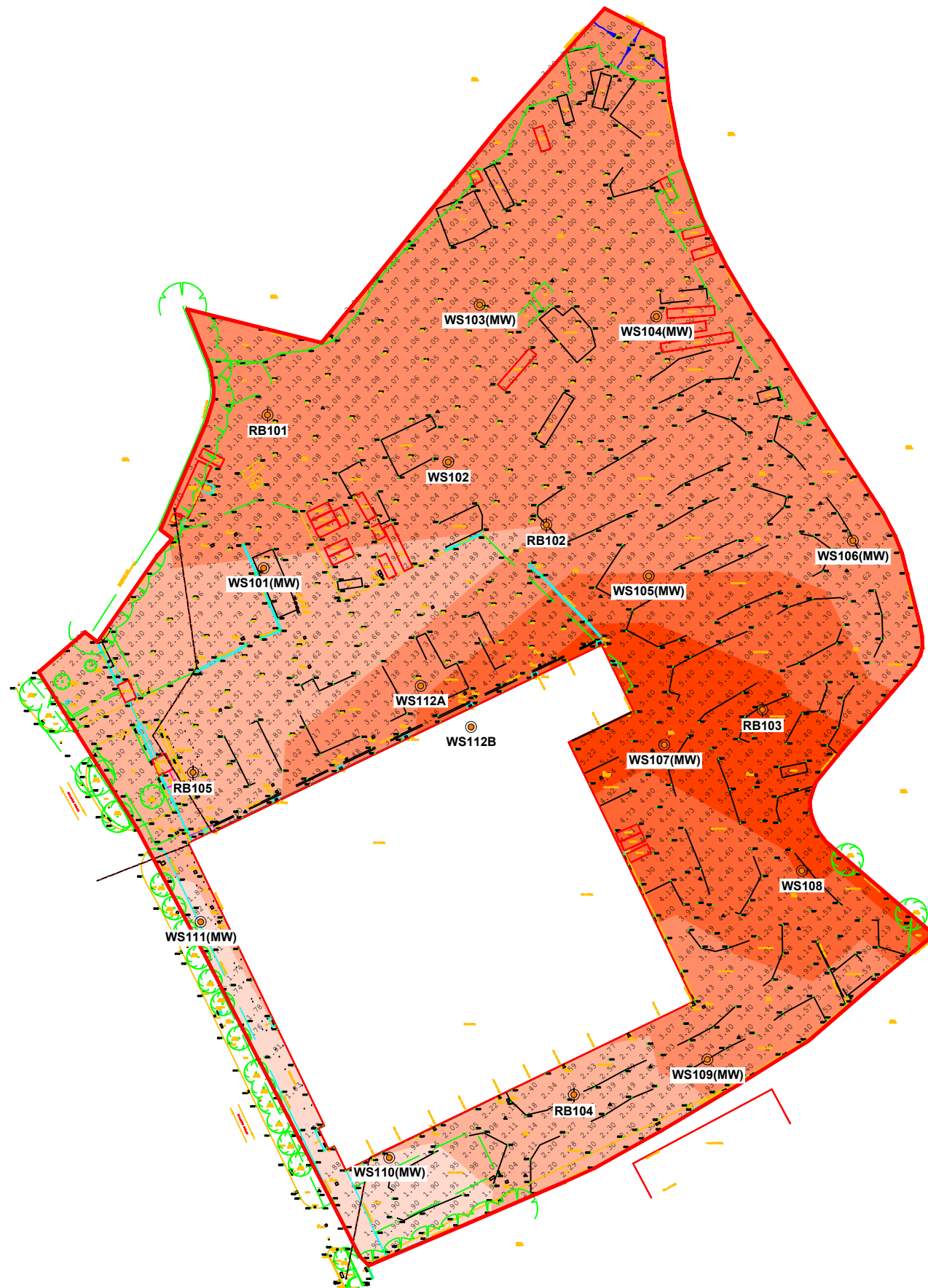


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Geology Key Made Ground Glacial Till Pennie Lower Coal Measures Etruria Formation	Sources ① Heavy Metals, Non Volatile PAH's, Non Volatile TPH's (Made Ground) ② Asbestos (Made Ground, Existing Buildings) ③ Volatile Contaminants (Former Tanks, Made Ground) ④ Ground Gases (Made Ground, Coal Workings) ⑤ Mobile Contaminants (Made Ground) ⑥ Sulphate (Made Ground) ⑦ Phytotoxic Contaminants (Made Ground)	Pathways Dermal Contact / Ingestion Vapour Inhalation Inhalation / Accumulation Tainting of Water Supplies Dust Inhalation Vertical / Lateral Migration Sulphate Attack on Concrete Plant Uptake	Receptors ① Future End Users ② Water Pipes ③ Groundwater (Secondary B Aquifer) ④ Surface Water Features ⑤ Off-site Receptors ⑥ Building Structure ⑦ Flora	Site Features Ⓐ Warehouse Ⓑ Electricity Substation Ⓒ Former Tank Ⓓ Brook Ⓔ HGV / Caravan Storage	Notes:						Client: DJL Construction NW Ltd		Job No: 18-824	Date: 18.05.2026	e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk	
											Job Title: Wilson Road, Huyton		Drawing No: 011	Scale: NTS		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.
					P1 Phase	REVA Issue	18.05.2026 Date	TG Drawn	NS Checked	NS PM	Drawing Title: Conceptual Site Model					



Location Symbols		Bedrock Depth (m)	
	Approximate Window Sample Probehole Location		Depth to Bedrock 1.00 - 1.99m
	Approximate Window Sample Probehole Location with Install		Depth to Bedrock 2.00 - 2.99m
	Approximate Rotary Borehole Location		Depth to Bedrock 3.00 - 3.99m
			Depth to Bedrock 4.00 - 4.99m
			Depth to Bedrock >5.00m

Notes:					
P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

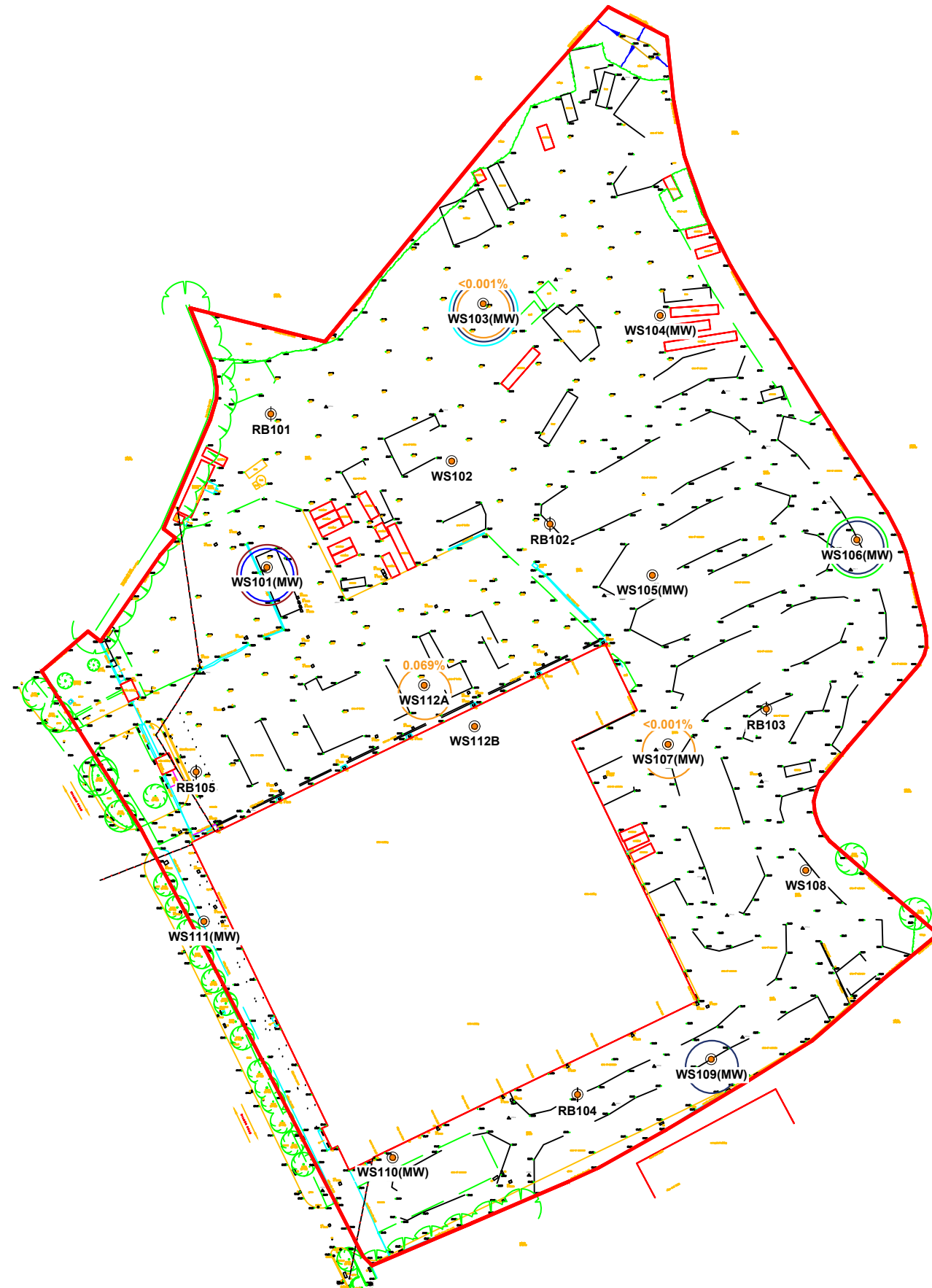
Client:	DJL Construction NW Ltd
Job Title:	Wilson Road, Huyton

Job No:	18-824	Date:	18.05.2026
Drawing No:	012	Scale:	NTS
Drawing Title:		Depth Of Bedrock Plan	



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- Location Symbols
- WS101 Approximate Window Sample Probehole Location
 - WS101(MW) Approximate Window Sample Probehole Location with Install
 - RB101 Approximate Rotary Borehole Location
- Contamination Exceedances - Soils
- Asbestos
- Contamination Exceedances - Groundwater
- Heavy Metals
 - Fluoranthene
- Contamination Exceedances - Leachate
- Heavy Metals
 - Total Cyanide
 - pH

Notes:					
P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

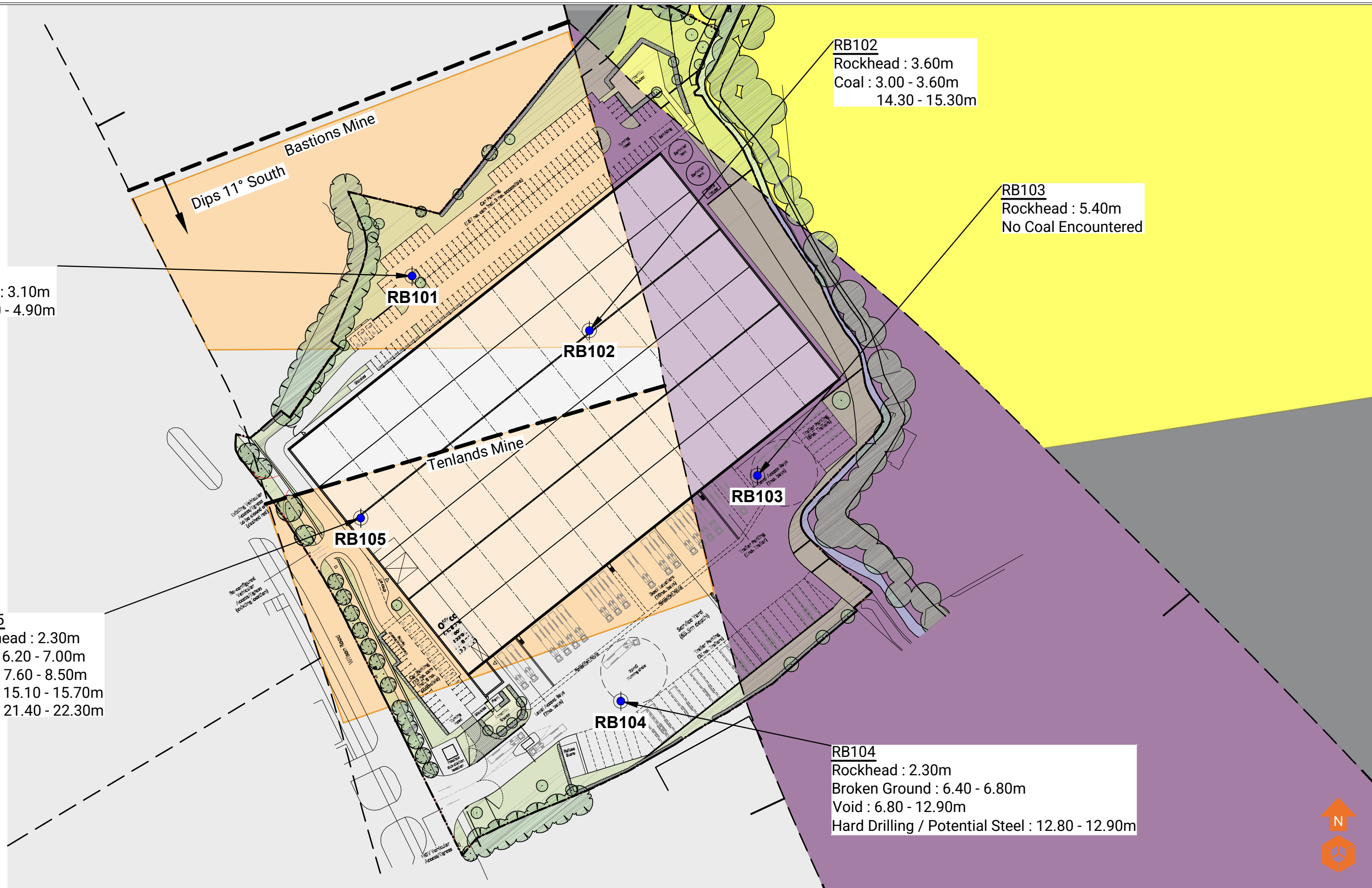
Client:	DJL Construction NW Ltd
Job Title:	Wilson Road, Huyton

Job No:	18-824
Drawing No:	014
Date:	18.05.2026
Scale:	NTS
Drawing Title:	Contamination Exceedances Plan



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RB101
Rockhead : 3.10m
Coal : 3.80 - 4.90m

RB102
Rockhead : 3.60m
Coal : 3.00 - 3.60m
14.30 - 15.30m

RB103
Rockhead : 5.40m
No Coal Encountered

RB105
Rockhead : 2.30m
Coal : 6.20 - 7.00m
7.60 - 8.50m
15.10 - 15.70m
21.40 - 22.30m

RB104
Rockhead : 2.30m
Broken Ground : 6.40 - 6.80m
Void : 6.80 - 12.90m
Hard Drilling / Potential Steel : 12.80 - 12.90m

Location Symbols
Approximate Rotary Borehole Location

- Key
- Zone Of Possible Shallow Workings
 - Etruria Formation - Mudstone, Sandstone And Conglomerate
 - Pennine Middle Coal Measures Formation - Sandstone
 - Pennine Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone
 - Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone
 - Coal Outcrop
 - Geological Fault

Notes:					
P1	REVA	18.05.2026	TG	NS	NS
Phase	Issue	Date	Drawn	Checked	PM

Client:
DJL Construction NW Ltd

Job Title:
Wilson Road, Huyton

Job No:	18-824	Date:	18.05.2026
Drawing No:	018	Scale:	NTS
Drawing Title:		Coal Mining Issues Plan	

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Appendix V: Photographs





Plate 1 WS102 Soil Arisings



Plate 2 WS104 Soil Arisings





Plate 3 WS105 Soil Arisings



Plate 4 WS108 Soil Arisings



Appendix VI: Exploratory Hole Logs





Window Sampler

WS101
Sheet 1 of 1

Hole Type WS	Easting 345694.48	Northing 389995.74	Ground Level (m) 26.22	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
						(0.35)		CONCRETE	
					25.87	0.35		MADE GROUND: Brown slightly sandy gravelly clay. Gravel is fine to coarse, angular to rounded of brick, mudstone, sandstone, coal, and concrete.	0.5
		0.80	ES 1			(0.65)			
		1.00	SPT	N=9 (2,2/2,2,2,3)	25.22	1.00		Stiff medium strength brown sandy CLAY.	1.0
		1.10	ES 1						
									1.5
		2.00	SPT	N=20 (3,3/5,5,5,5)		(2.42)		Becoming very stiff high strength (2.00 - 3.00m)	2.0
		2.50-3.00	L 1						2.5
		3.00	SPT	N=50 for 265mm (8,13/13,14,16,7 for 40mm)				Becoming very stiff very high strength (3.00 - 3.42m)	3.0
					22.80	3.42		End of Borehole at 3.42m	3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 3.42 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 3.00 m bgl. 4. No Groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 3.42m WS	Logger C. ALLEN
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Window Sampler

WS102

Sheet 1 of 1

Hole Type WS	Easting 345741.24	Northing 390022.83	Ground Level (m) 26.45	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.90 1.00	ES 1 SPT	N=8 (2,2/2,2,2,2)	26.25 25.75	0.20 0.20 (0.50) 0.70	 	MADE GROUND: Greyish brown sandy gravel. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and limestone. MADE GROUND: Brown sandy gravelly clay. Gravel is fine to coarse, angular to rounded of mudstone, sandstone, limestone, and brick. Loose reddish brown gravelly fine to coarse SAND. Gravel is fine to medium, subangular to subrounded of mudstone and sandstone.	0.5 1.0
		2.00	SPT	N=11 (2,2/3,2,3,3)	25.15	1.30 (1.70)		Stiff medium strength dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	1.5 2.0 2.5
		3.00	SPT	N=8 (1,1/2,2,2,2)	23.45	3.00 (0.40)	NR NR NR NR NR NR NR NR NR	No Recovery	3.0
		4.00 4.10	SPT ES 1	N=13 (3,3/3,4,3,3)	23.05 22.75	3.40 (0.30) 3.70 (0.30)	 NR NR NR NR NR NR	Firm dark brown sandy gravelly CLAY. Gravel is fine to medium, subangular to rounded of mudstone, sandstone, and coal. No Recovery	3.5 4.0
		4.70	SPT	N=50 for 270mm (11,13/13,15,14,8 for 45mm)	22.45	4.00 (1.12)		Stiff medium strength blackish brown sandy CLAY. Becoming very stiff high strength (4.70 - 5.12m)	4.5 5.0
					21.33	5.12		End of Borehole at 5.12m	5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0

Remarks 1. Refused at 5.12 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Water strike encountered from 2.00 m bgl, recorded as slow ingress.	Method, Plant, Stability, Dimensions 0.00 - 5.12m WS	Logger C. ALLEN
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Window Sampler

WS103
Sheet 1 of 1

Hole Type WS	Easting 345749.17	Northing 390062.51	Ground Level (m) 26.70	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.10	ES 1		26.40	(0.30) 0.30		MADE GROUND: Grey sandy gravel. Gravel is fine to coarse, subangular to subrounded of limestone.	
						(0.70)		MADE GROUND: Greyish brown sandy clayey gravel. Gravel is fine to coarse, subangular to rounded of mudstone, sandstone, brick, and timber.	0.5
		1.00	SPT	N=7 (1,1/1,2,2,2)	25.70	1.00		Firm low strength dark brown sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	1.0
						(0.60)			1.5
		2.00	SPT	N=16 (3,3/3,4,4,5)	25.10	1.60		Stiff medium strength brown sandy CLAY.	2.0
						(0.90)			2.5
		2.50-3.00	L 1		24.20	2.50		Very stiff very high strength brown slightly sandy CLAY.	2.5
						(0.93)			3.0
		3.00	SPT	N=50 for 280mm (7,9/10,14,14,12 for 55mm)	23.27	3.43			3.5
								End of Borehole at 3.43m	3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 3.43 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 3.00 m bgl. 4. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 3.43m WS	Logger C. ALLEN
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Window Sampler

WS104

Sheet 1 of 1

Hole Type WS	Easting 345794.56	Northing 390059.28	Ground Level (m) 27.23	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests		Level (m)	Depth (m)	Strata	
		Depth (m)	Type/ Ref			Legend	Description
		0.90	ES 1 SPT	27.03	(0.20)		MADE GROUND: Greyish brown sandy slightly clayey gravel with frequent rootlets. Gravel is fine to coarse, subangular to subrounded of brick, mudstone, and limestone. (Reworked topsoil).
		1.00		26.73	0.20		
					(0.30)		
			SPT ES 1		0.50		MADE GROUND: Brown sandy slightly gravelly clay. Gravel is fine to coarse, subangular to rounded of brick, mudstone, sandstone, and coal.
					(1.30)		
		2.00	SPT ES 1	25.43	1.80		Stiff medium strength dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.
		2.10			(0.60)		
			SPT	24.83	2.40		Very stiff very high strength brown sandy CLAY.
					(1.02)		
		3.00		23.81	3.42		End of Borehole at 3.42m

Remarks 1. Refused at 3.42 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 0.50 - 1.50 m bgl. 4. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 3.42m WS	Logger C. ALLEN
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Window Sampler

WS105
Sheet 1 of 1

Hole Type WS	Easting 345792.93	Northing 389993.78	Ground Level (m) 26.45	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.50	ES 1		26.35	(0.10)		MADE GROUND: Brown gravelly fine to coarse sand. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and limestone.	
		1.00	SPT	N=4 (1,1/1,1,1,1)	26.10	0.10 0.25 0.35		MADE GROUND: Grey slightly sandy gravel. Gravel is fine to coarse, angular to subrounded of limestone and concrete.	0.5
		2.00	SPT	N=20 (1,6/8,4,4,4)	25.15	(0.95)		MADE GROUND: Brown slightly sandy gravelly clay. Gravel is fine to coarse, angular to subrounded of mudstone, sandstone, coal, concrete, and brick.	1.0
		2.30	ES 1			1.30		Concrete cobble identified. (0.60 - 0.65m) Land drain identified. (1.10 - 1.30m)	1.5
		3.00	SPT	N=6 (1,2/2,1,1,2)		(1.70)		Very stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium, subangular to subrounded of mudstone, sandstone, and coal.	2.0
		4.00	SPT	N=18 (2,2/3,4,5,6)	23.45	3.00 (0.30)	NR NR NR NR NR NR	No Recovery	3.0
		4.70	SPT	N=50 for 160mm (10,13/14,17,19 for 10mm)	23.15	3.30		Loose brown clayey gravelly fine to medium SAND. Gravel is fine to medium, subangular to subrounded of mudstone, sandstone, and coal.	3.5
					22.45	4.00		Very stiff high strength brown slightly sandy CLAY.	4.0
						(1.01)		Becoming very stiff very high strength (4.70 - 5.01m)	4.5
					21.44	5.01		End of Borehole at 5.01m	5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 5.01 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 2.00 - 4.00 m bgl. 4. Water strike encountered from 2.00 m bgl, recorded as slow ingress	Method, Plant, Stability, Dimensions 0.00 - 5.01m WS	Logger C. ALLEN
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Window Sampler

WS106
Sheet 1 of 1

Hole Type WS	Easting 345844.02	Northing 390002.22	Ground Level (m) 26.96	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
					26.86	(0.10) 0.10		MADE GROUND: Dark brown gravelly fine to coarse sand with frequent rootlets. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and brick. (Reworked topsoil).	
						(0.90)		MADE GROUND: Greyish brown sandy gravel. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, limestone, and brick.	0.5
		1.00	SPT	N=20 (1,2/3,7,6,4)	25.96	1.00		Sandstone Cobble (0.70 - 0.75m)	1.0
		1.20	ES 1			(1.00)		MADE GROUND: Dark brown slightly sandy slightly gravelly clay. Gravel is fine to coarse, subangular to rounded of mudstone, sandstone, coal, and brick.	1.5
		2.00	SPT	N=5 (1,2/2,1,1,1)	24.96	2.00		Firm low strength dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	2.0
		2.10	ES 1			(0.70)		Firm greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	2.5
					24.26	2.70		Firm greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	3.0
		3.00	SPT	N=32 (4,4/4,5,9,14)	23.96	3.00		Very stiff high strength reddish brown sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	3.0
		3.30	SPT	N=50 for 40mm (25 for 55mm/50 for 40mm)	23.56	3.40		Very stiff high strength reddish brown sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	3.5
								Becoming very stiff very high strength (3.00 - 3.30m)	
								End of Borehole at 3.40m	4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 3.40 m bgl on SANDSTONE bedrock. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 2.00 m bgl. 4. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 3.40m WS	Logger C. ALLEN
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Window Sampler

WS107
Sheet 1 of 1

Hole Type WS	Easting 345796.73	Northing 389950.07	Ground Level (m) 26.39	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.50	ES 1		25.79	0.60 (0.60)		MADE GROUND: Greyish brown sandy gravel with frequent rootlets. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and limestone. (Reworked topsoil).	0.5
		1.00	SPT	N=5 (5,1/1,1,2,1)	25.39	1.00 (0.40)		MADE GROUND: Brown slightly sandy slightly gravelly clay. Gravel is fine to medium, subangular to subrounded of mudstone, sandstone, coal, and brick.	1.0
					24.99	1.40 (0.40)	NR NR NR NR NR NR NR NR NR	No Recovery	
		2.00	SPT	N=6 (2,1/2,2,1,1)	24.39	2.00 (0.60)		MADE GROUND: Yellowish brown slightly sandy gravelly clay. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, limestone, brick, and coal.	1.5
		2.50	ES 1					Firm low strength dark brown very sandy CLAY.	2.0
		3.00	SPT	N=9 (2,2/1,2,3,3)		(2.00)			3.0
		3.50-4.00	L 1						3.5
		4.00	SPT	N=50 for 290mm (5,6/12,15,16,7 for 65mm)	22.39	4.00 (0.44)		Very stiff very high strength dark brown slightly sandy CLAY.	4.0
					21.95	4.44		End of Borehole at 4.44m	4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 4.44 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 2.00 - 3.00 m bgl. 4. Water strike encountered from 2.50 m bgl, described as slow ingress.	Method, Plant, Stability, Dimensions 0.00 - 4.44m WS	Logger C. ALLEN
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Window Sampler

WS108
Sheet 1 of 1

Hole Type WS	Easting 345831.50	Northing 389918.02	Ground Level (m) 26.52	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
					26.42	(0.10) 0.10		MADE GROUND: Greyish brown sandy gravel with frequent rootlets. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, limestone, and concrete.	
		1.00	SPT	N=6 (1,1/1,1,2,2)		(1.90)		MADE GROUND: Dark brown slightly sandy gravelly clay. Gravel is fine to coarse, subangular to rounded of mudstone, sandstone, brick, and coal.	0.5
		1.60	ES 1						1.0
		2.00	SPT	N=7 (1,1/2,1,2,2)	24.52	2.00		Firm low strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	1.5
		3.00	SPT	N=12 (1,2/3,3,3,3)		(1.90)		Becoming stiff medium strength (3.00 - 3.90m)	2.0
		4.00 4.00	SPT ES 1	N=13 (1,2/3,3,4,3)	22.62	3.90		Stiff medium strength brown sandy CLAY.	2.5
		4.50-5.00	L 1			(1.55)			3.0
		5.00	SPT	N=41 (4,6/8,9,12,12)				Becoming very stiff very high strength (5.00 - 5.45m)	3.5
					21.07	5.45		End of Borehole at 5.45m	4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 5.45m WS	Logger C. ALLEN
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Window Sampler

WS109

Sheet 1 of 1

Hole Type WS	Easting 345807.69	Northing 389870.06	Ground Level (m) 26.68	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-16	End Date 2026-03-16

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.10	ES 1		26.38	(0.30) 0.30		MADE GROUND: Greyish brown sandy gravel. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, coal, concrete, and brick.	0.5
						(0.70)		MADE GROUND: Brown slightly sandy gravelly clay. Gravel is fine to coarse, angular to subrounded of mudstone, sandstone, coal, brick, and concrete.	1.0
		1.00	SPT	N=8 (1,1/2,2,2,2)	25.68	1.00		Stiff medium strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium, angular to subrounded of mudstone, sandstone, and coal.	1.5
		1.40	ES 1		25.08	(0.60) 1.60 (0.20)		COAL.	2.0
		2.00	SPT	N=20 (3,3/4,4,6,6)	24.88	1.80		Very stiff high strength yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, angular to rounded of mudstone and sandstone.	2.5
						(1.60)			3.0
		3.00	SPT	N=50 for 245mm (10,12/13,13,13,11 for 20mm)	23.28	3.40		Becoming very stiff very high strength (3.00 - 3.40m)	3.5
								End of Borehole at 3.40m	4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 3.40 m bgl on MUDSTONE bedrock. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 3.00 m bgl. 4. No groundwater encountered	Method, Plant, Stability, Dimensions 0.00 - 3.40m WS	Logger C. ALLEN
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Window Sampler

WS110
Sheet 1 of 1

Hole Type WS	Easting 345726.66	Northing 389845.02	Ground Level (m) 27.17	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.10	ES 1	N=9 (1,1/2,2,2,3)	26.97	(0.20) 0.20		MADE GROUND: Grey gravelly fine to medium sand. Gravel is fine to medium, subangular to subrounded of mudstone, sandstone, and limestone.	
						(0.60)		MADE GROUND: Brown slightly sandy gravelly clay. Gravel is fine to coarse, subangular to rounded of mudstone, sandstone, coal, and brick.	0.5
		1.00	SPT		26.37	0.80 (0.20)			
		1.20	ES 1		26.17	1.00		Firm brown slightly sandy CLAY.	1.0
				N=50 for 80mm (16,9/35,15 for 5mm)	25.87	(0.30) 1.30		Loose brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to rounded of mudstone and sandstone.	1.5
						(0.60)		Firm orangish brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subrounded of mudstone and sandstone.	
		2.00	SPT		25.27	1.90 (0.31)		Dense weathered MUDSTONE.	2.0
					24.96	2.21			
								End of Borehole at 2.21m	
									2.5
									3.0
									3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 2.21 m bgl on MUDSTONE bedrock. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 2.00 m bgl. 4. No Groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 2.21m WS	Logger C. ALLEN
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Window Sampler

WS111

Sheet 1 of 1

Hole Type WS	Easting 345678.53	Northing 389905.80	Ground Level (m) 27.04	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		0.20	ES 1		26.99	(0.05) 0.05		Asphalt	
					26.74	(0.25) 0.30		MADE GROUND: Dark brown gravelly fine to coarse sand. Gravel is fine to coarse, subangular to subrounded of sandstone, coal, brick, and asphalt.	0.5
		0.90 1.00	ES 1 SPT	N=15 (2,3/3,4,4,4)	26.24	0.80		MADE GROUND: Brown slightly sandy slightly gravelly clay. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, coal, and brick.	1.0
						(0.90)		Very stiff high strength brown slightly sandy CLAY.	1.5
		2.00	SPT	N=50 for 210mm (11,13/13,17,20 for 60mm)	25.34	1.70		Dense weathered SANDSTONE.	2.0
					24.68	2.36		End of Borehole at 2.36m	2.5
									3.0
									3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 2.36 m bgl on SANDSTONE bedrock. 2. Easting/Northing and Ground Level determined from GPS. 3. Monitoring well installed with response zone from 1.00 - 2.00 m bgl. 4. No groundwater encountered	Method, Plant, Stability, Dimensions 0.00 - 2.36m WS	Logger C. ALLEN
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Window Sampler

WS112A
Sheet 1 of 1

Hole Type WS	Easting 345734.30	Northing 389965.48	Ground Level (m) 26.18	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		1.00	SPT	N=14 (4,4/3,4,4,3)	25.93	(0.25) 0.25		CONCRETE	
						(0.45)		MADE GROUND: Brown sandy gravelly clay. Gravel is fine to coarse, subangular to subrounded of mudstone, coal, concrete, and brick.	0.5
					25.48	0.70 (0.30)		Dark brown gravelly fine to coarse SAND. Gravel is fine to medium, subangular to rounded of mudstone and coal.	1.0
					25.18	1.00		Stiff medium strength yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium, sunagular to subrounded of mudstone, sandstone, and coal.	1.5
		2.00	SPT	N=20 (5,5/4,5,5,6)	(2.15)			Becoming very stiff high strength (2.00 - 2.80m)	2.0
									2.5
		2.80	SPT	N=50 for 200mm (10,14/14,16,20 for 50mm)				Becoming very stiff very high strength (2.80 - 3.15m)	3.0
									3.5
					23.03	3.15		End of Borehole at 3.15m	3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 3.15 m bgl on very stiff CLAY. 2. Easting/Northing and Ground Level determined from GPS 3. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 3.15m WS	Logger C. ALLEN
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Window Sampler

WS112B
Sheet 1 of 1

Hole Type WS	Easting 345743.00	Northing 389952.00	Ground Level (m)	Scale 1:50
Project Name Wilson Road	Project No. 18-824	Start Date 2026-03-17	End Date 2026-03-17	

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m) (thickness)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
						(0.30)	CONCRETE		
						0.30 (0.10) 0.40	CONCRETE	Concrete obstruction identified. (0.30 - 0.40m)	0.5
								End of Borehole at 0.40m	1.0
									1.5
									2.0
									2.5
									3.0
									3.5
									4.0
									4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0

Remarks 1. Refused at 0.40 m bgl due to concrete obstruction. 2. Easting/Northing determined from hand held device. 3. No groundwater encountered.	Method, Plant, Stability, Dimensions 0.00 - 0.40m WS	Logger C. ALLEN
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Open Hole Log

RB101

Sheet 1 of 4

Hole Type RO	Easting 345695.90	Northing 390034.35	Ground Level (m) 26.13	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-17	End Date 2026-03-17

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
													MADE GROUND: Greyish brown slightly clayey sandy gravel. Gravel is fine to coarse, subangular to subrounded of ash, concrete, and brick.	0.5
											(1.70)			1.0
														1.5
										24.43	1.70		Greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	2.0
											(1.40)			2.5
										23.03	3.10		Grey MUDSTONE.	3.0
											(0.70)			3.5
										22.33	3.80		COAL.	4.0
											(1.10)			4.5
										21.23	4.90		Dark grey MUDSTONE.	5.0
											(0.60)			
										20.63	5.50		Light grey MUDSTONE with sandstone bands.	5.5
														6.0
														6.5
														7.0
														7.5
											(4.30)			8.0
														8.5
														9.0
														9.5
										16.33	9.80 (4.30)			10.0

Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.80-4.90m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB101
Sheet 2 of 4

Hole Type RO	Easting 345695.90	Northing 390034.35	Ground Level (m) 26.13	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-17	End Date 2026-03-17

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
													Dark grey MUDSTONE.	10.5
														11.0
														11.5
														12.0
														12.5
														13.0
														13.5
														14.0
										12.03	14.10		Grey SANDSTONE with mudstone bands.	14.5
														15.0
														15.5
														16.0
														16.5
											(7.50)			17.0
														17.5
														18.0
														18.5
														19.0
														19.5
														20.0
Continued on next page														

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.80-4.90m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB101

Sheet 3 of 4

Hole Type RO	Easting 345695.90	Northing 390034.35	Ground Level (m) 26.13	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-17	End Date 2026-03-17

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
													As previous page.	20.5
														21.0
										4.53	21.60			21.5
													Grey MUDSTONE.	22.0
														22.5
														23.0
														23.5
														24.0
														24.5
														25.0
														25.5
											(8.90)			26.0
														26.5
														27.0
														27.5
														28.0
														28.5
														29.0
														29.5
														30.0
Continued on next page														

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.80-4.90m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB101
Sheet 4 of 4

Hole Type RO	Easting 345695.90	Northing 390034.35	Ground Level (m) 26.13	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-17	End Date 2026-03-17

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
													As previous page.	
										-4.37	30.50		Light grey SANDSTONE with siltstone bands.	30.5
											(2.10)			31.0
														31.5
														32.0
										-6.47	32.60		Grey MUDSTONE with sandstone bands.	32.5
														33.0
														33.5
														34.0
														34.5
														35.0
														35.5
											(7.40)			36.0
														36.5
														37.0
														37.5
														38.0
														38.5
														39.0
														39.5
										-13.87	40.00		End of Borehole at 40.00m	40.0

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.80-4.90m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB102

Sheet 1 of 4

Hole Type RO	Easting 345766.01	Northing 390006.03	Ground Level (m) 26.52	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
										26.32	(0.20) 0.20		CONCRETE
											(1.40)		MADE GROUND: Greyish brown slightly clayey sandy gravel. Gravel is fine to coarse, subangular to subrounded of ash, concrete, and brick.
										24.92	1.60		Greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.
										23.52	3.00		COAL.
										22.92	3.60		Black MUDSTONE and COAL.
										22.42	4.10		Grey SANDSTONE.
										21.22	5.30		Red SANDSTONE.
										18.02	8.50		Grey SANDSTONE.
										17.32	9.20		Red SANDSTONE.
											(3.20)		
													Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.00-3.60m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB102

Sheet 2 of 4

Hole Type RO	Easting 345766.01	Northing 390006.03	Ground Level (m) 26.52	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
										12.42	14.10 (0.20) 14.30		Grey SANDSTONE.
										12.22	14.30		COAL.
											(1.00)		
										11.22	15.30		Black MUDSTONE and COAL.
											(0.60)		
										10.62	15.90		Grey SANDSTONE with mudstone bands.
											(2.60)		
										8.02	18.50		Dark grey MUDSTONE.
											(1.50)		
										6.52	20.00		

Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.00-3.60m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB102
Sheet 3 of 4

Hole Type RO	Easting 345766.01	Northing 390006.03	Ground Level (m) 26.52	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
											(1.10)		Black MUDSTONE and COAL.	20.5
											5.42	21.10	Grey MUDSTONE with sandstone bands.	21.0
														21.5
														22.0
														22.5
														23.0
														23.5
														24.0
														24.5
														25.0
														25.5
														26.0
														26.5
														27.0
														27.5
														28.0
														28.5
														29.0
														29.5
														30.0
Continued on next page														

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.00-3.60m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB102
Sheet 4 of 4

Hole Type RO	Easting 345766.01	Northing 390006.03	Ground Level (m) 26.52	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth m (thickness)	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
										-13.48	40.00		End of Borehole at 40.00m

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 3.00-3.60m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB103

Sheet 1 of 4

Hole Type RO	Easting 345821.88	Northing 389959.13	Ground Level (m) 26.50	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
										26.30	(0.20) 0.20		MADE GROUND: Greyish brown slightly clayey sandy gravel. Gravel is fine to coarse, subangular to subrounded of ash, concrete, limestone, and brick.	0.5
													MADE GROUND: Blackish brown sandy gravel. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, coal, brick, ash, and limestone.	1.0
														1.5
														2.0
														2.5
														3.0
														3.5
														4.0
														4.5
														5.0
										21.10	5.40		Grey and Red SANDSTONE.	5.5
														6.0
														6.5
														7.0
														7.5
														8.0
														8.5
														9.0
														9.5
														10.0

Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. No intact coal seams encountered. 5. Intermittent loss of flush from 14.20m bgl onwards due to fractured bedrock.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB103

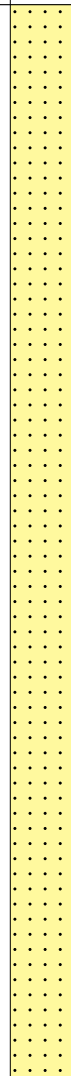
Sheet 2 of 4

Hole Type RO	Easting 345821.88	Northing 389959.13	Ground Level (m) 26.50	Scale 1:50
Project Name Wilson Road		Project No. 18-824	Start Date 2026-03-19	End Date 2026-03-19

Client
DJL Construction NW Ltd

Consultant
E3P

Contractor
DP Drilling/PM Sampling

Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level	Depth (thickness)	Strata				
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description			
													As previous page.			
															10.5	
															11.0	
															11.5	
															12.0	
															12.5	
															13.0	
															13.5	
															14.0	
															14.5	
															15.0	
															15.5	
															16.0	
															16.5	
															17.0	
										9.30	17.20			Grey MUDSTONE with coal traces.	17.5	
																18.0
																18.5
											(5.20)					19.0
														19.5		
														20.0		
													Continued on next page			

Remarks

Remarks

1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. No intact coal seams encountered. 5. Intermittent loss of flush from 14.20m bgl onwards due to fractured bedrock.

Method, Plant, Stability, Dimensions
0.00 - 40.00m RO

Logger
C. ALLEN



Open Hole Log

RB103
Sheet 3 of 4

Hole Type RO	Easting 345821.88	Northing 389959.13	Ground Level (m) 26.50	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
-----------------------------------	-------------------	---------------------------------------

Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
													20.5
													21.0
													21.5
													22.0
										4.10	22.40		Grey MUDSTONE with sandstone bands.
													22.5
													23.0
													23.5
													24.0
													24.5
													25.0
													25.5
											(6.90)		26.0
													26.5
													27.0
													27.5
													28.0
													28.5
										-2.80	29.30		Grey MUDSTONE with darker sandstone bands.
											(10.70)		29.5
													30.0

Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. No intact coal seams encountered. 5. Intermittent loss of flush from 14.20m bgl onwards due to fractured bedrock.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB103
Sheet 4 of 4

Hole Type RO	Easting 345821.88	Northing 389959.13	Ground Level (m) 26.50	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-19	End Date 2026-03-19

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
-----------------------------------	-------------------	---------------------------------------

Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth m (thickness)	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
										-13.50	40.00		End of Borehole at 40.00m

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. No intact coal seams encountered. 5. Intermittent loss of flush from 14.20m bgl onwards due to fractured bedrock.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Hole Type RO	Easting 345773.48	Northing 389861.41	Ground Level (m) 26.83	Scale 1:50
Project Name Wilson Road		Project No. 18-824	Start Date 2026-03-18	End Date 2026-03-18

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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[illegible]

Continued on next page

Remarks

Remarks
1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 3. No intact coal seams encountered. 4. Broken ground recorded 6.40-6.80m bgl with voided ground with total loss of flush encountered 6.80-12.90m bgl. 5. Potential steel encountered at end of voided ground at 12.80 m bgl.

Method, Plant, Stability, Dimensions

Method, Plant, Soil	
0.00 - 40.00m RO	

Logger	
--------	--

Logger
C. ALLEN

Hole Type RO	Easting 345773.48	Northing 389861.41	Ground Level (m) 26.83	Scale 1:50
Project Name Wilson Road		Project No. 18-824	Start Date 2026-03-18	End Date 2026-03-18

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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[illegible]

Continued on next page

Remarks

Remarks
1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 3. No intact coal seams encountered. 4. Broken ground recorded 6.40-6.80m bgl with voided ground with total loss of flush encountred 6.80-12.90m bgl. 5. Potential steel encountered at end of voided ground at 12.80 m bgl.

Method, Plant, Stability, Dimensions
0.00 - 40.00m RO

Logger
C. ALLEN



Open Hole Log

RB104
Sheet 3 of 4

Hole Type RO	Easting 345773.48	Northing 389861.41	Ground Level (m) 26.83	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-18	End Date 2026-03-18

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth m (thickness)	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 3. No intact coal seams encountered. 4. Broken ground recorded 6.40-6.80m bgl with voided ground with total loss of flush encountered 6.80-12.90m bgl. 5. Potential steel encountered at end of voided ground at 12.80 m bgl.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB104
Sheet 4 of 4

Hole Type RO	Easting 345773.48	Northing 389861.41	Ground Level (m) 26.83	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-18	End Date 2026-03-18

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth m (thickness)	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
										-13.17	40.00		End of Borehole at 40.00m

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 3. No intact coal seams encountered. 4. Broken ground recorded 6.40-6.80m bgl with voided ground with total loss of flush encountered 6.80-12.90m bgl. 5. Potential steel encountered at end of voided ground at 12.80 m bgl.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB105

Sheet 1 of 4

Hole Type RO	Easting 345675.96	Northing 389943.12	Ground Level (m) 26.15	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-16	End Date 2026-03-16

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
-----------------------------------	-------------------	---------------------------------------

Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata		
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description	
											(0.25)		CONCRETE	
										25.90	0.25		MADE GROUND: Greyish brown slightly clayey sandy gravel. Gravel is fine to coarse, subangular to subrounded of ash, concrete, limestone, and brick.	0.5
										25.65	0.50		Greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone, sandstone, and coal.	1.0
											(1.80)			1.5
														2.0
										23.85	2.30		Yellowish brown SANDSTONE.	2.5
											(0.70)			
										23.15	3.00		Grey SANDSTONE.	3.0
														3.5
														4.0
											(3.00)			4.5
														5.0
														5.5
														6.0
										20.15	6.00		Dark grey MUDSTONE.	
										19.95	6.20		COAL.	6.5
											(0.80)			7.0
										19.15	7.00		Blackish grey MUDSTONE.	7.5
											(0.60)			
										18.55	7.60		Shaley COAL.	8.0
											(0.90)			8.5
										17.65	8.50		Light grey MUDSTONE.	9.0
											(2.10)			9.5
														10.0

Continued on next page

Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 6.20-7.00m bgl, 7.60-8.50m bgl, 15.10-15.70m bgl, and 21.40-22.30m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Open Hole Log

RB105

Sheet 3 of 4

Hole Type RO	Easting 345675.96	Northing 389943.12	Ground Level (m) 26.15	Scale 1:50
Project Name Wilson Road	Project No. 18-824		Start Date 2026-03-16	End Date 2026-03-16

Client DJL Construction NW Ltd	Consultant E3P	Contractor DP Drilling/PM Sampling
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Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level m	Depth (thickness) m	Strata	
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description
													As previous page.
													20.5
													21.0
										4.75	21.40 (0.40)		Shaley COAL with mudstone.
										4.35	21.80 (0.50)		COAL.
										3.85	22.30		Grey MUDSTONE.
													22.5
													23.0
											(1.80)		23.5
													24.0
										2.05	24.10		Light grey MUDSTONE with sandstone bands.
													24.5
													25.0
													25.5
													26.0
													26.5
													27.0
													27.5
													28.0
													28.5
													29.0
										-3.45	29.60 (3.60)		Dark grey SANDSTONE.
													29.5
													30.0

Continued on next page

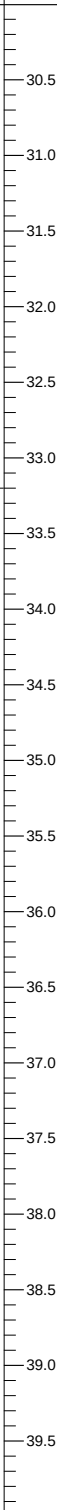
Remarks 1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 6.20-7.00m bgl, 7.60-8.50m bgl, 15.10-15.70m bgl, and 21.40-22.30m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.	Method, Plant, Stability, Dimensions 0.00 - 40.00m RO	Logger C. ALLEN
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Hole Type RO	Easting 345675.96	Northing 389943.12	Ground Level (m) 26.15	Scale 1:50
Project Name Wilson Road		Project No. 18-824	Start Date 2026-03-16	End Date 2026-03-16

Client
DJL Construction NW Ltd

Consultant
E3P

Contractor
DP Drilling/PM Sampling

Inst/ Backfill	Water Levels	Samples and Tests			Coring				Frac	Level	Depth (thickness)	Strata				
		Depth (m)	Type/ Ref	Results	Core Run	TCR (%)	SCR (%)	RQD (%)				Legend	Description			
													As previous page.			
														Grey MUDSTONE with sandstone bands.		
						</										

Remarks

1. Complete. 2. Easting/Northing and Ground Level determined from GPS. 3. No groundwater encountered. 4. Intact Coal seam encountered at 6.20-7.00m bgl, 7.60-8.50m bgl, 15.10-15.70m bgl, and 21.40-22.30m bgl. 5. No loss of flush, voided, or broken ground encountered during drilling.

Method, Plant, Stability, Dimensions
0.00 - 40.00m RO

Logger
C. ALLEN

Appendix VII: Chemical Testing Results



e3p
Taylor Road
Urmston
Manchester

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

t:
e: ndawson@e3p.co.uk

t: 01923 225404
f: 01923 237404
e: info-i2analytical@normecgroup.com

Analytical Report Number : 26-014938

Replaces Analytical Report Number: 26-014938, issue no. 1
Additional analysis undertaken.
Asbestos Quantification added to samples 867317, 20 & 25 as per client's request.

Project / Site name:	Wilson Road Huyton	Samples received on:	18/03/2026
Your job number:	18-824	Samples instructed on/ Analysis started on:	23/03/2026
Your order number:	13842	Analysis completed by:	15/04/2026
Report Issue Number:	2	Report issued on:	16/04/2026
Samples Analysed:	11 soil samples - 3 leachate samples		



Signed:

Trevor Hill
Customer Service
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: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number	867315	867316	867317	867318	867319
Sample Reference	WS101	WS101	WS103	WS104	WS106
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)	0.80	1.10	0.10	0.90	1.20
Date Sampled	17/03/2026	17/03/2026	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Mass of stone >10mm	%	0.1	NONE	< 0.1	< 0.1	13	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	14	3.9	14	12
Total mass of sample received	kg	0.1	NONE	0.2	0.8	1.4	0.8	1.2
Whole Sample Crushed	N/A	N/A	NONE	-	-	-	-	-

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	Detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	WIK	-	WIK	WIK	WIK
Analysis completed	N/A	N/A	N/A	28/03/2026	-	28/03/2026	28/03/2026	28/03/2026
Actinolite detected	Type	N/A	ISO 17025	-	-	Not-detected	-	-
Amosite detected	Type	N/A	ISO 17025	-	-	Detected	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	-	Not-detected	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	-	Not-detected	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	-	Not-detected	-	-
Tremolite detected	Type	N/A	ISO 17025	-	-	Not-detected	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-	< 0.001	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-	Loose Fibres	-	-
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.5	7.9	11.6	8	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	96	55	230	330	88
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	48.2	27.4	113	164	44
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2	0.4	0.5	1.1	0.3

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	0.06	0.68
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.56
Phenanthrene	mg/kg	0.05	MCERTS	0.33	< 0.05	0.12	0.85	3.3
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.1	0.75
Fluoranthene	mg/kg	0.05	MCERTS	0.51	< 0.05	0.26	1.6	3.1
Pyrene	mg/kg	0.05	MCERTS	0.49	< 0.05	0.3	1.5	2.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.36	< 0.05	0.26	0.59	1.1
Chrysene	mg/kg	0.05	MCERTS	0.38	< 0.05	0.25	0.81	1.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.41	< 0.05	0.37	0.91	1.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.11	< 0.05	0.12	0.37	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	< 0.05	0.33	0.74	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.18	0.42	0.51
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.07	0.12	0.11
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.19	< 0.05	0.32	0.55	0.63

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number	867315	867316	867317	867318	867319
Sample Reference	WS101	WS101	WS103	WS104	WS106
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)	0.80	1.10	0.10	0.90	1.20
Date Sampled	17/03/2026	17/03/2026	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.26	< 0.80	2.58	8.62	17.4
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	6.5	6.8	15	7.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	U/S ^{mg U/S g}	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (hexavalent) by IC	mg/kg	1.8	NONE	< 1.80	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	38	15	23	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	38	17	13	30	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	53	8.1	55	59	22
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	31	32	13	22	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.8	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	38	330	98	47

Petroleum Hydrocarbons

TPH (>EC5 - EC10) _{HS_1D_TOTAL}	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC5 - EC6) _{HS_1D_TOTAL}	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (>EC6 - EC8) _{HS_1D_TOTAL}	mg/kg	0.01	MCERTS	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
TPH (>EC8 - EC10) _{HS_1D_TOTAL}	mg/kg	0.02	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TPH (>EC10 - EC12) _{EH_CU_1D_TOTAL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (>EC12 - EC16) _{EH_CU_1D_TOTAL}	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	4.5
TPH (>EC16 - EC21) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	21	17	10
TPH (>EC21 - EC35) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	80	110	18
TPH (>EC35 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	36	33	< 10

TPH Total >EC5 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	< 10	< 10	140	160	33
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TPH (EC10 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	140	160	33
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number	867320	867321	867322	867323	867324
Sample Reference	WS107	WS109	WS109	WS110	WS111
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)	0.50	0.10	1.40	0.10	0.90
Date Sampled	17/03/2026	17/03/2026	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Mass of stone >10mm	%	0.1	NONE	2.2	80.6	< 0.1	71.4	25.7
Moisture Content	%	0.01	NONE	13	7.2	14	5.8	11
Total mass of sample received	kg	0.1	NONE	0.7	1.4	1	0.7	1
Whole Sample Crushed	N/A	N/A	NONE	-	Crushed	-	Crushed	-

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected	Not-detected	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	WIK	KMC	-	KMC	-
Analysis completed	N/A	N/A	N/A	28/03/2026	28/03/2026	-	28/03/2026	-
Actinolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Amosite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Chrysotile detected	Type	N/A	ISO 17025	Detected	-	-	-	-
Crocidolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Tremolite detected	Type	N/A	ISO 17025	Not-detected	-	-	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	< 0.001	-	-	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Loose Fibres	-	-	-	-
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8	11.5	5.4	9.6	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	380	160	140	89	51
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	189	80.6	71.9	44.7	25.3
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.1	0.9	1.9	0.5	0.2

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	0.36	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.4	< 0.05	0.34	0.14	0.08
Anthracene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.7	< 0.05	0.09	0.06	0.51
Pyrene	mg/kg	0.05	MCERTS	1.8	< 0.05	0.13	0.06	0.57
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.76	< 0.05	0.08	< 0.05	0.32
Chrysene	mg/kg	0.05	MCERTS	0.95	< 0.05	0.11	< 0.05	0.37
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.94	< 0.05	< 0.05	< 0.05	0.43
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.41	< 0.05	< 0.05	< 0.05	0.17
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.82	< 0.05	< 0.05	< 0.05	0.43
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05	< 0.05	0.19
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	0.57	< 0.05	< 0.05	< 0.05	0.23

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number	867320	867321	867322	867323	867324
Sample Reference	WS107	WS109	WS109	WS110	WS111
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)	0.50	0.10	1.40	0.10	0.90
Date Sampled	17/03/2026	17/03/2026	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	10.7	< 0.80	< 0.80	< 0.80	3.37
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	4.2	7.6	3.9	4.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	U/S [†] U/S ^g	< 1.8	< 1.8
Chromium (hexavalent) by IC	mg/kg	1.8	NONE	-	-	< 1.80	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	35	25	23	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	36	14	31	18	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	65	13	7.1	7.3
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	24	16	20	26	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.5	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	49	28	52	31

Petroleum Hydrocarbons

TPH (>EC5 - EC10) _{HS_1D_TOTAL}	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC5 - EC6) _{HS_1D_TOTAL}	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (>EC6 - EC8) _{HS_1D_TOTAL}	mg/kg	0.01	MCERTS	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
TPH (>EC8 - EC10) _{HS_1D_TOTAL}	mg/kg	0.02	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TPH (>EC10 - EC12) _{EH_CU_1D_TOTAL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (>EC12 - EC16) _{EH_CU_1D_TOTAL}	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (>EC16 - EC21) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH (>EC21 - EC35) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH (>EC35 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH Total >EC5 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	10	< 10	< 10	< 10	< 10
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TPH (EC10 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	10	< 10	< 10	< 10	< 10
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number				867325
Sample Reference				WS112
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.30
Date Sampled				17/03/2026
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Mass of stone >10mm	%	0.1	NONE	0.8
Moisture Content	%	0.01	NONE	16
Total mass of sample received	kg	0.1	NONE	0.8
Whole Sample Crushed	N/A	N/A	NONE	-

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected
Asbestos Analyst ID	N/A	N/A	N/A	KMC
Analysis completed	N/A	N/A	N/A	28/03/2026
Actinolite detected	Type	N/A	ISO 17025	Not-detected
Amosite detected	Type	N/A	ISO 17025	Not-detected
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	Detected
Crocidolite detected	Type	N/A	ISO 17025	Not-detected
Tremolite detected	Type	N/A	ISO 17025	Not-detected

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	0.069
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Asbestos Cement, Loose Fibres
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	80
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	40
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.7

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	0.1
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.5
Anthracene	mg/kg	0.05	MCERTS	0.4
Fluoranthene	mg/kg	0.05	MCERTS	3.8
Pyrene	mg/kg	0.05	MCERTS	6.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.5
Chrysene	mg/kg	0.05	MCERTS	3.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.5
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.1

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton
Your Order No: 13842

Lab Sample Number	867325			
Sample Reference	WS112			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.30			
Date Sampled	17/03/2026			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	32.1
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (hexavalent) by IC	mg/kg	1.8	NONE	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	52
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	470

Petroleum Hydrocarbons

TPH (>EC5 - EC10) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0
TPH (>EC5 - EC6) HS_1D_TOTAL	mg/kg	0.1	NONE	< 0.1
TPH (>EC6 - EC8) HS_1D_TOTAL	mg/kg	0.01	MCERTS	< 0.01
TPH (>EC8 - EC10) HS_1D_TOTAL	mg/kg	0.02	MCERTS	< 0.02
TPH (>EC10 - EC12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0
TPH (>EC12 - EC16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0
TPH (>EC16 - EC21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	33
TPH (>EC21 - EC35) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	660
TPH (>EC35 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	350

TPH Total >EC5 - EC40 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	1000
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TPH (EC10 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	1000
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: **26-014938**
Project / Site name: **Wilson Road Huyton**
Your Order No: **13842**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample	Analysis completed	Analyst ID
867317	WS103	0.1	147	Loose Fibres	Amosite	< 0.001	< 0.001	15/04/2026	WIK
867320	WS107	0.5	174	Loose Fibres	Chrysotile	< 0.001	< 0.001	15/04/2026	WIK
867325	WS112	0.3	158	Asbestos Cement, Loose Fibres	Chrysotile	0.069	0.069	15/04/2026	KMC

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

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton

Your Order No: 13842

Lab Sample Number	867317	867319	867321
Sample Reference	WS103	WS106	WS109
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	0.10	1.20	0.10
Date Sampled	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	10.4	7.7	7.8
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	8.9	< 1.0

Total Phenols

Total Phenols (monohydric) low level	µg/l	1	NONE	1.5	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	0.04	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	0.03	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	0.09	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01

Total PAH

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

Arsenic (dissolved)	µg/l	1	ISO 17025	1.9	2.9	< 1.0
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.3	< 0.4	3.1
Copper (dissolved)	µg/l	0.7	ISO 17025	14	3.9	9.9
Lead (dissolved)	µg/l	1	ISO 17025	5.9	2.2	7.7
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.4	< 0.3	1.8
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	12	15	9.2

Petroleum Hydrocarbons

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

Analytical Report Number: 26-014938
Project / Site name: Wilson Road Huyton

Your Order No: 13842

Lab Sample Number	867317	867319	867321
Sample Reference	WS103	WS106	WS109
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	0.10	1.20	0.10
Date Sampled	17/03/2026	17/03/2026	17/03/2026
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status

TPH - Aromatic >EC5 - EC7 _{HS_ID_AR}	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_ID_AR}	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{EH_ID_AR_MS}	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC12 - EC16 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC16 - EC21 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC6 - EC35 _{HS+EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10

TPH (EC10 - EC40) _{EH_ID_TOTAL_MS}	µg/l	10	NONE	< 10	< 10	< 10
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VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Benzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0

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

Analytical Report Number : 26-014938

Project / Site name: Wilson Road Huyton

* 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 *
867315	WS101	None Supplied	0.8	Brown clay and loam with gravel
867316	WS101	None Supplied	1.1	Brown clay and sand with gravel
867317	WS103	None Supplied	0.1	Brown sand with gravel and stones
867318	WS104	None Supplied	0.9	Brown loam and sand with gravel and brick
867319	WS106	None Supplied	1.2	Brown clay and sand with gravel and vegetation
867320	WS107	None Supplied	0.5	Brown loam and sand with vegetation and stones
867321	WS109	None Supplied	0.1	Brown clay and gravel with brick and stones
867322	WS109	None Supplied	1.4	Brown clay and sand with gravel and vegetation
867323	WS110	None Supplied	0.1	Brown clay and gravel with vegetation and stones
867324	WS111	None Supplied	0.9	Brown clay and sand with stones
867325	WS112	None Supplied	0.3	Brown clay and sand with gravel and stones

Analytical Report Number : 26-014938

Project / Site name: Wilson Road Huyton

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
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 (Wet Weight)	Moisture content (% wet weight), determined gravimetrically (up to 30°C)	In-house-procedure based on BS EN 12880:2000	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
Hexavalent chromium in soil by Ion Chromatography	Determination of hexavalent chromium in alkaline soil extract by use of ion chromatography with spectrophotometric detection	In-house method	L130B	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
Total petroleum hydrocarbons by GC-FID in soil	Determination of total petroleum hydrocarbons in soil by GC-FID	In-house method	L076B	D	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil (Summed Bands)	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS (Summed Bands).	Calculation	L076B/L088-PL	D/W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total petroleum hydrocarbons by HS-GC-MS in soil	Determination of total petroleum hydrocarbons in soil by HS-GC/MS	In-house method	L088-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

Analytical Report Number : 26-014938

Project / Site name: Wilson Road Huyton

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 Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in leachate	Determination of total petroleum hydrocarbons in leachate by GC-MS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
Total petroleum hydrocarbons with carbon banding by GC-MS/GC-MS HS in leachate (Summed Bands)	Determination of total petroleum hydrocarbons in leachate by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands).	Calculation	L070B/L088-PL	W	NONE
Total petroleum hydrocarbons by GC-MS in leachate	Determination of total petroleum hydrocarbons in leachate by GC-MS	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	ISO 17025
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total petroleum hydrocarbons with carbon banding by HS-GC/MS in leachate	Determination of total petroleum hydrocarbons in leachate by HS-GC/MS with carbon banding aliphatic and aromatic	In-house method	L088-PL	W	NONE
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		NONE
NRA Leachate 10:1		In-house method based on interim NRA guidance (1994)	L020B	W	NONE

Analytical Report Number : 26-014938
Project / Site name: Wilson Road Huyton

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
Whole Sample Crushed	Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis	In house method, applicable to dry samples only	L019B	D	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 30oC.

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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

The result for sum should be interpreted with caution

*U/S g- Unsuitable for analysis due to high colour intensity.



Sample Deviation Report



Normec
i2 Analytical

Analytical Report Number : 26-014938

Project / Site name: Wilson Road Huyton

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS101	None Supplied	S	867315	b	Asbestos identification in Soil	A001B	b



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Analytical Report Number : 26-017917

Replaces Analytical Report Number: 26-017917, issue no. 1
Client sampling date amended.

Project / Site name: Wilson Rd

Samples received on: 02/04/2026

Your job number: 18824

**Samples instructed on/
Analysis started on:** 08/04/2026

Your order number: 13953

Analysis completed by: 15/04/2026

Report Issue Number: 2

Report issued on: 18/05/2026

Samples Analysed: 1 water sample

Signed:

Adan Cazas Garcia
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: 26-017917
Project / Site name: Wilson Rd

Your Order No: 13953

Lab Sample Number				882072
Sample Reference				WS101
Sample Number				None Supplied
Water Matrix				Ground water
Depth (m)				None Supplied
Date Sampled				01/04/2026
Time Taken				None Supplied
Analytical Parameter (Water Analysis)		Units	Test Limit of detection	Test Accreditation Status

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.7
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	8.54

Total Phenols

Total Phenols (Monohydric) Low Level	µg/l	1	NONE	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	0.03
Anthracene	µg/l	0.01	ISO 17025	0.02
Fluoranthene	µg/l	0.01	ISO 17025	0.05
Pyrene	µg/l	0.01	ISO 17025	0.06
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0.03
Chrysene	µg/l	0.01	ISO 17025	0.03
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01



Analytical Report Number: 26-017917
Project / Site name: Wilson Rd

Your Order No: 13953

Lab Sample Number				882072
Sample Reference				WS101
Sample Number				None Supplied
Water Matrix				Ground water
Depth (m)				None Supplied
Date Sampled				01/04/2026
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	7.6
Lead (dissolved)	µg/l	0.2	ISO 17025	2.7
Manganese (dissolved)	µg/l	0.05	ISO 17025	590
Mercury (dissolved)	µg/l	0.05	NONE	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	9.3
Selenium (dissolved)	µg/l	0.6	ISO 17025	17
Zinc (dissolved)	µg/l	0.5	ISO 17025	6.6

Calcium (dissolved)	mg/l	0.012	ISO 17025	47
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	21
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	45
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	15
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	62
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	140

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	< 10

TPH (EC10 - EC40) _{EH_1D_TOTAL_MS}	µg/l	10	NONE	140
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VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0



4041

Analytical Report Number: 26-017917
Project / Site name: Wilson Rd

Your Order No: 13953

Lab Sample Number				882072
Sample Reference				WS101
Sample Number				None Supplied
Water Matrix				Ground water
Depth (m)				None Supplied
Date Sampled				01/04/2026
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status	
Chloroform	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	1	ISO 17025	< 1.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	1	ISO 17025	< 1.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0
Styrene	µg/l	3	ISO 17025	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	1	ISO 17025	< 1.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0



Analytical Report Number: 26-017917
Project / Site name: Wilson Rd

Your Order No: 13953

Lab Sample Number				882072
Sample Reference				WS101
Sample Number				None Supplied
Water Matrix				Ground water
Depth (m)				None Supplied
Date Sampled				01/04/2026
Time Taken				None Supplied
Analytical Parameter (Water Analysis)				
Units				
Test Limit of detection				
Test Accreditation Status				

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05

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

Analytical Report Number : 26-017917

Project / Site name: Wilson Rd

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	ISO 17025
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	ISO 17025
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
Total Petroleum Hydrocarbons with carbon banding in water by GC-MS/HS-GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS/HS-GC-MS with carbon banding aliphatic and aromatic (Summed Bands)	Calculation	L070B/L088-PL	W	NONE
Total Petroleum Hydrocarbons in water by GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS. Accredited matrices (TPH C12-C35): SW, PW, GW	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	ISO 17025
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	ISO 17025
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total cyanide (low level) in water	Determination of total cyanide in water by distillation followed by colorimetry	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 HS-GC/MS . Accredited matrices: SW, PW, GW	In-house method	L088-PL	W	ISO 17025
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	ISO 17025



Analytical Report Number : 26-017917
Project / Site name: Wilson Rd

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	ISO 17025
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	ISO 17025

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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



Analytical Report Number : 26-017917
Project / Site name: Wilson Rd
This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS101	N/A	W	882072	c	BTEX and/or Volatile Organic Compounds in water	L073B	c
WS101	N/A	W	882072	c	Dissolved Organic Carbon in water	L037B	c
WS101	N/A	W	882072	c	Hexavalent chromium in water	L080-PL	c
WS101	N/A	W	882072	c	Metals in water by ICP-MS (dissolved)	L012B	c
WS101	N/A	W	882072	c	Metals in water by ICP-OES (dissolved)	L039B	c
WS101	N/A	W	882072	c	Total Petroleum Hydrocarbons in water by HS-GC/MS	L088-PL	c
WS101	N/A	W	882072	c	Total cyanide (low level) in water	L080-PL	c
WS101	N/A	W	882072	c	pH of water at 20°C (automated)	L099-PL	c

Appendix VIII: Geotechnical Testing Results



TEST REPORT

Client e3p

Address Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contract Wilson Road, Huyton, Liverpool L36 6AE

Job Number MRN 26002/140
Date of Issue 30 April 2026
Page 1 of 13

Approved Signatories

S J Hutchings, O P Davies

Notes

- 1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
- 2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
- 3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
- 4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.
- 5 The results included within the report are representative of the samples submitted for analysis.
- 6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.



Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

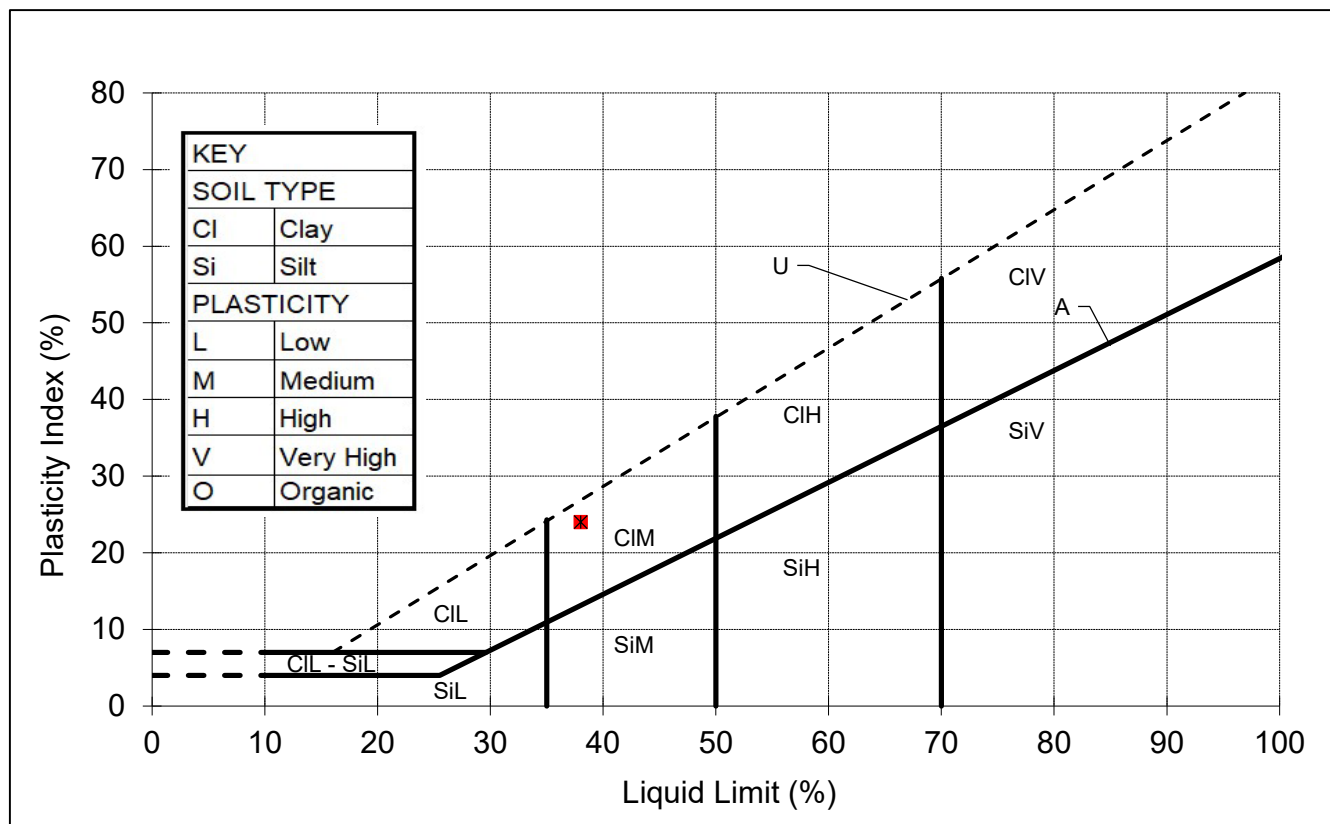
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS101 2.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062801	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19.0	38	14	24	95



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

30-Apr-26

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LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

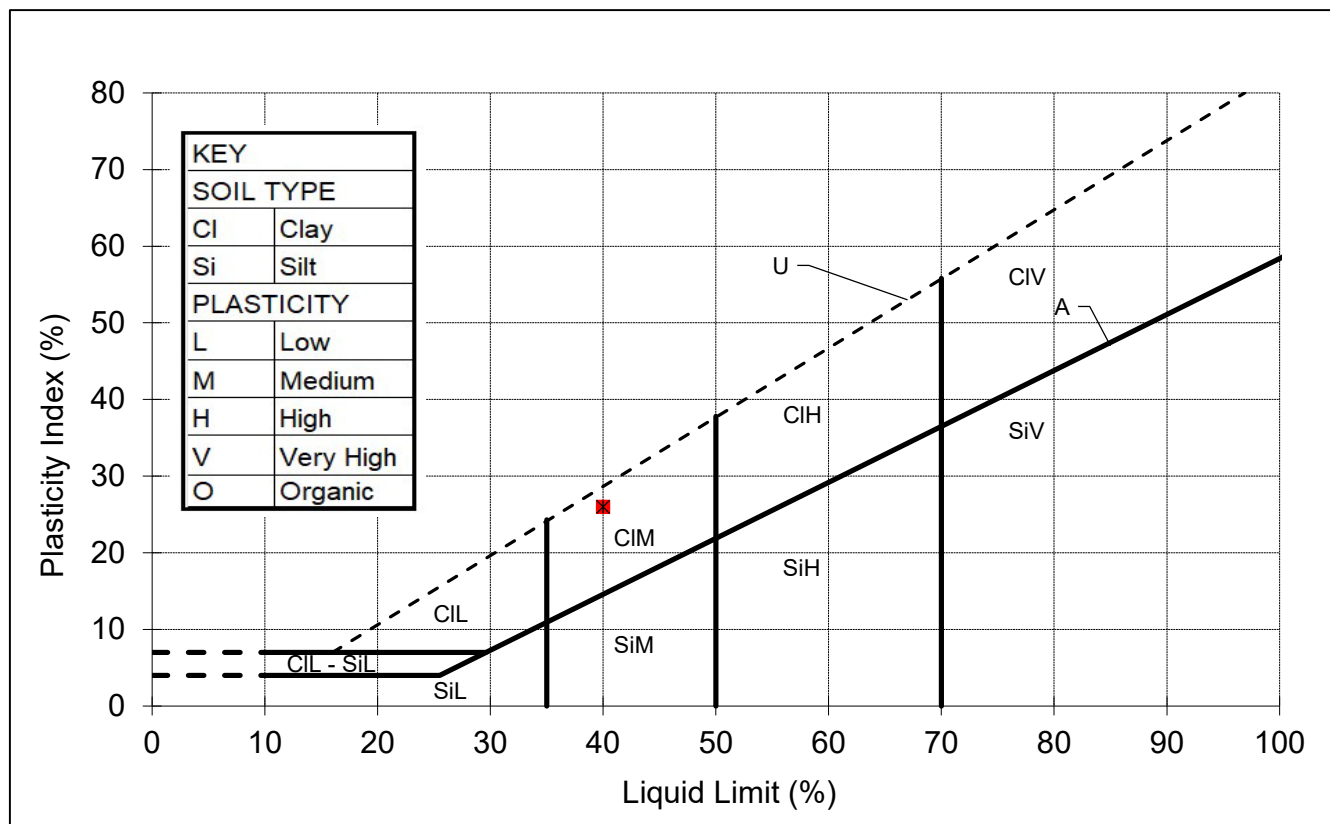
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS102 5.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062802	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17.1	40	14	26	85



REMARKS

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LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

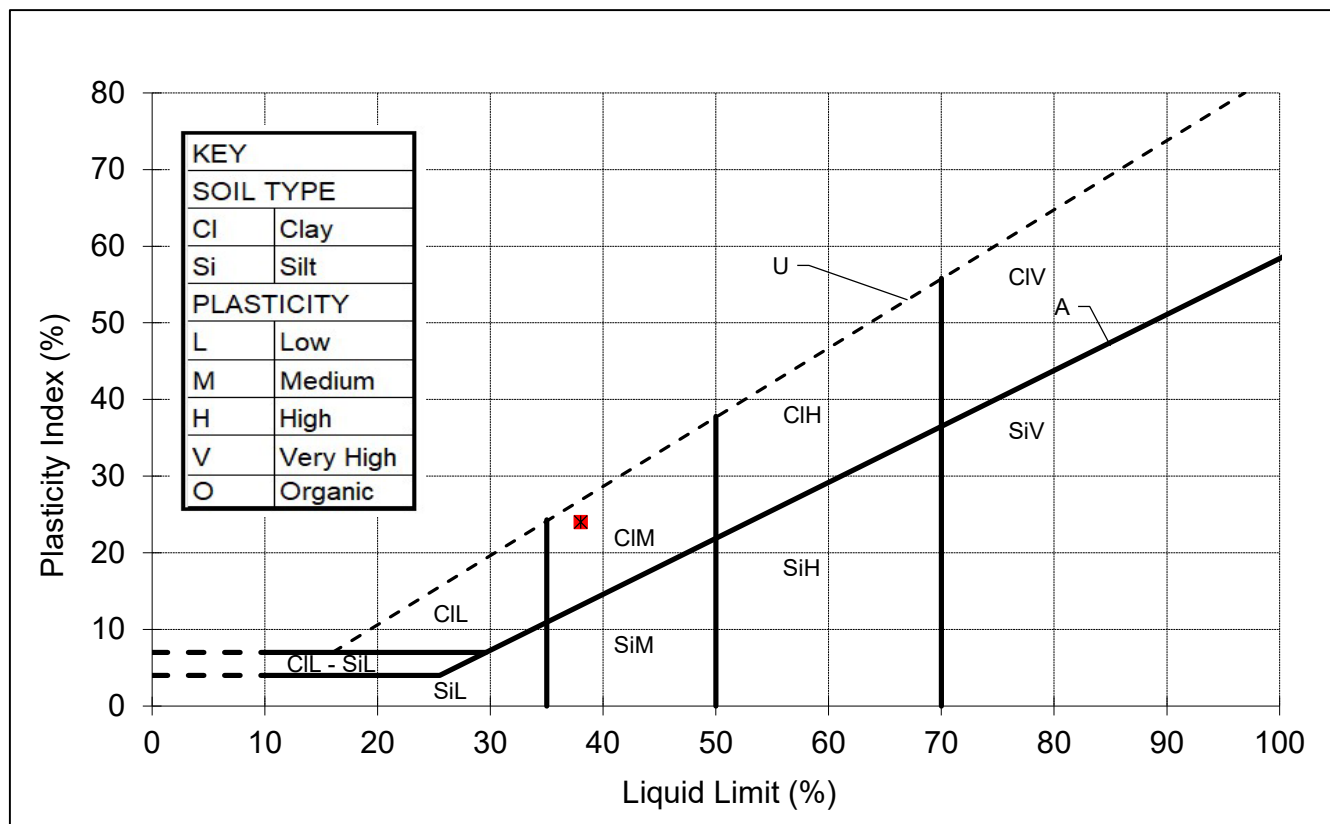
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS104 3.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062803	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Black brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14.5	38	14	24	96



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE 30-Apr-26

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LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

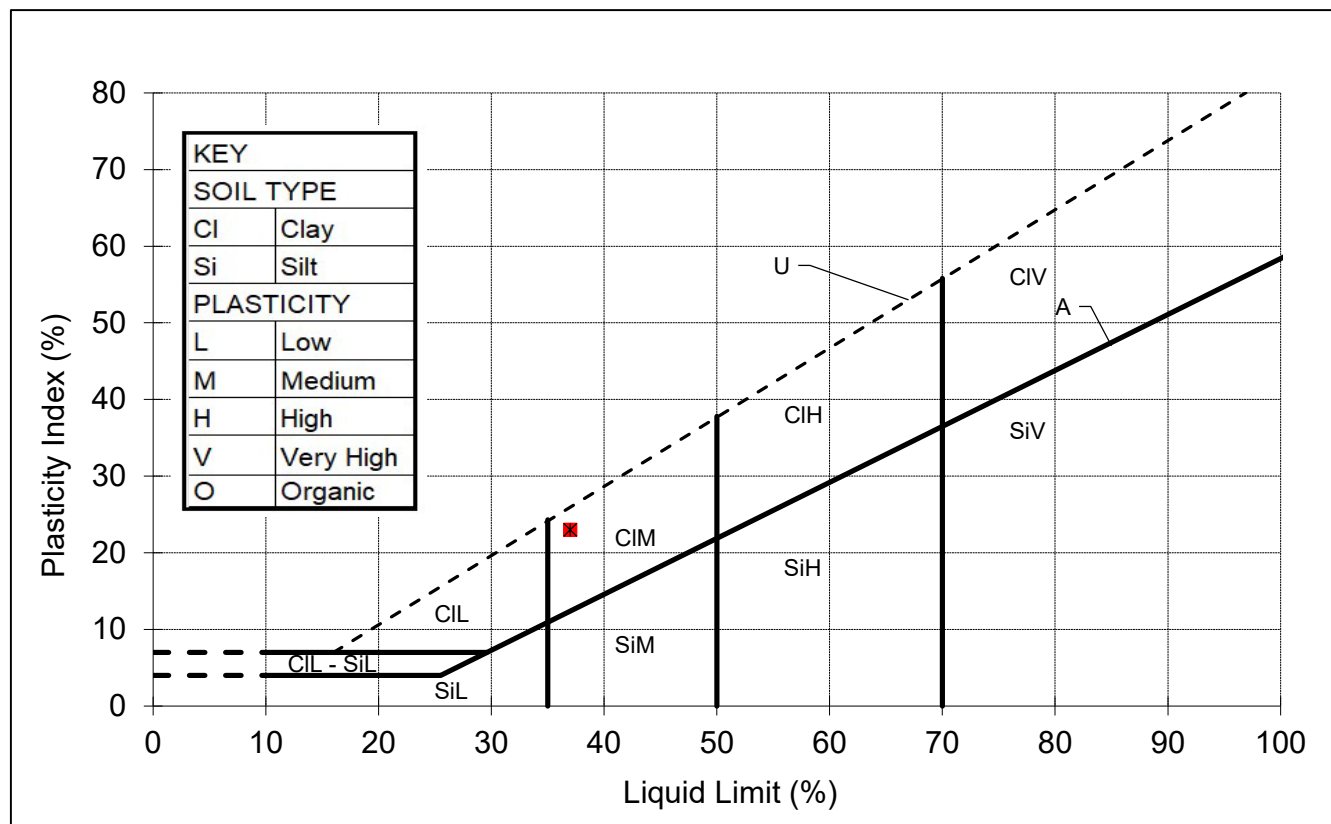
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS105 2.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062804	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17.6	37	14	23	94



REMARKS

SIGNED

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

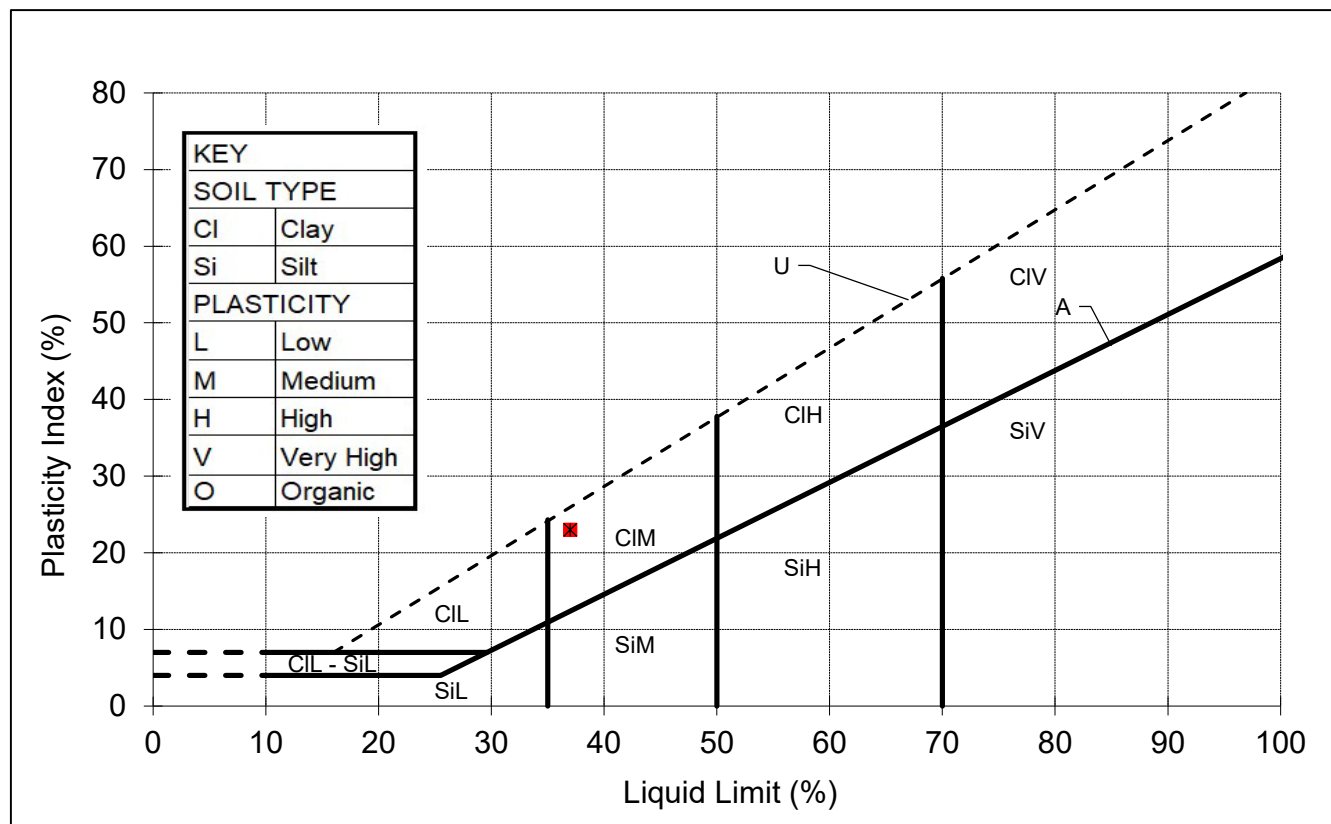
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS107 4.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062805	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17.6	37	14	23	94



REMARKS

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NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

30-Apr-26

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LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

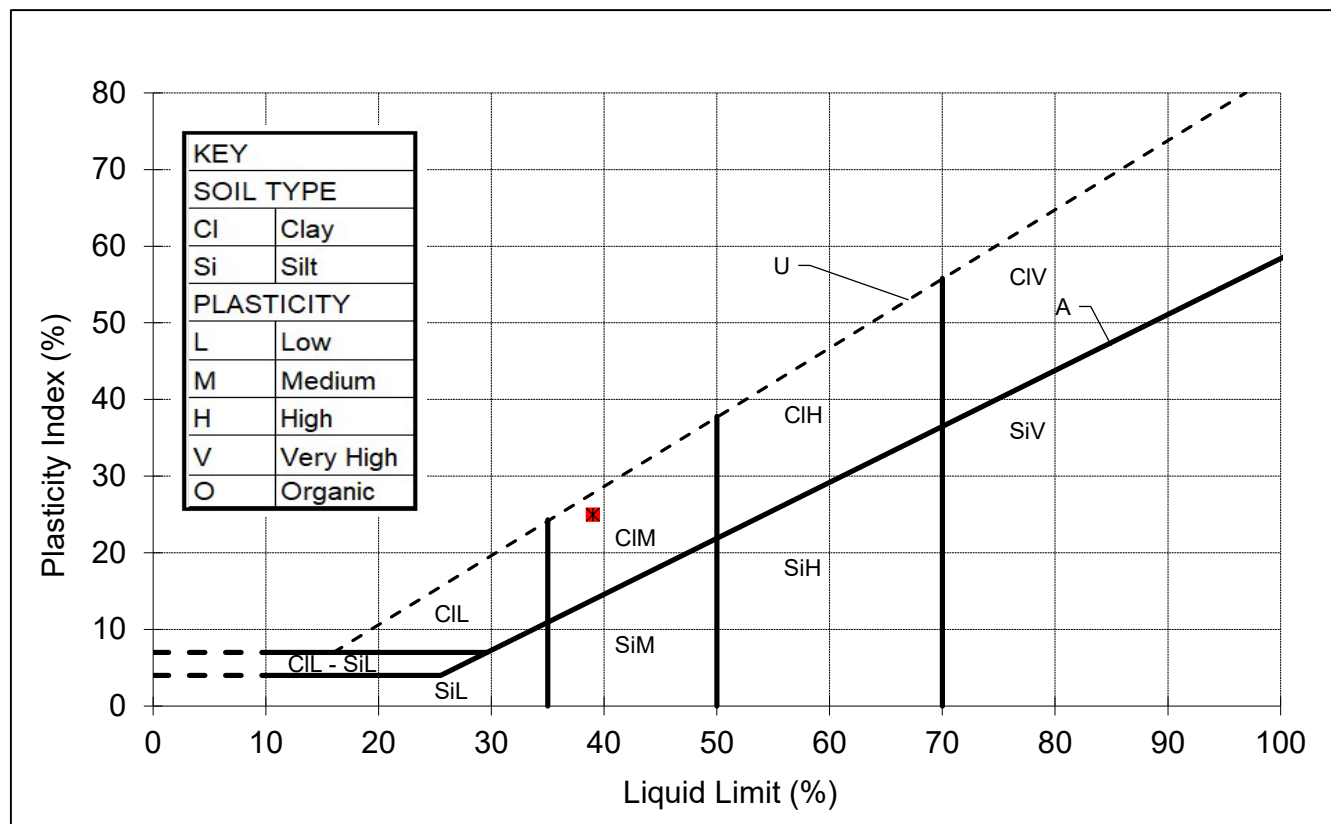
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS108 2.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062806	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Yellowish grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19.3	39	14	25	93



REMARKS

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O.P. Davies BA (Hons)
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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

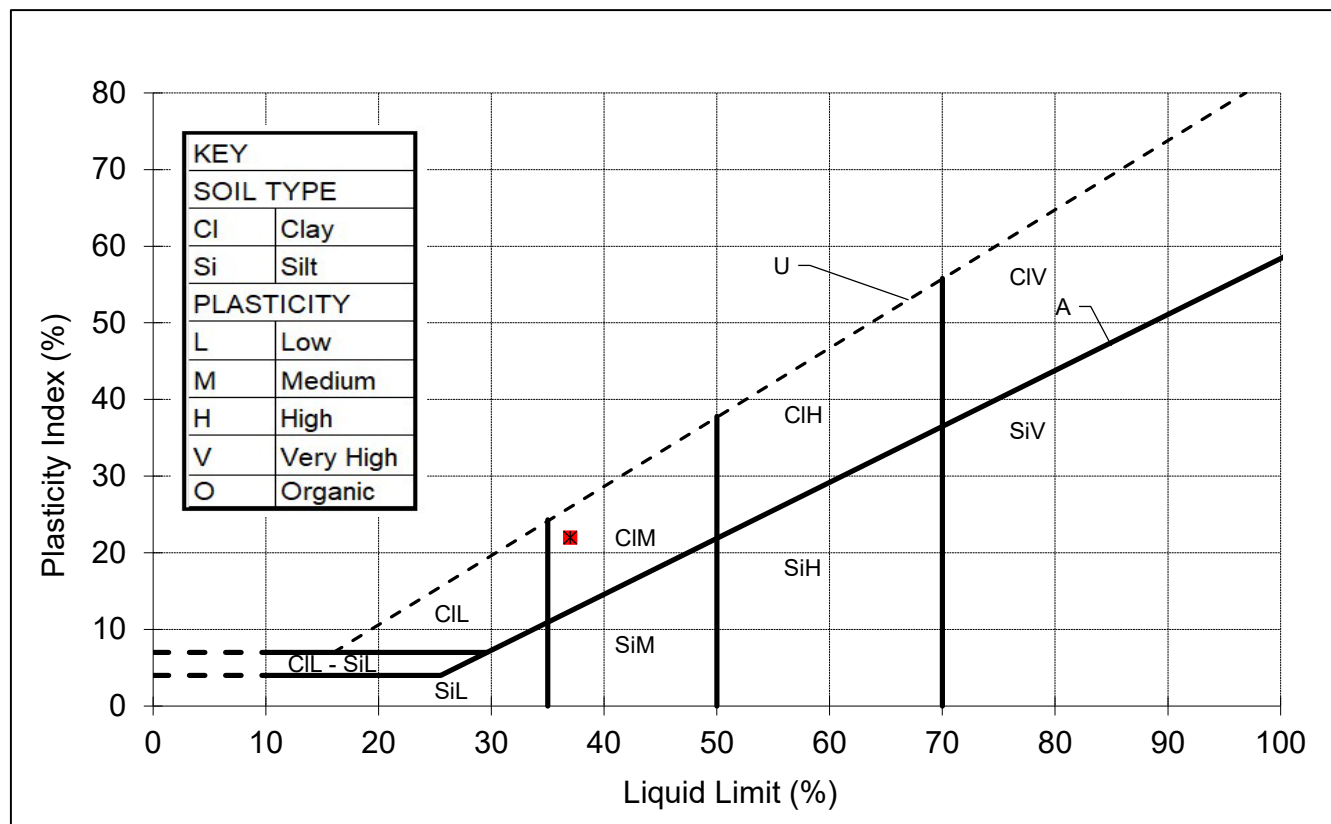
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS111 1.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062807	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Reddish brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15.7	37	15	22	93



REMARKS

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O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

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LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 4 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

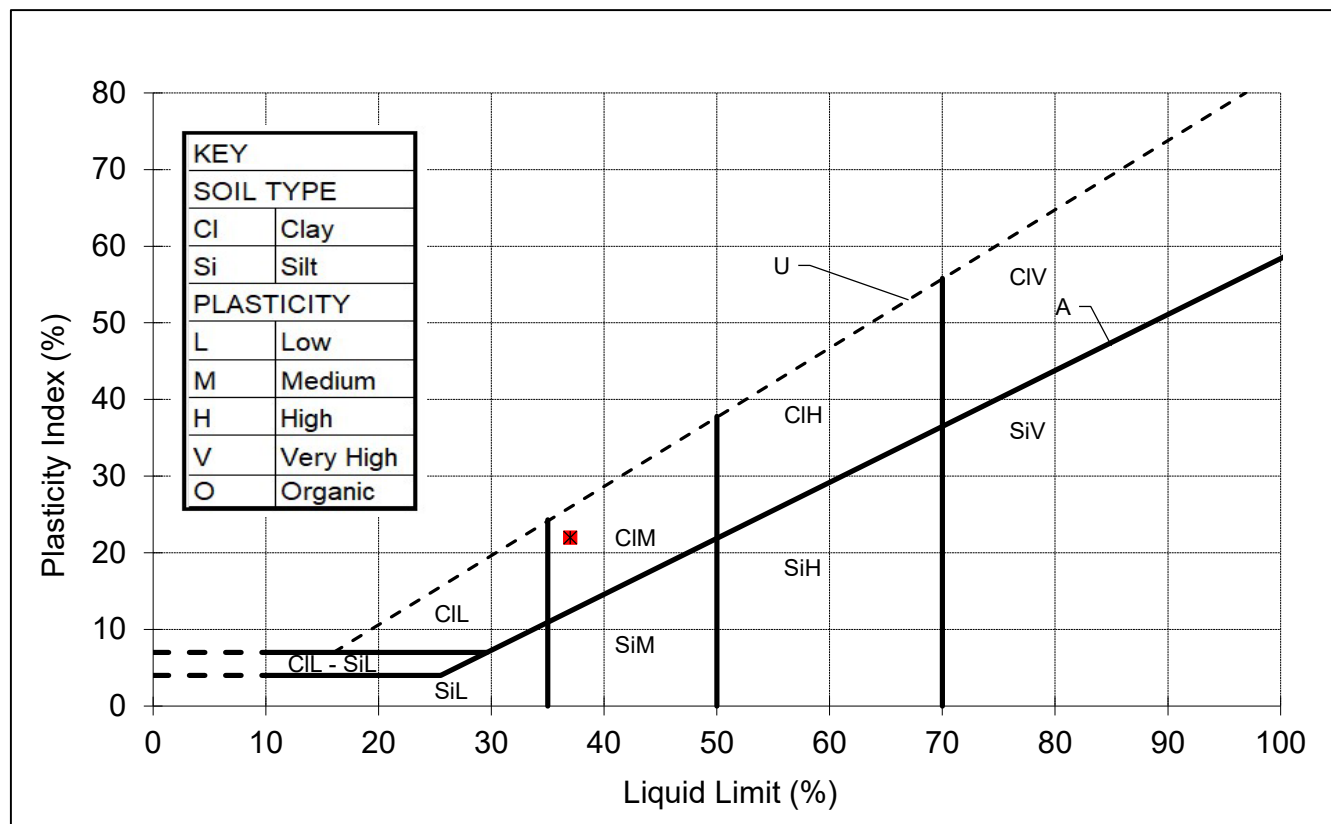
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS112 1.0m	DATE SAMPLED	17-Mar-2026
SAMPLE No.	6062808	DATE RECEIVED	25-Mar-2026
DATE TESTED	30-Mar-2026	SAMPLED BY	Client

MATERIAL	Orange grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	Air dried	% RET. 425um BY	Wet sieved

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.0	37	15	22	96



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE 30-Apr-26

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

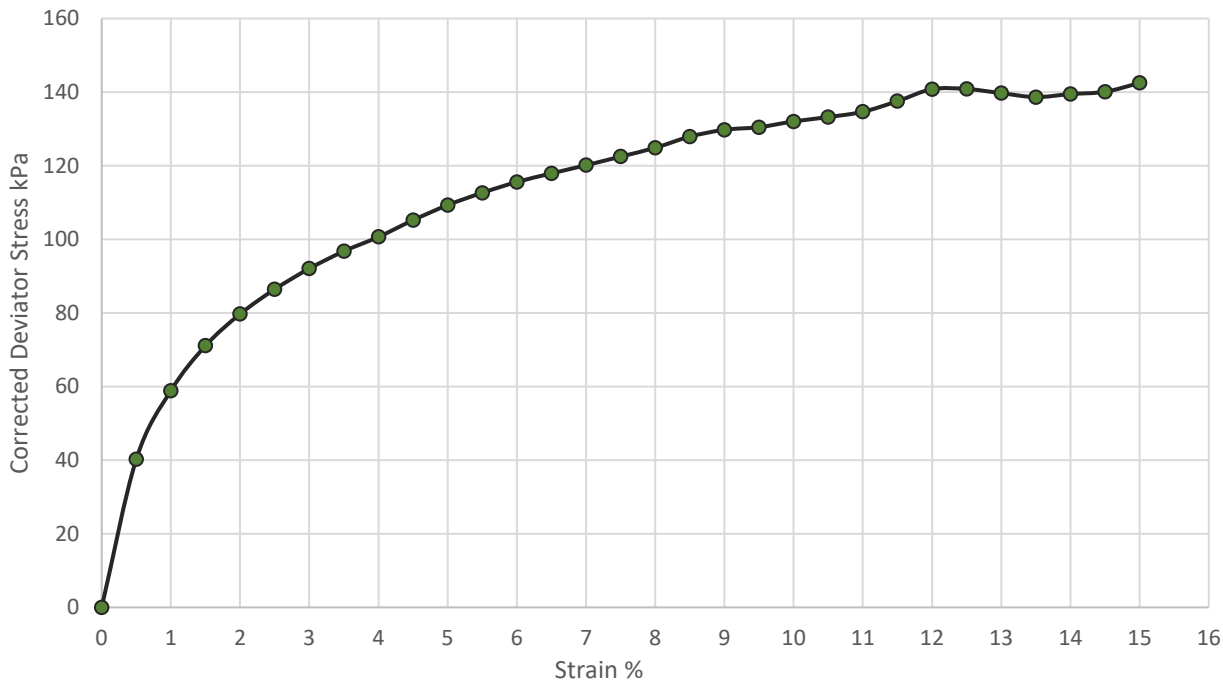
CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS101 2.5-3.0m	DATE SAMPLED	17-Mar-26
LAB SAMPLE No.	6062809	DATE RECEIVED	25-Mar-26
DATE TESTED	01-Apr-26	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

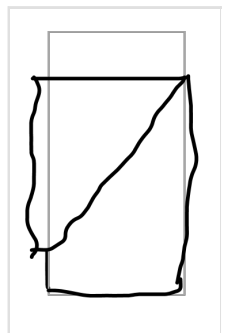
Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	144	Specimen Water Content (%)	15.4
		Specimen Diameter (mm)	72	Specimen Bulk Density (Mg/m3)	2.23
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.93
		Membrane Correction	3.40		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



SIMPLE_SHEAR

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
55	15.0	2.0	142	71

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 30 April 2026

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

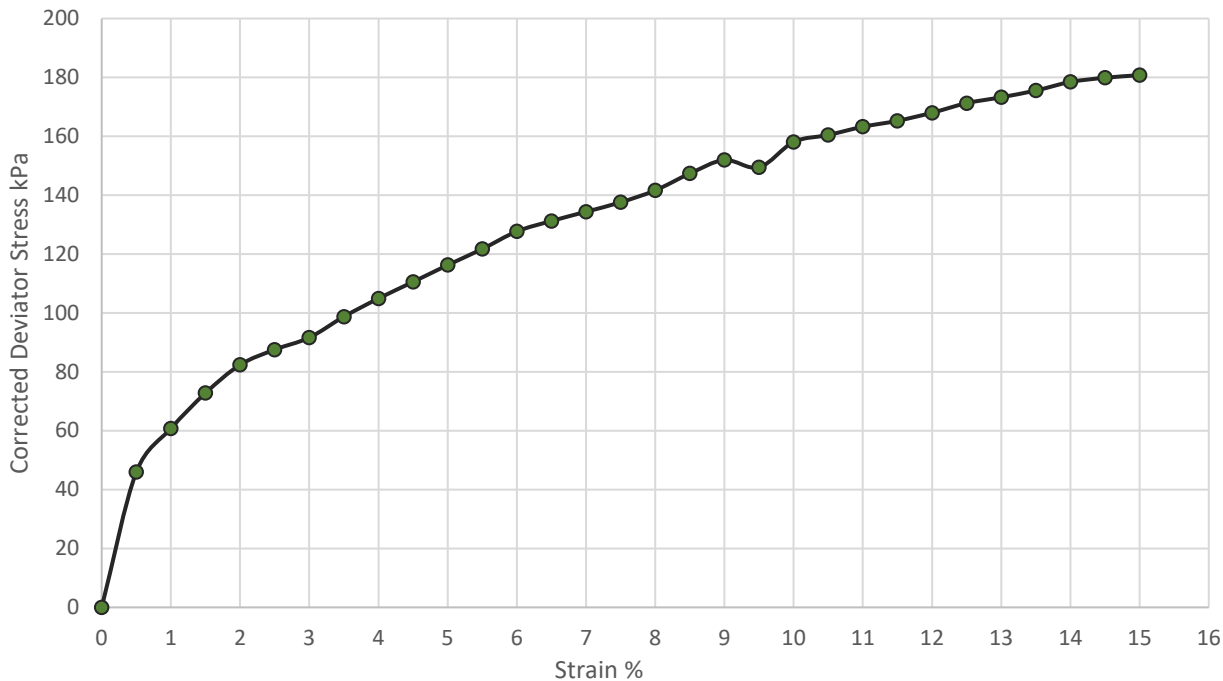
CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS103 2.5-3.0m	DATE SAMPLED	17-Mar-26
LAB SAMPLE No.	6062810	DATE RECEIVED	25-Mar-26
DATE TESTED	01-Apr-26	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

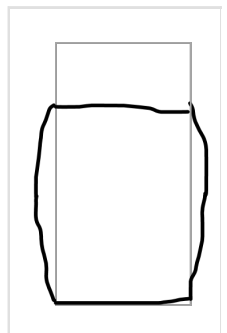
Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	140	Specimen Water Content (%)	15.9
		Specimen Diameter (mm)	73	Specimen Bulk Density (Mg/m3)	2.19
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.89
		Membrane Correction	3.40		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
110	15.0	2.0	181	90

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 30 April 2026

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

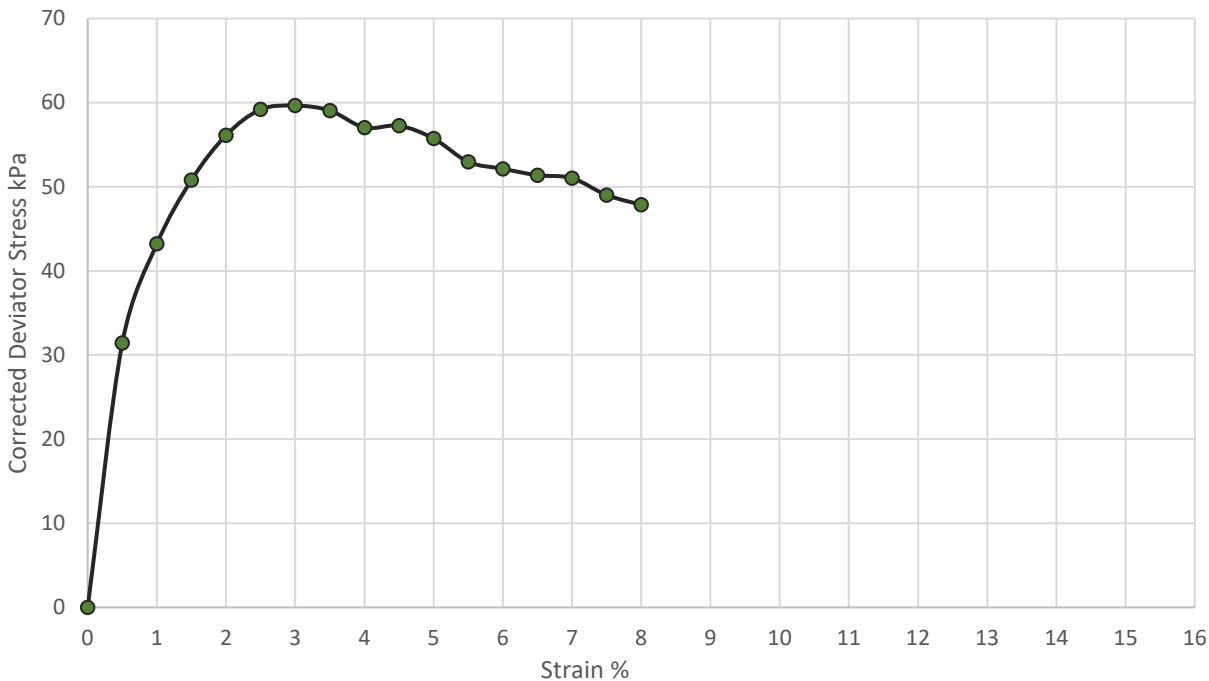
CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS108 4.5-5.0m	DATE SAMPLED	17-Mar-26
LAB SAMPLE No.	6062812	DATE RECEIVED	25-Mar-26
DATE TESTED	01-Apr-26	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

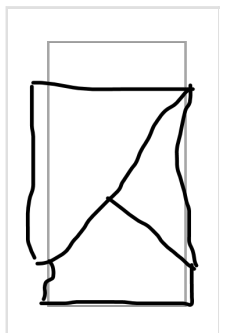
Specimen Location 	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	126	Specimen Water Content (%)	20.0
	Specimen Diameter (mm)	64	Specimen Bulk Density (Mg/m3)	2.07
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.72
	Membrane Correction	1.74		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



COMPLEX_SHEAR

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
95	3.0	2.0	60	30

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed



Date 30 April 2026

MURRAY RIX

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TEL 0161 475 0870



TEST CERTIFICATE

INCREMENTAL LOADING OEDOMETER TEST
BS EN ISO 17892-5:2017

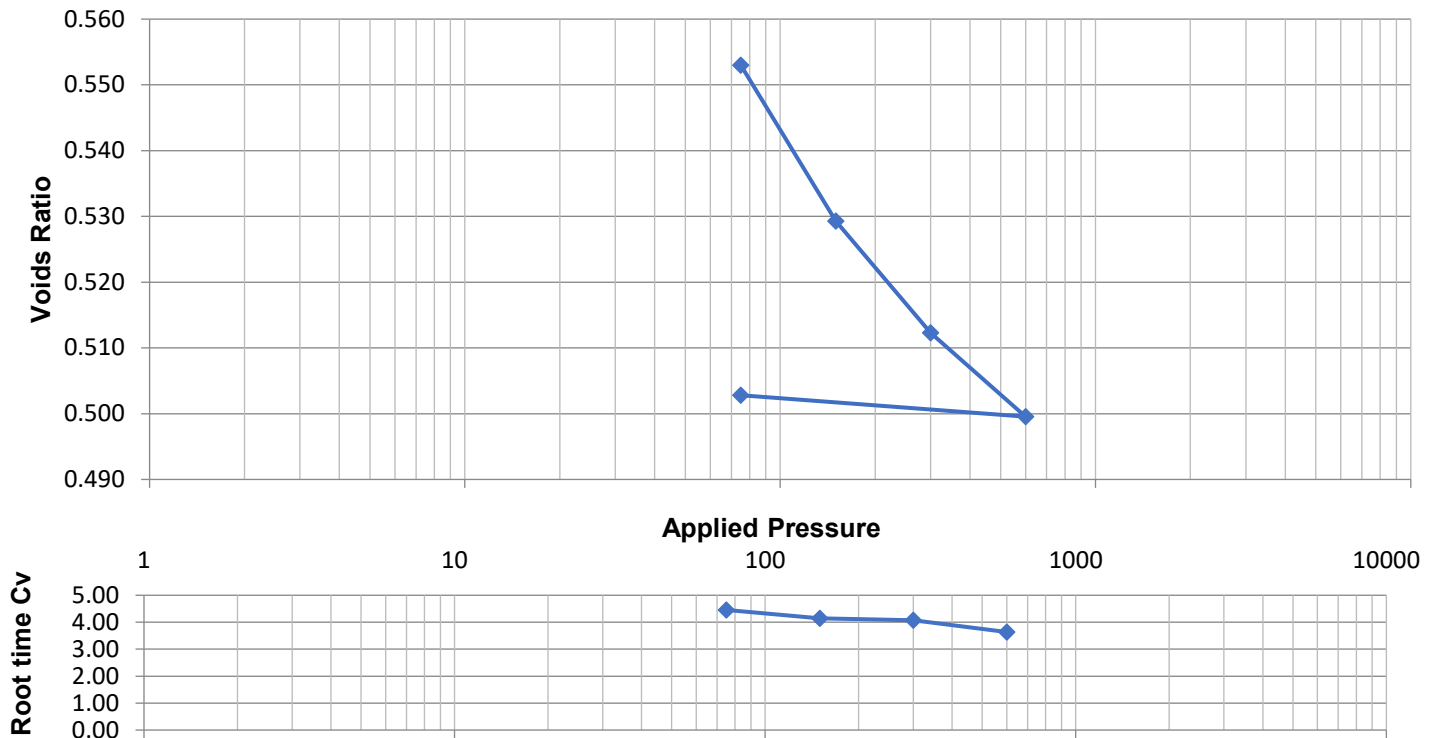
CLIENT	e3p
SITE	Wilson Road, Huyton, Liverpool L36 6AE
JOB NUMBER	MRN 26002/140

SAMPLE LABEL	WS107 3.5-4.0m	DATE SAMPLED	17-Mar-26
LAB SAMPLE No.	6062811	DATE RECEIVED	25-Mar-26
DATE TESTED	01-Apr-26	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		
PRE-TREATMENT	Undisturbed		

Specimen Location	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	55
	Sample Orientation	Vertical		

					Load No.	Applied Pressure kPa	Specimen Height mm	Void Ratio	Mv m ² /MN	Temp °C	Cv t90 root m ² /yr	Cv t50 log m ² /yr	
INITIAL CONDITIONS													
Height	20.1	mm	Particle density	2.65	Assumed	1	75	19.73	0.553	0.24	20	4.46	5.38
Diameter	50.1	mm	Initial void ratio	0.58		2	150	19.43	0.529	0.20	20	4.14	4.86
Weight wet	79.9	g	Deg. of sat.	92	%	3	300	19.22	0.512	0.07	20	4.07	3.86
Water cont.*	20.3	%	Swell. press.	3	kPa	4	600	19.05	0.500	0.03	20	3.64	4.04
Bulk Density	2.02	Mg/m ³	Dry density	1.68	Mg/m ³	5	75	19.10	0.503	0.00	20		
* determined from specimen trimmings						6							
						7							

* determined from specimen trimmings



Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 30-Apr-26

Appendix IX: Origin of Chemical Assessment Criteria





CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	PROVISIONAL C4SL
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Sutable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene (iii)	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C5-C6 (aliphatic)	
TPH C6-C8 (aliphatic)	
TPH C8-C10 (aliphatic)	
TPH C10-C12 (aliphatic)	
TPH C21-C35 (aromatic)	